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Science of Gymnastics Journal (ScGYM®)

Science of Gymnastics Journal (ScGYM®) is an international journal that provide a wide range of scientific information specific to gymnastics. The journal is publishing both empirical and theoretical contributions related to gymnastics from the natural, social and human sciences. It is aimed at enhancing gymnastics knowledge (theoretical and practical) based on research and scientific methodology. We welcome articles concerned with performance analysis, judges' analysis, biomechanical analysis of gymnastics elements, medical analysis in gymnastics, pedagogical analysis related to gymnastics, biographies of important gymnastics personalities and other historical analysis, social aspects of gymnastics, motor learning and motor control in gymnastics, methodology of learning gymnastics elements, etc. Manuscripts based on quality research and comprehensive research reviews will also be considered for publication. The journal welcomes papers from all types of research paradigms.

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CONTENTS

Ivan Čuk	**EDITORIAL**	**3**
Anton Gajdoš **Maria Provaznikova** **Stephen J. Banjak**	**150 YEARS OF THE SOKOL GYMNASTICS IN CZECHOSLOVAKIA, CZECH AND SLOVAK REPUBLIC**	**5**
Myrian Nunomura **Yoshinori Okade** **Paulo Carrara**	**HOW MUCH ARTISTIC GYMNASTICS COACHES KNOW ABOUT THEIR GYMNASTS' MOTIVATION**	**23**
Fernanda Faggiani **Allistair P. McRobert** **Zoe Knowles**	**DEVELOPING PRE-PERFORMANCE ROUTINES FOR ACROBATIC GYMNASTICS: A CASE STUDY WITH A YOUTH TUMBLING GYMNAST**	**35**
Proios Miltiadis **Mavrovouniotis Fotios** **Proios Michalis**	**PROPOSAL OF PSYCHOLOGICAL PREPARATION IN ARTISTIC GYMNASTICS**	**49**
Mateja Kunješić	**PARENT'S EXPECTATIONS TOWARDS CHILDREN'S ARTISTIC GYMNASTICS EXERCISE**	**61**
Bessem Mkaouer **Samiha Amara** **Zouhair Tabka**	**SPLIT LEAP WITH AND WITHOUT BALL PERFORMANCE FACTORS IN RHYTHMIC GYMNASTICS**	**71**
	SLOVENSKI IZVLEČKI / SLOVENE ABSTRACTS	**78**

III INTERNATIONAL SEMINAR ON COMPETITIVE ARTISTIC AND RHYTHMIC GYMNASTICS - SIGARC 2012

FIRST INFORMATION

Dear Gymnastics researchers, athletes, coaches and judges,

We are pleased to invite everyone to participate in the 3rd SIGARC – *INTERNATIONAL COMPETITIVE ARTISTIC AND RHYTHMIC GYMNASTICS,* to be held on October 5 and 6, 2012 in Rio Claro (Sao Paulo – Brazil), at the São Paulo State University (UNESP). The schedule and program, the submission guidelines and other relevant information will be available by February 2012.

Sincerely,

Organizing Committee.

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EDITORIAL

Dear friends,

Last issue made a huge interest among readers, more than 7000 visitors at our Journal web site proves our researchers around the world are doing the right stuff, which is in your field of interest.

The most important aim of our journal is to spread knowledge and also our friends from Brazilia have same idea. Please do not forget between **5th and 6th October 2012** in **Rio Claro** (Sao Paulo State University, Brasilia) will be organized **3rd International Seminar on Artistic and Rhythmic Competitive Gymnastics**. You have still time to join them and also test what can you expect at Olympic Games 2016. More information you can find at next page.

At Faculty of Sport, University of Ljubljana, we are organizing S**ymposium Youth Sport 2012**, the programme can be found at http://www.youthsport.si/.

Slavic nations are celebrating 150 years of Sokol gymnastics in their countries. The first Sokol club started in Praque in 1862 and more about Czech and Slovak gymnastics you can find in the first article written by well known Professor Ph.D Anton Gajdoš with Maria Provaznikova. It is worth to note another Anton Gajdoš idea of preparing National encyklopedy of Sport in Slovakia - from 1840 till present time www.sportency.sk.

The second article is from Myrian Nunomura (Brazila); Yoshinori Okade (Japan); Paulo Carrara(Brazilia) and covers very interesting topics – how much coaches know about gymnasts motivation, or better where is their lack of knowledge.

The third article comes from United Kingdom. Authors Fernanda Faggiani, Allistair P. McRobert and Zoe Knowles prepared article with title Developing pre-performance routines for acrobatic gymnastics: A case study with a youth tumbling gymnast, it is the first article dealing with acrobatics, but their experience can be used in any gymnastics sport.

The Greek authors Proios Miltiadis, Mavrovouniotis Fotios, and Proios Michalis are rounding psychological topics in this issue with review article titled Propolsal of psychological preparation in artistic gymnastics. Important topics for coaches to what they should be also focused beside the technical training.

The fifth article is from Croatia young researcher Mateja Kunješić, she was researching what are parents expectations for their children exercising gymnastics. It is worth to note, despite injuries in high performance gymnastics, the main reason is child health, competitions are not important by itself and even more surprisingly, there is no differences between mothers and fathers.

The last article comes from Tunisians Bessem Mkaouer, Samiha Amara and Zouhair Tabka. They made a biomechanical analysis of split leap with and without ball throw-catch. With task to throw and catch the ball the biomechanic parameters of split leap change significantly. It is a matter of motor control and article brings us inside of which parameters we are changing to catch ball.

I wish you pleasant reading and a lot of inspiration, for preparing new researches and articles,

Ivan Čuk
Editor-in-Chief

University *of Ljubljana*
Faculty *of Sport*

Youth Sport 2012

6th Conference for Youth Sport
University of Ljubljana, Faculty of Sport

6 December - 9 December, 2012
Bled, Slovenia

150 YEARS OF THE SOKOL GYMNASTICS IN CZECHOSLOVAKIA, CZECH AND SLOVAK REPUBLIC

Anton Gajdoš, Maria Provaznikova and Stephen J. Banjak

Bratislava, Slovakia

Original research article

Abstract

Gymnastics in Slavic countries started in 1862 with Sokol club in Prague. Leader Miroslav Tyrš made strong organisation within Austro Hungary imperia, which competed also at Olympic Games under Bohemia name. After World War I Czech and Slovak nations joint in new state Czechoslovakia. Time between world wars was most succesfull time with many gold medals at Olympic games and Word Championships. After the second world war communist party took a leading role in gymnastics development with highlight on women side; Vera Caslavska is the best athlete of this time. After velvet revolution Czechoslovakia split into two countries Czech and Slovakia. Gymnastics tradition continues again under Sokol brand name.

Keywords: *history, gymnastics, Czech, Slovakia.*

Period 1862 - 1918

One hundered and fifty years ago, on February 16, 1862, the „Prague Gymnastic Unit“ came into being at the Prague Normal School, located then on Panska Street, Bohemia.

At first it appeared that this would become a bilingual, Czech-German organization. At least these were the intentions of the gymnasts at the Schmidt Gymnastics Institute, which was then very close to extinction. The only reason the planned bi-lingual club did not materialize was the opposition of the chauvinist German bank director Seutter von Leutzen. This philanthropist refused bluntly to contribute to a Czech-German organization. The Germans, therefore, cancelled their agreement which the Czechs, who withdrew their subscriptions and decided to establish an independent Czech Gymnastic Club.

The thirty-year-old Dr. Miroslav Tyrs readily joined the movement. He saw in this a clear path towards the realization of a far more important idea, which had been germinating for some time in his mind.

All this took place during the wave of youthful patriotic bustle that spread throughout the Czech nation following the demise of Bach´s absolutism. Tyrs was at this particular time employed as tutor in the family of industrialist Bartelmus in New Jachymov. At this time in history the National Rebirth was almost accomplished linguistically, artistically, scientifically, economically, and socially. But this did not satisfy young Tyrs. He was constantly being disturbed by the question about his nation´s future.

In his philosophic studies he was deeply involved in Darwin´s theory of the evolution of the species and the survival of the fittest.

In his studies in history he was deeply concerned with the question of the destruction of ancient nations. To him, the history of mankind is an eternal struggle for survival to which must succumb and perish all that is unfit to live and through its own fault. In support of this theory Tyrs pointed to the ancient Greeks who preserved their independence against tremendous odds, only by their physical fitness, spiritual maturity and moral qualities, closely associated with boundless love of country and liberty.

This was the model Tyrs wanted for his country. He wanted to give it the spiritual and moral maturity, which would secure its

Figure 1. Miroslav Tyrš in Sokol uniform

future. The nation´s renaissance was already secure in all fields of human endeavor. But it lacked physical excellence, the necessary basis for fighting power, together with organizational aility, respect for discipline and cooperation and the ability to set aside individual interests to the interests of the entire nation. Through his experience in the various gymnastic institutes he realized that physical exercise does not affect merely one´s physical well being, but in the hands of good instructors, it can affect the development of one´ s character and social attitudes. For this reason, Tyrs selected gymnastics as the means for training the nation in the very qualities necessary for its preservation and complete fulfillment.

In this line of thinking Tyrs found exceptional understanding in a truly rare man he had met in the Bartelmus family circle. This was Jindrich Fugner, a Prague Merchant, who used to spend his summer vacations in a gamekeeper´s lodge not far from Jachymov. This noble, broad minded man and convinced demorat, in spite of his German upbringing, was well aware of the excellence of the Czech nation and he felt the injustice it suffered under the Austrian yoke. Thus the efforts of the two men met on a common ground. Fugner agreed readily with plans advanced by Tyrs.

They both returned to Prague in the fall of 1861 just at the time when plans were being considered for the formation of a Czech Gymnastic Organization. The two men reached an agreement with Dr. Edward Gregr and Professor Emanuel Tonner, and with their well thought out program they quickly assumed the leadership of the new organization. The most outstanding chracteristics of the organization from its very inception was the democratic spirit insisted uupon, especially, by Fugner. The spirit of equality, expressed in the use of addressing each other as „brother“, attracted participants from the broadest strata of contemporary life. In conjunction with its high, lofty aims, it turned quickly into a nation widde movement. At Professor Tonner´s suggestion this movement was named „Sokol“ (Falcon) and the falcon in flight on its banner became the symbol of high flight and courage.

If the Sokol were to bring forth physical, spiritual and moral uplifting of the nation, it would have to involve the natioon as a whole, not only a limited segment. The unity of the nation, the entire nation, of all its levels and strata was the inescapable condition towards reaching the goal.

Fugner declared emphatically: „Let us be a society of united brothers, not divided

by political differences of religion," a declaration that became law among the Sokols.

The Sokol idea quickly burst into a mighty flame that spread across the nation´s physical boundaries. One year after its birth in Prague there was a Sokol unit in Ljublania. In just three years, in the year of Fugner´s death, there were twenty active units in Bohemia and Moravia, with 200 members, and Sokol units were established among the Slovenes and in America. These were followed by Poland, Croatia and Serbia. By the years 1871 there were 120 units with 11.000 members. To Tyrs a nation is not just its men. „There is no universal all embracing patriotism, and woe to the nation where manly endeavors are not appreciated by its women". „This led Tyrs to initiate and help establish in 1869 the „Gymnastic Society of Women and Girls of Prague", an organization that conveyed the Sokol idea to the women.

The rapid growth of the new movement aroused the suspicion of the Austrian government who saw in it the center for „subversive elements." They even forbade the Prague Sokol from extending its physical education classes to units outside of Prague. It was not until after Tyrs´ death that it was permitted to combine several units into districts which later became the Czech-Moravian Sokol Community. It was not until 1906 that all the several districts together with the Lower Austria district formed the only Czech Sokol Community.

All of Tyrs´ efforts were directed to one culminating goal, namely, the placing of the nation amidst other free nations as equal among equals. At the beginning he had faith in the possibility of realizing this project within the framework of a federated Austri, a belief shared at that time by most leading Czech politicians.

But soon Tyrs himself became negative towards Austria and began to plan the Czech nation´ s preparation for its independence. Tyrs´ successors accepted this position as the founder´s legacy, nurtured it among the Sokols and continued to prepare for the struggle which was not yet in sight, but which seemed to all of them unavoidable. Their attitude towards the authorities was characterized by proud defiance.

The Sokol Slets speak clearly, unmistakenly both in the ostentatious fraternalizing with visitors from counteries openly unfriendly towards Austria as well as in the underlying significance of the elaborate scenes prepared for each Slet. Thus the subject of the Fifth Slet in 1907 was a scene depicting Zizka´s victory against King Sigismund in the battle near Kutna Hora. Then at the Sixth Slet in 1912 the colorful scene depicted the victory of the Athenians against the superiority of the Persians at the Battle of Marathon. In both these scenes the nation was given an opportunity to witness the victory of a small but morally strong nation against a numerically far superior enemy.

Following the Sixth Slet the internal preparations assumed the character of direct preparations for revolt. The author of the play „After the Battle of Marathon" declared in his poem „The Sound of the Olympic", that everything the viewers can see is merely a preparation for the early conquering of our own Czech Marathon. He explained that the nation is merely looking up toward the accumulated black storm clouds with the question „When"?.

It was under this emotional mood that the last review of the Sokol strenghts was held in Brno in June 1914. Pluhar, the deputy governor, declared in his ceremonial address that the Czech nation understood the deeper mission of the Sokol in serving the nation´ s battle of the past hundreds of years. He reiterated that the nation has decided to once again assume the position it had held in the past, that it now had a strong arm with which to break all violence and the strong will which will guide this arm. That was the Sokol. Pluhar´s conclusions sounded that challenge: „We are here once again, and we want to be unfettered, powerful and free." Just a few hours after the bold declaration came the shattering news about the Sarajevo assassination; the First World War would begin!

Professor T.G.Masaryk was well aware of the Sokol thinking while contemplating the struggle against Austria. His first step led him to Dr. Scheiner, president of the Czech Sokol Organization, and he declared, „I am thinking first of all with the Sokols. I know them and am depending on them.“ In response to this Dr. Scheiner offered immediately the total assistance of all Sokols, and even some of his and the Sokol´s monetary funds. Later in his memoirs Masaryk recalled thta this offer was the first monetary contribution to the resistance.

The Sokol and the Sokol ideal were expressed most convincingly in the formation of the legions. The first such voluntary unit as the „Na Zdar“ company with members of the Paris Sokols forming its core. The Sokol gave the legions their spirit. Masaryk himself testifies to this saying, „In addition to the Hussite and Taborite traditions, it was the Sokol ideal that led us on, the Sokol discipline and order which the individuals knew so well and to which they yielded so readily and which became their second nature. This Sokol spirit penetrated into the victorious army.“

Period 1918 - 1939

Then came October 28, 1918. All through the streets of Prague the people were singing, rejoicing, but in all this exulting multitude the Sokols were conspicuously absent. They had been called together in the early forenoon by urgent posters in order to complete the victory on the home ground and to protect it. It must be remembered that at this momentin history Prague was still militarily in the hands of the Austrian generals and their faithful Rumanian regiments. The most difficult part of the revolutionary action, the taking over of military power, was entrusted by the National Council to Dr. Scheiner. Wearing his Sokol uniform and accompanied by Dr. Francis Soukup and several other brothers, Dr. Scheiner went directly to the headquarters of the territorial military command on the Mala Strana to negotiate the takeover. At first the generals hesitated to surrender the control but when they saw that in the meantime other Sokols entered the building, flooding its courtyard and the halls with their red shirts they realized the inevitableness of the situation and yielded to the demands. Simultaneously other Sokol groups occupied the Prauge armories and began disarming the Rumanian soldiers. Similar actions were taking place in the garrisons in other cities. All over the land the Sokols with virtually bare hands were disarming entire enemy regiments – and this was not always so smooth and without resistance.

Who knows if the revolution could have taken place so smoothly and without losses of life and property if there were not present the nation´s mighty arms, referred to by Dr. Pluhar at the Sokol Slet in Brno. The Sokols formed sentry guard units that watched over order in the nation and over national property. Within three or four days after the transition the entire national property was in the hands of the Sokol Community. Practically the entire executive power of the National Council was transferred to the Sokols.

Since it was evident that organizing a regular army would require quite a bit of time, the Czech Sokol Community offered to the National Council for the interim period, the formation of voluntary Sokol regiments to be called Guards of Freedom. The National Council accepted this offer very gratefully and the Sokols were further joined by the students, the Czech Marksmanship Organization and the Workers Gymnastic Units. The Guards of Freedom were originally intended to merely serve to maintain order but in Slovakia they had to perform actual military duties. Asi s well known, there the changeover did not go along as smoothly as in the historic Czech lands. The Magyars were reluctanct to give up Slovakia and this had to be fought for from city to city, from one garrison to another.

Before the Slovak government was established the resistance of the Magyars and the German assumed exceptionally

threatening proportions in Bratislava. Zoch, the district administrator and other leaders appealed by urgent telegrams on February 2, 1919 addressed to the Czech Sokol Community asking that 2.000 Sokols be sent to Bratislava without delay to help maintain order. A simple appeal through the daily press was sufficient, and within 36 hours 2.480 Sokols in uniform arrived in Bratislava. Their very presence prevented bloodshed and was sufficient to assure peaceful takeover by the new government.

But even this did not end the Sokol role as national army. In June of 1919 the Magyar communists invaded Slovakia and occupied a number of cities. Once again the pro-tem government in Bratislava asked th eSokols for help. And once again, within two days after the telegraphed request, the first division of Sokol volunteers was on their way from Prague to Slovakia. The Sokol Organization ordered immediate draft and 86.000 Sokols responded. Of these 10.000 were sent to Slovakia – thus, thanks to the Sokol assistance the advance of Magyar communists was halted and Bratislava was saved.

Conditions in the Republic were far from ideal. It was not only the legionaires who returned to their homes, but also the communists trained by the Russian Bolshevik revolution with their plans for Bolsehvism in the young state. In this they were aided by the initial difficulties facing the government, which could not create order out of chaos in one day. Furthermore there were the problems of providing food and Essentials in a country exhausted and depleted by war. The communists eagerly fed the people´s dissatisfaction with the slow pace of improvement as they kept harassing and inciting the workers, and organized frequent demonstrations and marches.

It was under such conditions that the Sokols were making preparations for their Seventh Slet, the first in their liberated country. But before the Slet could actually be realized, the Prague Sokols had to face the communist threat to do everything to prevent the holding of the Slet. There was genuine fear that the fanatic communists might undercut the columns supporting the grandstands or even set them on fire.

At a time when all other succession government in Europe were struggling with economic poverty and internal confusion, in the Czechoslovak Republic, just one year and eight months old, the Sokols staged a Slet which attracted the attention and admiration of the outside world. However, its greatest significancy was the affect it had right at home. The Slet stirred the nation´ sconscience, it jarred it from its depression and woke in it, decision and efficient will. It showed clearly that only courage and hard work could leave the nation from the post war difficulties and save it from the dangers of communists.

The most important role in the internal structure of the Sokol after the first World War was the expansion of Sokol activity to Slovakia and Ruthenia. The original name of the organization was changed to Czechoslovak Sokol Community. In the days of Austria-Hungary the Sokol was not allowed to exist there and several attempts at establishing an organization were foiled at the very inception. Many Slovaks would join the Sokol during their student year in other parts of the historic lands of Bohemia and Moravia, and would, at great risk, secretly travel to the Slets in Prague. The American Slovaks had begun the organizing of Sokol units since 1892, forerunner of Sokol USA. It is understandable therefore that after the revolution Sokol began to spread rapidly throughout Slovakia. The units were being established simultaneously with the advance of the Guard of Freedom, replacing the Hungarian garrisons. The first unit was created one week after the Prague revolt, November 4, 1918, in the Masaryk Sokol District intended to cover all Slovakia. However, by October of the same year, it was necessary to break up into six separate districts which were joined later by the Ruthenian Sokol District.

After World War I, after formation of the Czechoslovak Republic /1918/ in that time , there have been big stream of Czech civil servants, teachers and others who

spread thoughts espesially of the Sokol´s movement in Slovakia. As early as in 1918 in Uhorskej Skalici /Hungarian Skalica/ came into existence first organized Sokol´s choir.The Sokol´s movement has been spread namely due to the Slovak patriots such as there were Mr. Vavro Šrobar, Pavel Blaho, Kornel Stodola, Samuel Zoch and others.

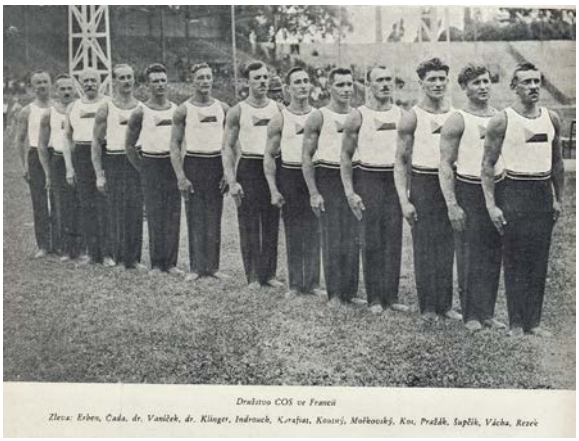
At the beginning of the year 1919, there have been united 39 Sokol´s associations into so called Masarykovej župy /hereinafter county/ Masaryk´s County. Its mayor became Mr. Vavro Šrobar. At the end of the year 1919 County has been devided into 6 Counties namely:

Považska župa Štefanikova /residence Nove Mesto nad Váhom, let us say Trenčín/, Bratislavska župa Masarykova /residence Bratislava/, Nitrianska župa Svatoplukova /residence Nitra/, Podtatranska župa Hviezdoslavova /residence Martin/, Pohronska župa Detvan /residence Banska Bystrica/ and Východoslovenska župa Jana Kollara /residence Košice/. These Counties already existed until the year 1938. Number of Sokol members in Slovakia step by step increased when in the year 1920, there have been registered 18 499 members and in the year 1937 there have already been 49 378 members.

Sokol´s members from Slovakia have been regularly taking part at so called „Všesokolských zletoch“ /all Sokol´s jamborees/ in Prague in the years 1920, 1926, 1932 and 1938.

The importance of the Sokol in Slovakia in addition to its physical and moral upbringing was most of a its contribution to the creation of Czechoslovak unity. From the very beginning the Sokol in Slovakia and in the historic lands was solidly one body and soul. There were no organizational divisions, no differences, no special privileges. Constant contact in the instructor´s schools, meetings, Slets and visits supported mutual understanding and served to strengten the units. The Sokol was one of the strongest supporters of Czechoslovak unity.

In 1926 when the contagion of fascism began spread in Europe the Eighth Sokol Slet came in the nick of time to support the democratic strength of the nation.



Družstvo ČOS ve Francii
Zleva: Erben, Čada, dr. Vaníček, dr. Klinger, Indrouch, Kratina, Kousný, Mořkovský, Kos, Pražák, Šuplík, Vácha, Kezeč

Figure 2. Czechoslovakia team at World Championship 1926 in Lyon

The organization grew and became stronger and stronger. In 1932, by its Ninth Slet, the Sokol celebrated the one hundredth birthday of Dr. Miroslav Tyrs. One year after the Ninth Slet Hitler took over in neighboring Germany. The first victim of Nazis was the Luzicky Sokol, which was dissolved immediately after Hitler´s rise to power, and its leading members imprisoned. The Sokol responded to the growing threats from Nazi Germany by increased activity, especially in matters of training for armed and civil defense, both actions carried out in close cooperation with the army. When the Sokol defense units were called together in April 1937 as a review of preparedness and reliability, 530.000 participants responded.

It was such a climate that the Tenth Sokol Slet was being held. The final preparations for the Slet were interrupted by the occupation of Austria by Hitler, the May mobilization and Henlein´s ultimatum. But all this only strenghtened the Sokol determination to express, by the Slet, their will to defend themselves; to defend the freedom and independence of their nation. This Slet expressed the sould of the nation, its faith and its will. For the entire period that followed, the Slet served as a symbol and source of strength. When the conditions were at their worst, when after Munich

agreement (leaving Schlezia to Germany) there was not a single spark of hope, the country was strengthened by the heartwarming memory of the Tenth Slet.

Within less than three months after the Slet came „Munich" and the rape of Czechoslovakia. As a result of this blow, the Sokol lost 548 Units and 3 Districts that disappeared completely, and others that were reduced territorially. The Sokol was completely dissolved in Slovakia.

Period 1939 - 1948

The Nazi occupation of the whole country March 15, 1939 was a signal for the Sokol to begin its underground resistance, which was set in action the very moment that the German troops marched upon Czechoslovak soil. The Sokols had a lion´s share in all the underground activities ranging from the intelligence service for the Czechoslovak government in exile in London to sabotage and to organizing partisan units. At this time the illegal Sokol played a significant role in the national uprising in Slovakia whose political and military leaders were predominantly Sokols.

In spite of all the caution the Sokol underground activity did not escape the attention of the occupation powers who in April 1941 forbade further activities of the Sokol Community. Since the secession of Slovakia the Sokol Community was once again referred to as strictly Czech Sokol. In October of the same year the organization was dissolved, its property (estimated at 2 billion Kc) confiscated and thousands of Sokol members dragged away to the concentration camps.

For three years after the war, to the Eleventh Slet, it ws an uninterrupted struggle against the communist´s efforts to seize control of the Sokol. Profiting by the Nazi experience the communists knew that dissolution would not destroy the Sokol spirit, they chose the opposite approach... to get control of the spirit by infiltration. Furthermore the communists wanted to preserve the Sokol in order to gain its confidence at home and abroad. The means for attaining this goal was to be the unification of all the organizations of sports and physical education, towards which they were working by negotiating as well as resorting to pressure. Simultaneously, however, they were treacherously blocking the revival of the Czechoslovak Sokol Community and by ordering their people to join en masse the Sokol units. Basically the Sokol did not oppose the unification, but under one condition, that such joining be absolutely voluntary and that the new groups not assume merely the Sokol name but the Sokol idea as well. As could have been expected this condition was rejected, especially by the sports groups. After half a year of futile negotiations the Sokols withdrew from the preliminary committee for unification and renewed fully its organization and its activities.

After the renewal of activity there began an avalanche-like tide of applications to the Sokol. The nation saw in the Sokol the only possible dam against the growing communist danger. By the end of 1947 the Sokol recorded one half million members and with the youth groups the organization had a total of more than one million members.

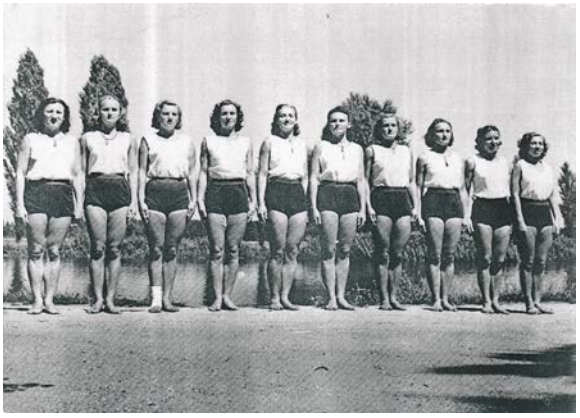


Figure 3. Czechoslovak women team – gold medal OG 1948 London. From left: V.Děkanová - coach, V. Ružičková, J. Srncová, O. Šilhanová, M. Mullerová, E. Misáková, Zd. Honcová, S. Misáková , Zd.Veřmirovská, M. Kovářová

Plans for the Eleventh Slet were being undertaken with new and untrained membership. The enthusiasm for the Slet

exceeded everything known in the past. The Slets had become symbols of freedom, democracy and humanity.

Four months before the Slet the communists carried out their coup. The quickly summoned directorship of the Czechoslovak Sokol Community offered to President Benes the help of the Sokols in defense of democracy, but it was too late. The Sokol delegation was not allowed admission to the President. The various active committees injected into the Sokol by the communist party arbitrarily expelled old Sokol leaders and replace dthese with communists who had nothing in common with the Sokol. Within secret Sokol circles consideration was given to canceling to show the world that „nothing had happened" and that the nation agreed with the new regime, and was cooperating with it in complete harmony. On the other hand, the Sokol leadership wanted to hold the Slet for other reasons. It had become clear that the Slet would be a farewell parting with the Sokol, the last gathering of the Sokol brothers for an unpredictable length of time. The Slet fulfilled this aim and numerically exceeded all previous events. It was a gathering saddened by the sorrow of parting.

Soon after the Slet it was clear that the Sokol had definitely ceased to be a democratic organization and had become a helpless tool of the communist regime. The Sokol members of the directorship, who were still the majority, voted for mass resignation of the entire executive committee, and when this was not adopted they resigned individually with the exception of three members. Then followed mass arrests and the expulsion of thousands of Sokols, whose positions were filled by known communists. After this the government thought that it finally had the Sokol in its hands, but again it was not so. The remaining membership, insofar as they did not step out, began passive resistance. This forced the government to abolish the Sokol organization even merely as a name.

After 1948

After 1948 Czechoslovakia further developed gymnastics, instead of Slets authorities organised Spartakiada. Gymnastics was a national sport with huge results mostly in women gymnastics with Vera Časlavska, with the economic crises in eighties all high performance sport was in decline. In period 1990 – 1993 Czech and Slovak gymnasts competed at WCH and at another international gymnastics competition under Czech republic and Slovakia. In January 1st 1993 Czechoslovakia split and also split Czechoslovak gymnastics federation. So born Slovak gymnastics federation and Czech gymnastics federation.

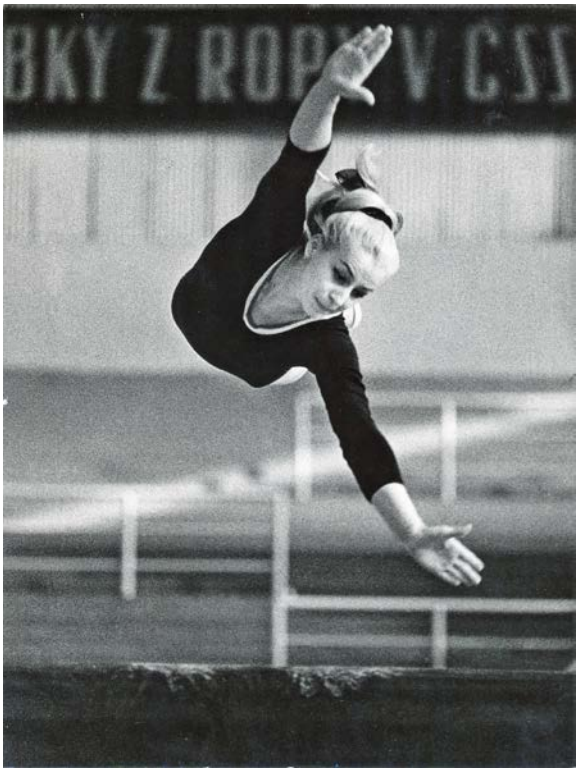


Figure 4. Vera Caslavska

New period for Sokol´s life in Czechoslovakia started after "Velvet revolution" 1989. Czechoslovak Sokol Organisation had to fight to receive it´s property in Czech and also Slovak Republic. Sokol´s movement in both newly developed republics had and still have generational problems.

Czech Sokol Organisation /COS/ in present time has around 1100 units with 190OO0 members. New organization of Sokol in Slovak Republic has a new title Sokol in Slovakia has around only 80 units and around 5000 members. In both Sokol´s organisations more and more are coming a young generation to practise a new modern sport activities. Members of Sokol´s organization participating also at World Gymnaestradas, etc. In present time /spring –sommer 2012/ lot of member of Sokol´s units from Czech and Slovak Republic are preparing for a great Sport Festival - Pan – Sokol Slet which will be hold at 3Oth June – July 7th 2012 in Prague.

Both Sokol´s organisations from Czech and Slovak Republic in present time are a member of World Sokol Union.

GYMNASTICS RESULTS at OLYMPIC GAMES 1896 – 2008

Place/Year	Country	Results
Paris 1900	Bohemia	All – around: 34. František Erben
London 1908	Bohemia	All – around: 25. Josef Cada 36. Bohumil Honzatko
Stockholm 1912	Bohemia Hungary	All – around: 36. Bohumil Honzatko 2. team competition Ludovit Kmetko as a member of the Hungarian team, the first Slovak Olympic medalist, born at Košice - East Slovakia
Antwerpen 1920	Czechoslovakia	Team competition: 4. (Josef Bochnicek, Ladislav Bubenicek, Josef Cada, Miroslav Klinger, Josef Maly, Stanislav Indruch, Zdenek Opocensky, Josef Pagac, Frantisek Pechacek, Robert Prazak, Vaclav Stolar, Svatopluk Svoboda, Ladislav Vacha, Frantisek Vanecek, Jaroslav Velda, Vaclav Wirt)
Paris 1924	Czechoslovakia	All – around: 2. Robert Prazak, 3. Bedrich Supcik, 5. Miroslav Klinger, 6. Ladislav Vacha, 11. Jan Koutny, 13. Bohumil Morkovsky Parallel bars: 2. Robert Prazak 6. Ladislav Vacha Vault: 2. Jan Koutny, 3. Bohumil Morkovsky Rings: 2. Robert Prazak, 3. Ladislav Vacha, 5. Bedrich Supcik Rope climbing /9m/: **Bedrich Supcik – 7.2 seconds: it was the first gold for Czechoslovakia**
Amsterdam 1928	Czechoslovakia	Team competition: 2. Czechoslovakia All – around: 9. Ladislav Vacha, 10. Emanuel Loffler, 13. Jan Gajdos, 14. Josef Effenberger, 20. Bedrich Supcik 28. Vaclav Vesely, 31. Jan Koutny, 37. Ladislav Tikal Parallel bars: 1. Ladislav Vacha, 4. – 6. Jan Gajdos and Bedrich Supcik Vault: 1. Emanuel Loffler Rings: 2.Ladislav Vacha, 3. Emanuel Loffler, 6. Bedrich Supcik
Berlin 1936	Czechoslovakia	MAG: Team competition: 5. Czechoslovakia All – around: 4. Alois Hudec, 22. Jaroslav Kollinger, 25. Jan Sladek, 27. Jan Gajdos, 33. Vratislav Petracek, 36. Jindrich Tintera, 38. Emanuel Loffler Rings: 1. Alois Hudec: his routine was: vertical pull-

		up, arms sidewards and straight, to „L“ support, press to handstand bent body with straight arms, lower to inverted cross, arms horizontal and straight, lower to cross, lower to front lever, inlocate with straight body, Stemme bacward to cross, Felge forward with straight body and slowly press to handstand, Felge backward to cross, „L“ cross, lower with straight body to straight inverted hang, inlocate forward with straight body, inlocate to piked inverted hang and dislocate layout flyaway. Parallel bars: 4. Alois Hudec WAG: Team competition: 2. Czechoslovakia (Jaroslava Bajerova, Vlasta Dekanova, Bozena Dobesova, Vlasta Foltova, Anna Hrebrinova, Matilda Palfiova, Zdenka Vermirovska, Marie Vetrovska)
London 1948	Czechoslovakia	MAG: Team competition: 6. Czechoslovakia (Zdenek Ruzicka, Pavel Benetka, Vladimir Karas, Leo Sotornik, Frantisek Wirt,Miloslav Malek) All – around: 7. Zdenek Ruzicka, 23. Pavel Benetka, 25. Miloslav Malek, 48. Vladimir Karas, 50. Leo Sotornik Rings: 3. Zdenek Ruzicka, 6. Vladimir Karas Floor exercise: 3. Zdenek Ruzicka, 6. – 7. Leo Sotornik, Pavel Benetka Vault: 3. – 5. Leo Sotornik WAG: Team competition: 1. Czechoslovakia (Zdenka Honsova, Miloslava Misakova, Vera Ruzickova, Bozena Srncova, Milena Mullerova, Zdenka Vermirovska, Olga Silhanova, Marie Kovarova)
Helsinki 1952		MAG: Team competition: 7. Czechoslovakia All – around: 13. Danis Ferdinand , 30. Zdenek Ruzicka, 37. Josef Svoboda, 41. Leo Sotornik, 44. Josef Skvor, 45. Jindrich Mikulec, 54. Vladimir Kejr, 63. Milos Kolejka WAG: Team competition: 3. Czechoslovakia All – around: 14. Eva Vechtova, 20. Elena Chadimova, 21. Jana Rabasova, 22. Bozena Srncova, 31. Hana Bobkova, 33. Matylda Sinova, 34. Vera Vancurova, 47. Alena Reichova
Melbourne 1956	Czechoslovakia	MAG: Team competition: 4. Czechoslovakia All – around: 13. Ferdinand Danis, 18. Josef Skvor, 23. Vladimir Kejr, 26. Zdenek Ruzicka, 27. – 28. Jaroslav Mikoska, 36. Jaroslav Bim Floor exercise: 6. Ferdinad Danis Pommel horse: 4.Josef Skvor, 6. Jaroslav Bim WAG: Team competition: 7. Czechoslovakia All – around: 7. Eva Bosakova, 11. Anna Marejkova,

		25. Matylda Sinova, 31. Vera Drazdikova 39. Alena Reichova, 40. Miroslava Brdickova Beam: 2. – 3. Eva Bosakova, 4. – 5. Anna Marejkova Uneven bars: 4. Eva Bosakova Floor exercise: 4. – 6. Eva Bosakova
Roma 1960	Czechoslovakia	MAG: Team competition: 4. Czechoslovakia All – around: 15. Ferdinand Daniš, 18. Jaroslav Stastny, 23. Jaroslav Bim, 28. Pavel Gajdos 33. Josef Trmal, 54. Ladislav Pazdera Floor exercise: 6. Jaroslav Stastny WAG: Team competition: 2. Czechoslovakia All – around: 8. Vera Caslavska, 10. Eva Bosakova, 13. Ludmila Svedova, 14. Adolfina Tacova 24. Matylda Matouskova – Sinova, 31. Hana Ruzickova Floor exercise: 4. Eva Bosakova Beam: 1. Eva Bosakova, 6. Vera Caslavska Vault: 4. Adolfina Tacova
Tokyo 1964	Czechoslovakia	MAG: Team competition: 6. Czechoslovakia All – around: 30. Bohumil Mudrik, 42. Ladislav Pazdera, 43. Vaclav Kubicka, 45. Karel Klečka 52. Premysl Krbec, 106. Pavel Gajdos WAG: Team competition: 2. Czechoslovakia All – around: 1. Vera Caslavska, 5. Hana Ruzickova, 11. Jaroslava Sedlackova, 16. Adolfina Tkacikova 22. Mariana Krajcirova, 23. Jana Posnerova Vault: 1. Vera Caslavska Beam: 1. Vera Caslavska, 5. Hana Ruzickova Uneven bars: 5. Vera Caslavska Floor exercise: 6. Vera Caslavska
Mexico City 1968	Czechoslovakia	MAG: Team competition: 4. Czechoslovakia All – around: 19. Vaclav Kubicka, 2O. Jiri Fejtek, 22. Frantisek Bocko, 28. Bohumil Mudrik 37. Miloslav Netusil, 38. Vaclav Skoumal Parallel bars: 6. Vaclav Kubicka WAG: Team competition: 2. Czechoslovakia All – around: 1.Vera Caslavska, 7. Bohumila Rimnacova, 9. Mariana Krajcirova, 9. Miroslava Sklenickova 11. Hana Liskova, 15. Jana Kubickova Floor exercise: 1. Vera Caslavska, 5. – 6. Bohumila Rimnacova Beam: 2. Vera Caslavska Parallel bars: 1. Vera Caslavska, 3. Bohumila Rimnacova, 6. Miroslava Sklenickova Vault: 1. Vera Caslavska, 4. Mariana Krajcirova, 6. Miroslava Sklenickova
Munich 1972	Czechoslovakia	MAG: Team competition: 9. Czechoslovakia (Jiri Fejtek, Ladislav Morava, Pavel Stanovsky, Bohumil Mudrik, Vladislav Nehasil, Miloslav Netušil) All – around: 36. Jiri Fejtek

		WAG: Team competition: 5. Czechoslovakia (Mariana Nemethova – Krajcirova, Zdena Dornakova, Sona Brazdova, Zdena Bujnackova, Hana Liskova, Marcela Vachova) All – around: 12. Mariana Nemethova – Krajcirova, 24. Sona Brazdova, 27. Zdena Dornakova 29. Zdena Bujnackova, 32. Hana Liskova
Montreal 1976	Czechoslovakia	MAG: Team competition: 9. (Jan Zoulik Miloslav Netusil, Vladislav Nehasil, Gustav Tannenberger, Dimitrios Janulidis, Jiri Tabak) All – around: 18. Gustav Tannenberger, 20. Jiri Tabak, 25. Miloslav Netušil Parallel bars: 5. Miloslav Netusil WAG: Team competition: 5. Czechoslovakia (Drahomira Smolikova, Jana Knopova, Anna Pohludkova, Alena Cermakova, Eva Poradkova, Ingrid Holkovicova) All – around: 10. Anna Pohludkova, 15. Jana Knopova, 16. Ingrid Holkovicova Floor exercise: 4. Anna Pohludkova
Moscow 1980	Czechoslovakia	MAG: Team competition: 6. Czechoslovakia (Rudolf Babiak, Josef Konecny, Miloslav Kucerik, Jan Migdau, Jiri Tabak, Jan Zoulik) All – around: 8. Jiri Tabak, 21. Rudolf Babiak, 25. Jan Zoulik Floor exercise: 4. Jiri Tabak Rings: 3. Jiri Tabak Vault: 6. Jiri Tabak WAG: Team competition: 4. Czechoslovakia (Dana Brydlova, Jana Labakova, Eva Mareckova, Katarina Sarisska, Anita Sauerova, Radka Zemanova) All – around: 10. Radka Zemanova, 11. Jana Labakova, 12. Eva Mareckova Floor exercise: 6. Jana Labakova
Seoul 1988	Czechoslovakia	WAG: Team competition: 7. Czechoslovakia (Iveta Polokova, Alena Drevjana, Martina Veliskova, Jana Vejrkova, Hana, Ricna, Ivona Krmelova) All – around: 17. Iveta Polokova
Barcelona 1992	Czechoslovakia	MAG: All – around: 62. Martin Modlitba, 77. Arnold Bugár
Atlanta 1996	Czech Slovakia	MAG: All – around:58. Jiri Firt WAG: All – around: 67. Gabriela Krcmarova WAG: All – around: 70. Klaudia Kinska
Sydney 2000	Czech Slovakia	WAG: All – around: 29. Jana Komrskova WAG: All – around: 59. Zuzana Sekerova
Athen 2004	Czech Slovakia	WAG: All – around: 32. Jana Komrskova WAG: All – around: 47. Zuzana Sekerova
Beijing 2008	Czech Slovakia	MAG: All – around: 93. Martin Konecny WAG: All – around: 21. Krystina Palesova WAG: All – around: 93. Ivana Kovacova

GYMNASTICS RESULTS at WORLD CHAMIPONSHIPS 1907 – 2011

Prague 1907	MAG: Team competition: 1. Czech All – around: 1. Josef Cada, 3. Frantisek Erben, 4. Karel Stary, 6. Karel Sal, 7. Josef Seidl, 9. Bohumil Honzatko
Luxembourg 1909	MAG: Team competition: 2. Czech (Josef Cada, Frantisek Erben, Karel Stary, Ferdinand Steiner, Frantisek Markovsky, Frantisek Mracek) All – around: 2. Josef Cada, 7. Karel Stary, 9. Frantisek Erben
Torino 1911	MAG: Team competition: 1. Czech All – around: 1. Ferdinand Steiner
Paris 1913	MAG: Team competition: 1. Czech (Karel Stary, Josef Sykora, Josef Cada, Ferdinad Steiner, Douda, Prazak) All – around: 2. Karel Stary, 3. Josef Sykora, 6. Josef Cada, 9. Ferdinad Steiner
Ljubljana1922	MAG: Team competition: 1. Czechoslovakia All – around: 1. Frantisek Pechacek, 4. Miroslav Klinger, 6. Stanislav Indruch, 7. Josef Maly, 9. Miroslav Karasek, 10. Frantisek Vanecek
Lyon 1926	MAG: Team competition: 1. Czechoslovakia (Josef Effenberger, Ladislav Vacha, Jan Karafiat, Frantisek Pechacek, Bedrich Supcik, Jan Gajdos, Ladislav Riesner, Vaclav Vesely) All – around: 2. Josef Effenberger, 3. Ladislav Vacha, 4. Jan Karafiat, 5. Frantisek Pechacek
Luxembourg 1930	MAG: Team competition: 1. Czechoslovakia All – around: 2. Jan Gajdos, 3. Emanuel Loffler, 5. Ladislav Vacha Floor exercise: 2. Emanuel Loffler
Budapest 1934	MAG: Team competition: 2. Czechoslovakia (Alois Hudec, Jaroslav Kollinger, Jan Gajdos, Jan Sladek , Emanuel Loffler, Ladislav Tikal, Jindrich Tintera, Jaroslav Baroch) All – around: 3.Emanuel Loffler, 5. Jan Sladek, 6. Jan Gajdos Rings: 1. Alois Hudec, 3. Jaroslav Kollinger Pommel horse: 3. Jan Sladek WAG: Team competition: 1. Czechoslovakia (Vlasta Dekanova, Zdena Vermirovska, Eleonora Hajkova- Buddeusova, Anna Hrebrinova, Vlasta Foltova, Vlasta Jaruskova, Milena Sebkova, Jaroslava Bajerova) All – around: 1. Vlasta Dekanova, 5. Zdena Vermirovska
Prague 1938	MAG: Team competition: 1. Czechoslovakia (Jan Gajdos, Jan Sladek, Alois Hudec, Gustav Hruby, Jindrich Tintera, Vratislav Petracek, Emanuel Loffler, Josef Novotny) All – around: 1. Jan Gajdos, 2. Jan Sladek, 4. Alois Hudec, 6. Gustav Hruby Floor exercise: 1. Jan Gajdos, 2. Alois Hudec Rings: 1. Alois Hudec, 3. Vratislav Petracek High bar: 2. Alois Hudec Parallel bars: 2. Alois Hudec Pommel horse: 2. Vratislav Petracek WAG: Team competition: 1. Czechoslovakia (Vlasta Dekanova, Zdena Vermirovska, Matilda Palfiova, Vlasta Foltova, Bozena Dobesova, Hana Nezerkova, Marie Skalova, Marie Hendrychova) All – around: 1. Vlasta Dekanova, 2. Zdena Vermirovska, 3. Matilda Palfiova

Roma 1954	MAG: Team competition: 5. Czechoslovakia (Zdenek Ruzicka, Jindrich Mikulec, Vladimir Kejr, Vladimir Prorok, Josef Skvor, Jaroslav Bim, Leo Sotorník, Ferdinand Daniš) WAG: Team competition: 3. Czechoslovakia (Eva Bosakova, Alena Chadimova, Vera Drazdikova, Zdena Liskova – Honsova,Hana Marejkova, Alena Reichova, Vera Vancurova) All – around: 2. Eva Bosakova, 9. Alena Chadimova Floor exercise: 2. Eva Bosakova Beam: 2. Eva Bosakova Combined exercise: 3. Czechoslovak team
Moscow 1958	MAG: Team competition: 3. Czechoslovakia All – around: 12. Ferdinand Danis, 20. Josef Skvor, 24. Jaroslav Bim, 29. Karel Klecka, 35. Jindrich Mikulec, 42. Pavel Gajdos WAG: Team competition: 2. Czechoslovakia All – around: 2. Eva Bosakova, 8. Vera Caslavska, 12. Ludmila Svedova, 14. Anna Marejkova, 26. Matylda Matuskova, 34. Adolfina Tacova Floor exercise: 1. Eva Bosakova Beam: 1. Eva Bosakova Uneven bars: 3. Eva Bosakova
Prague 1962	MAG: Team competition: 3. Czechoslovakia All – around: 16. Karel Klecka, 19. Jaroslav Stastny, 25. Pavel Gajdos, 31. Vaclav Kubicka, 48. Premysl Krbec, 51. Ladislav Pazdera Vault: 1. Premysl Krbec, Floor exercise: 6. Jaroslav Stastny WAG: Team competition: 2. Czechoslovakia All – around: 2. Vera Caslavska, 4. Eva Bosakova, 13. Libuse Cmiralova, 15. Ludmila Svedova, 21. Hana Ruzickova, 22. Adolfina Tkacikova Vault: 1. Vera Caslavska Uneven bars: 2. Eva Bosakova, 5. Vera Caslavska Beam: 1. Eva Bosakova, 5. Vera Caslavska Floor exercise: 3. Vera Caslavska, 4.-5. Eva Bosakova
Dortmund 1966	MAG: Team competition: 4. Czechoslovakia All – around: 25. Bohumil Mudrik, 27. Vaclav Kubicka, 30. Vaclav Skoumal, 35. Jaroslav Stastny, 50. Frantisek Bočko, 76. Karel Klecka WAG: Team competition: 1. Czechoslovakia All – around: 1. Vera Caslavska, 5. Jaroslava Sedlackova, 7. Mariana Krajcirova, 8. Jana Kubickova, 16. Bohumila Rimnacova, 18. Jindra Kostalova Vault: 1. Vera Caslavska, 5. Mariana Krajcirova Uneven bars: 4. Vera Caslavska Beam: 2. Vera Caslavska, 6. Jaroslava Sedlackova Floor exercise: 2. Vera Caslavska, 5. Jana Kubickova
Ljubljana 1970	MAG: Team competition: 9. Czechoslovakia All – around: 25. Miloslav Netusil, 33. Miroslav Reizenthaler, 49. Vladislav Nehasil, 51. Ladislav Morava, 56. Bohumil Mudrik, 63. Vaclav Skoumal WAG: Team competition: 3. Czechoslovakia All – around: 11. Marcela Vachova, 13. Bohumila Rimnacova, 19. Sona Brazdova, 20. Mariana Nemethova, 25. Luba Krasna, 35. Hana Liskova Vault: 5. Marcela Vachova

	Uneven bars: 4. – 5. Mariana Nemethova
Varna 1974	MAG: Team competition: 9. Czechoslovakia All – around: 20. Miloslav Netusil – comp.N.2, 33. Gustav Tannenberger – comp.N.2, 39. Vladislav Nehasil, 50. Jiri Tabak, 55. Pavel Stanovsky, 56. Ladislav Morava WAG: Team competition: 5. Czechoslovakia All – around: 14.- 15. Jana Knopova, 19. Zdena Dornakova, 21. Drahomira Smolikova, 30. Vaclava Soukupova 33. Zdena Bujnackova, Competition 1:27. -28. Bozena Perdykulova Vault: 3. Bozena Perdykulova
Strasbough 1978	MAG: Team competition: 9. Czechoslovakia All – around: 26. Jiri Tabak, 31. Jan Migdau, 61. Josef Konecny, 66. Borivoj Koldovsky, 71.- 72 Rudolf Babiak, 76. Vladislav Nehasil Floor exercise: 8. Jiri Tabak WAG: Team competition: 6. Czechoslovakia All – around: 6. Vera Cerna, 13. Dana Brydlova, 16. Eva Mareckova, 34. Anita Sauerova, 39. Jana Gajdosova, 41. Radka Zemanova Uneven bars: 7. Vera Cerna Beam: 5. Vera Cerna Floor exercise: 6. Vera Cerna
Fort Worth 1979	MAG: Team competition: 10. Czechoslovakia All – around: 25. Jiri Tabak, 31. – 32. Josef Konecny, 68. Jan Zoulik, 71. – 72. Rudolf Babiak, 93. Josef Fic, 94. Borivoj Koldovsky Vault: 6. Jiri Tabak WAG: Team competition: 5. Czechoslovakia All – around: 6. Vera Cerna, 10. Eva Mareckova, 14. Radka Zemanova, 33. Katka Sarisska, 38. Anita Sauerova, 50. Lanka Charvatova Beam: 1. Vera Cerna, 4. Eva Mareckova Floor exercise: 6. Vera Cerna
Moscow 1981	MAG: Team competition: 16. Czechoslovakia (85. Rudolf Babiak, 88. Jan Zoulik, 93. Jan Migdau, 98 Josef Konecny, 100. Peter Netrebsky, 104. Miroslav Kucerik) WAG: Team competition: 5. Czechoslovakia All – around: 9. Eva Mareckova, 12. Martina Polcrova, 15. – 16. Jana Labakova, 33.Jana Gajdosova, 34. Jana Rulfova, 51. Katka Sarisska Vault: 8. Eva Mareckova
Budapest 1983	MAG: Team competition: 14. Czechoslovakia (58. Dusan Hilbert, 65. Daniel Orlet, 77. Vladimir Brummer, 90. Ludek Hofer, 96. Vladimir Mureso, 109. Koloman Hianik) WAG: Team competition: 6. Czechoslovakia All – around: 14. Hana Ricna, 17. Jana Labakova, 25. – 26. Martina Polcrova, 32. Iva Cervenkova, 40. – 41. Helena Martinkova, 47. Jana Gajdosova Uneven bars: 8. Hana Ricna Beam: 2.Hana Ricna, 5. – 7. Iva Cervenkova
Montreal 1985	WAG: Team competition: 5. Czechoslovakia (Alena Drevjana, Miroslava Koblizkova, Jana Labakova, Lenka Pitlovicova, Iveta Polokova, Hana Ricna)

	All – around: 8. Hana Ricna, 10. Iveta Polokova, 20. Alena Drevjana Uneven bars: 3. Hana Ricna Beam : 4. Iveta Polokova, 5. Hana Ricna Floor exercise: 6. Iveta Polokova, 8. Lenka Pitlovicova
Rotterdam 1987	MAG: Team competition: 18. Czechoslovakia (Duzsan Hilbert, Ludek Hofer, Koloman Hianik, Jiri Hron, Janis Kasapidis, Vladimir Mures) WAG: Team competition: 11. Czechoslovakia (Jana Casteckova, Andrea and Miriam Hullova, Lenka Tichopadova, Iveta Polokova, Jana Vejrkova) All – around: 21. Iveta Polokova, 34. Jana Casteckova
Stuttgart 1989	WAG: Team competition: 12. Czechoslovakia (Estera Barcova, Jana Casteckova, Alena Drevjana, Iveta Polokva, Adriana Slezakova, Martina Veliskova) All – around: 35. Iveta Polokova
Indianapolis 1991	MAG: Team competition: 17. Czechoslovakia (Martin Modlidba, Tomas Tvrdy, Ludek Hofer, Jiri Hron, Arnold Sugar, Mirek Smetana) WAG: Team competition: 14. Czechoslovakia (Iveta Polokova, Daniela Bartova, Erika Dungelova, Miroslava Jantekova, Martina Kucharcikova, Pavla Kinclova) All – around: 30. Iveta Polokova, 33. Daniela Bartova
Paris 1992	MAG: Floor: 14. Martin Riesner, Vault: 16. Martin Reisner, 21. Martin Modlidba Parallel bars: 16. Martin Modlidba, High bar: 36. Martin Modlidba WAG: Vault: 12. Pavla Kinclova, 52. S. Kudilkova, Uneven Bars: 19. Martina Kucharcilova, Beam: 33. Pavla Kinclova, 42. S. Kudilkova, Floor: 41.S. Kudilkova, 49. Pavla Kinclova
Birmingham 1993	MAG: All – around: 68. Arnold Bugar, 107. Matin Reisner, WAG: All – around: 47. Klara Kudilkova 49. Klaudia Kinska, Vault: 6. Klara Kudilkova
Brisbane 1994	MAG: Czech: All – around: 26. Miroslav Smetana, 31. Tomas Tvrdy, 73. Peter Novak, Pommel horse: 66. Milan Krejci, Rings: 17. Miroslav Smetana, 66. Peter Novak, 28. Martin Riesner, Parallel bars: 28. Miroslav Smetana, 35. Tomas Tvrdy, 53. Peter Novak, High bar: 33. Tomas Tvrdy, 36. Miroslav Smetana, Martin Reisner, Slovakia: All – around: 58. Arnold Bugar Floor: 15. Marian Kovac Vault: 65 Marian Kovac, Parallel bars: 45. Arnold Bugar, High bar: Arnold Bugar,
Dortmund 1994	WAG: Czech: All – around: 55. Pavla Kinclova, Vault: 57 Pavla Kinclova, Uneven bars: 26. Pavla Kinclova, Beam: 14. Pavla Kinclova, Floor: 61: Pavla Kinclova Slovakia: All – around: 41. Martina Kucharcikova, 48. Klaudia Kinska, Vault: 12. Klaudia Kinska, Uneven bars: 34. Martina Kucharcikova, Beam: 17. Klaudia Kinska, 28. Martina Kucharcikova, Floor: 34. Klaudi Kinska, 47. Martina Kucharcikova MAG: 18. Czech
Sabae 1995	MAG: Czech: Team competition: 19. (133. Martin Reisner, 134. Peter Novak, 154. Milan Krejci, 158. Pavel Lakomy, 178. David Splika, 187. Tomas Tvrdy) Slovakia: All – around: 90. Marian Kovac, 110. Peter Kistof, WAG: Czech: Team: 25. All – around: 83. Gabriella Krcmarova, 86. Pavla Kinclova, 100. Katerina Binova, 133. Katerina Fialova, 146. Klara Slavikova, 169. Martina Binova, 194. Milana Novotna

	Slovakia: All – around: 76: Martina Kucharchikova, 78. Klaudia Kinska, 114. Silvia Vlckova
Puerto Rico 1996	
Laussane 1997	MAG: Czech: Team competition: 19. (52. Jiri Firt, 93. David Splika, 156.Peter Novak, 159. Jiri Veska, 186. Vit Kaspar, 192. Daniel Rexa) Slovakia: Team competition 29. (85. Marian Kovac, 86. Stanislav Micheller, 90. Peter Kristof, 105. Necli Andrej, 202. Daniel Kamenicky, 234. Peter. Nahly) WAG: Czech: All – around: 86. Darina Stastna, 87. Silvie Hejlikova, Slovakia: Team competition: 17. (52. Adriana Tonckova, 90. Henrieta Kurasova, Lubica, Bohmerova, 99.Anna Mesarinkova, 131. Monika Krivdova, 149. Maria Kracova)
Tianjin 1999	MAG: Czech: Team competition: 32. (81. Jiri Firt, 96. Lubomir Matera, 204. Daniel Rexa, 215. Jan Smejkal, 219. Vit Kaspar, 273 Peter Novak) Slovakia: Team competition: 26. (77. Andrej Necli, 106. Stanislav Micheller, 199. Marian Kovac, 212. Jan Petrovic, 242. Daniel Kamenicky, 249. Peter Kristof) WAG: Czech: Team competition: 16. (33. Jana Komrskova, 60. Katerina Marsova, 72. Pavla Feresova, 85. Olga Svoboda, 231. Lenka Nedlova, 243. Darina Stastna) Slovakia: Team competition: 24. (52. Zusana Sekerova, 55. Veronika Adamska, 100. Adriana Tonkovicova, 125. Anna Mesarkinova, 147. Eva Sevcova,
Ghent 2001	MAG: Czech: Team competition: 24. (65. Martin Konecny, 95. Martin Vlk, 100. Daniel Rexa, 162. David Vyoral, 222. David Spilka, 236. Matera Lubomir) Slovakia: Team competition 20. (54. Alexander Benko, 75. Andrej Necli, 101. Samuel Piasecky, 108. Jan Petrovic, 232. Peter Kristof, 267. Pavel Mikos) WAG: Czech: Team competition:17. (57. Jana Komrskova, 82. Michaela Radkova, 134. Katerina Maresova, 135. Nela Kuncova, 137. Suzana Obonova, Katerina Panyrkova) Slovakia: Team competition: 16. (55. Suzana Sekerova, 62. Veronika Adamska, 66. Monika Kvankova, 79.Dobroslava Lehtska, 111. Jana Drabikova)
Debrecen 2002	MAG: Czech: Floor: 24. David Vyoral, 32. Martin Konecny, Rings: 52. Vladimir Novotny, High bar: 28. Martin Konecny, Slovakia: Floor: 52. Aleksander Benko Pommel horse: 36. Samuel Piasecky, 60. Aleksander Benko Rings: 35. Jan Petrovic, Parallel bars: 36. Samuel Piasecky, WAG: Czech: Vault: 13. Jana Komrskova, Uneven bars: 9. Jana Komrskova, Beam: 28. Jana Komrskova,
Anahaim 2003	MAG: Czech: Team competition: 28. (70. Martin Konecny, 107. Jiri Firt, 114. Martin Vlk, 212. Daniel Rexa, 265. Petr Smejkal, 285. David Vyoral) Slovakia: Team competition: 29. (65. Samuel Piasecky, 80.Jan Petrovic, 81. Aleksander Benko, 201. Andrej Necli, 217. Pavel Mikus, 311. Stanislav Micheller) WAG: Czech: Team competition: 22. (50. Jana Komrskova, 76. Katerina Maresova, 84. Veronika Ozanova, 87. Jana Sikulova, 180. Michaela

	Rakova, 223. Petra Sulcova) Slovakia: Team competition: 27. (74. Veronika Adamska, 78. Suzana Sekerova, 116. Jana Luptakova, 136. Maria Homolova, 186. Jana Drabikova, 220. Petra Mudrakova)
Melbourne2005	MAG: Czech: All – around: 27. Martin Konecny, 36. Daniel Rexa, 166. David Vyoral Slovakia: All – around: 75. Samuel Piasecky, WAG: Czech: All – around: 37. Katerina Maresova, 87. Jana Sikulova Slovakia: All – around: 50. Suzana Sekerova, 77. Veronika Adamska
Aarhus 2006	MAG: Czech: Team competition: 39. (104. Michael Boltnar, 108. Martin Vlak, 115. Petr Smejkal, 188. Martin Ruzicka, 238. Daniel Rexa, 251. David Vyoral) Slovakia: All – around: 73. Samuel Piasecky WAG: Czech: Team competition: 20. (32. Jana Komrskova, 74. Jana Sikulova, 166. Martina Strnadova, 170. Adela Pavoukova, 171. Nicole Pechancova, 172. Veronika Ozanova) Slovakia: All – around: 108. Natalia Paulickova, 109. Martina Homolova
Stuttgart 2007	MAG: Czech: All – around: 42. Martin Konecny, 115. Petr Smejkal, 249: David Vyoral Slovakia: All – around: 79. Samuel Piasecky WAG: Czech: Team competition: 16. (20. Kristina Palesova, 26. Jana Komrskova, 52. Jana Sikulova, 54. Nicole Pechancova, 203.Martina Strnadova, 205. Eva Verbova) Vault: 7. Jana Komrskova Slovakia: All – around: 85. Ivana Kovacova, 98. Maria Homolova, 100. Natalia Paulickova
London 2009	MAG: Czech: All – around: 110. Martin Konecny, WAG: Czech: All – around: 50. Eva Verbova, 102. Jana Komrskova, 142. Jana Sikulova Slovakia: All – around: 112. Ivana Kovacova,
Rotterdam 2010	MAG: Czech: Team competition: 36. (67. Martin Konecny, 96. Petr Smejkal, 112. Michal Boltnar, 207. Jiri Vesely, 267. Jindrich Pansky, 278. Jiri Bomer) Slovakia: All – around: 53. Samuel Piasecky WAG: Czech: Team competition: 30. (70. Jana Sikulova, 102. Nicole Pechancova, 134. Alice Janova,172. Klara Hadrbolcova, 207. Marcela Molackova) Slovakia: All – around: 79. Maria Homolova,
Tokyo 2011	MAG: Czech: All – around: 78 Martin Konecny, 261. Petr Smejkal Slovakia: All – around: 77. Samuel Piasecky, 127. Stano Michnak WAG: Czech: All – around: 58. Kristina Palesova, 214. Jana Sikulova Slovakia: All – around: 83. Maria Homolova,

Outstanding personalities in FIG from Czechoslovakia, Czech and Slovak Republic

Josef Scheiner	Treasurer in 1920. In 1921 he proposed the new name of International Gymnastics Federation /FIG/ after the United States of America had joined. He was Vice-President FIG from 1924 to 1932.
Vladimir Muller	FIG treasurer 1932 – 1952
Miroslav Klinger	Vice – Chairman of the Executive Commission /after become the MTC/in 1932. President in 1949 – 1950. Author of a very lucid history and criticism of FIG. Ardent partisan of the Slav and Sokol contribution to the International Federation. He was the great gymnast and a very good coach of the Czechoslovak men team. He participated at OG 1920 , 4th place with CSR team, at WCh 1922 -1st place with team CSR and at OG 1924, 5th place in all – around competition.
Maria Provaznikova	Marie Provaznikova in the 1934 together with Countess Jadwiga Zamoyska laid the foundation for establishing an independent Women´s Technical Committee of which she eventually to be president. In 1935 – 1938 she was a Vice-president of Women´s Technical Committee FIGIn 1946 – 1948 she was President of the Women´s Technical Committee FIG. At the Olympic games in London 1948 she was a delegate to the Congress of the FIG and in her capacity as president of the Women´s Technical Committee became chief organizer of the women´s gymnastic competition. Contributed to specific events with suitable female exercises. She did not agree with communist resim in Czechoslovakia after February 1948 so for this reason she emigrated immediately from OG in London 1948 to the USA. In USA she was as teacher in schools and worked in Sokol´s unit and she died at January 11th 1991 in city Schenectady.
Eleonora Buddeusova - Hajkova	Eleonora Buddeussova was a member of Women´s Technical Committee FIG in period 1946 – 1948 and in 1947 – 1948 she was as president. She also was a very good gymnast and participated at WCh 1934 where with CSR team took 1st place.

Alex Lylo	Alex Lylo was a member of the Men´s Technical Committee FIG in period 1960 – 1984. In period 1976 – 1984 he was president of MTC FIG. He was also good gymnast and a very good coach of the CSR men team special at WCh 1954 and at WCh 1958 etc.
Jaroslava Matlochova	Jaroslava Matlochova was a member of the Women´s Technical Committee FIG in a period 1976 – 1988. She also was a very good coach of the CSR women team in 60 – ties and achieved great success at WCh 1962, 1966-wolrd champion and at OG 1964, 1968 . Mrs. Matlochova with hasband Vít Matlocha was many years in Italy.
Vera Černa	Mrs. Černa was a member of Technical Committee of Rhythmic gymnastics in period 1967 – 1984.
Jan Novak	Mr. Novak is member of FIG Council from 2000 till now. He is also from 1990 till now /2012/ a president of the Slovak gymnastics federation .
Monika Siskova	Mrs. Siskova is from 2004 member of the FIG Gymnastics for all Committee. Mrs. Siskova is from 1996 general secretary of the Slovak gymnastics federation.
Ladislav Zeman	FIG Trampoline TC member

Czeczh and Slovak gymnasts who introduced new elements (by Götze, Uhr 1994)

Emanuel Löffler	Floor: two circles
Jiri Tabak	Floor: jump backward with half turn and double salto forward tucked
Prazak	Rings: cross hold
Ferdinand Steiner	Rings: inverted cross
Josef Cada	Parallel bars: czechkehre
Vaclav Skoumal	High bar: giant swing backward with inlocation during swing and dislocate to handstand
	High bar: Czech giant - giant backward in back hang
Pardubski	High bar: salto forward stretched
Vera Caslavska	Uneven bars: from front support on HB – swing bwd with release and 1/1 turn (360°) to hang on HB
Hana Ricna	Uneven bars: Stalder bwd on HB with counter straddle -reverse hecht over HB to hang
Vera Cerna	Uneven bars: Stalder

Jana Rulfova	Balance beam: flic -flac with 1/1 twist (360°) – swing down to cross straddle sit
Eva Bosakova	Balance beam: round off
Vera Časlavska	Balance beam: handspring forward
Radka Zemanova	Balance beam: handspring backward in sideposition
Klara Kudilkova	Balance beam: leap fwd with leg change _and ¼ turn (90°) to side split (180°)
Eva Bosakova	Balance beam: dismount: free (aerial) walkover fwd with ½ twist
Vera Časlavska	Balance beam: dismount: round off, salto backward tucked BB dismount: round off, salto backward with 1/1 turn
Iva Cervenkova	Balance beam: dismount: salto backward stretched with 3/1 turns
Zdenka Bujnackova	Floor: salto backward stretched with 2/1 turns

Conslusion

Gymnastics in Slavic countries started in 1862 with Sokol club in Prague. Leader Miroslav Tyrš made strong organisation within Austro Hungary imperia, which competed also at Olympic Games under Bohemia name. After World War I Czech and Slovak nations joint in new state Czechoslovakia. Time between world wars was most succesfull time with many gold medals at Olympic games and Word Championships. After the second world war communist party took a leading role in gymnastics development with higlight on women gymnastics side, Vera Caslavska is the best athlete of this time. After velvet revolution Czechoslovakia split into two countries Czech and Slovakia. Gymnastics tradition continues again under Sokol brand name.

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HOW MUCH ARTISTIC GYMNASTICS COACHES KNOW ABOUT THEIR GYMNASTS' MOTIVATION

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Original research article

Abstract

Sport seems to increasingly attract children and youth participation worldwide, possibly because many of them dream of competing in the Olympics, becoming champions, and being financially rewarded. However, only a few are aware of the level of commitment and sacrifices required in order to succeed. The purpose of this study was to analyze the Brazilian coaches' perceptions of their athletes' motivation and how they deal with this issue. Results revealed that Artistic Gymnastics training seems to highly demand gymnasts' motivation to practice, and some strategies used by coaches to motivate gymnasts should be carefully reviewed. Other motivational strategies are limited due to the circumstances of the sport in Brazil, particularly regarding investment in infrastructure and support for gymnasts.

Keywords: *artistic gymnastics, motivation, coaches' perception.*

INTRODUCTION

Psychological factors such as anxiety, concentration, confidence, motivation, and personality have a significant impact on performance in sports (Morrow, Jackson, Disch & Mood, 2000). In some cases, these factors can be critical to the success in sports, particularly at the highest levels.

Individuals may have an inherent initial level of motivation and interest and, if well supported, may remain in the sport long term (Lopes & Nunomura, 2007). Children and adolescents may show natural interest and motivation for sports as well, but it is important to keep them committed, regardless the sport or the level of practice. It is assumed that there is a linear relationship between motivation and dropout in Artistic Gymnastics (AG). So, any untreated problems will sooner or later lead to dropout, and appropriate motivational strategies may help to prevent dropout.

Among a wide range of sports AG can be attractive to children and youth, keeping them committed due to its challenging nature, its variety of movements, and its potential benefits. However, many participants who start in AG may not be sufficiently motivated to progress towards the competitive level for a variety of reasons. In Brazil some coaches believe that gymnasts must start too young, at four or five years old, to specialize in AG (Nunomura, Carrara & Tsukamoto, 2010).

Nunomura, Pires & Carrara (2009) detailed the AG Brazilian elite training, which amounts four to six hours in a day, 24 to 36 hours by week, all year long with few and short breaks. This amount of training seems to be required to gain the level of performance, necessary in AG, e.g., the continuous repetition of movements until gymnasts obtain consistency in performance (Tricoli & Serrão, 2005). However, studies have shown that competition is a factor that motivates athletes to remain committed to sports (Headstrom & Gould, 2004; Lopes & Nunomura, 2007; Weinberg & Gould, 2001).

Coaches' attitudes and actions may have a significant impact on athletes' interest and participation in sports (Headstrom & Gould, 2004; Weinberg & Gould, 2001). How often and well do coaches acknowledge and perceive athletes' motivation? Which strategies could increase the athletes' interest in and commitment to sports and decrease the level of dropout?

Motivation and sport practice

Apart from the physical and technical aspects, motivation would affect sports performance as well (Morrow, Jackson, Disch & Mood, 2000). Motivation is the key factor for a lifelong and athletic career. In other hand, dropouts are defined, in this paper, as those athletes who have terminated their athletic career prematurely, i.e. before they have reached their full potential. Achievement seems to be the main reason for participation in physical activities (Gill, 1986; Weinberg & Gould, 2001; Winterstein, 2002). Some authors identify fun as one of the most prevalent reasons for children and teenagers participating in physical activity and sports (Gano-Overway, 2001; Lulla, 2004; Weinberg & Gould, 2001). Competition would be another potential reason for participation, as generally children tend to look for activities in which they are challenged and have opportunities to be successful in that sport (Chelladurai, 1993; Headstrom & Gould, 2004; Lopes & Nunomura, 2007; Weinberg & Gould, 2001).

It is essential that the motivational level remains high to avoid dropout due to the demands of training (Krane, Greenleaf & Snow, 1997). Motivation to achieve success is the ability to experience pride or self-achievement, as well as shame or humiliation as a consequence of failure (Gill, 1986), while motivation for outcomes is the desire to keep or get better results in a higher level (Cox, 1994).

Intrinsic motivation is the driving force that keeps youth involved in sports (Cox, 1994). The challenging nature of sport and competition is rewarding, as athletes cope with their own limits and there is no relation with extrinsic rewards (Tresca & De Rose Jr, 2000). Even though intrinsic motivation is critical, in some situations external motivation in the form of recognition and material rewards may be more influential. Another important extrinsic factor is parental influence, which has significant impact on children and youth sport participation (Headstrom & Gould, 2004). Friendship is yet another main motivational factor in youth sport (Douge, 1999).

Athletes may doubt the worth of their efforts; particularly when situations are hard and they need to identify reasons remain committed. The dropout phenomenon can only be understood as a multifaceted concept event. From the athlete's point of view both internal and external factors can be effective. There are factors associated with dropout. Some studies point to the external conditions to which athletes are submitted and the strict selective nature of the procedures used in some talent identification programs. Robertson (1987) also cites lack of interest and focus on another sport, negative influence of coaches, and other factors. Specifically, if self-motivation is low, it is more likely that an athlete will drop out of the program. Thus, it is essential that those athletes be provided with extra reinforcement and encouragement (Morrow, Jackson, Disch & Mood, 2000). Dropout in the early years may not only be disruptive to a promising career, but it can also negatively affect the commitment to lifelong physical activity.

Artistic Gymnastics and motivation

It is impossible to achieve success in AG training and competition without an adequate level of motivation (Smolevskiy & Gaverdovskiy, 1996). The training demands a high volume of repetition to reach perfection, which may require a commitment of up to six hours per day (Arkaev & Suchilin, 2004). To attain the highest level requires about eight to ten years of training for girls and ten to twelve years for boys (Smolevskiy & Gaverdovskiy, 1996). Therefore, the monotony and stress of training and competition are almost inevitable. Thus, psychological preparation is essential in the training process, where the objective is to develop the morale and the willingness necessary to be truly committed to AG (Gajdos, 1983). This requires that athletes be regularly stimulated in order to optimize training and avoid potential dropouts (Lopes & Nunomura, 2007). These values reinforce the necessity of an ego-oriented motivational climate (Krane, Greenleaf & Snow, 1997).

It has been speculated that early specialization is needed to achieve the highest level in AG, as gymnasts' capacities are trainable when very young (Léglise, 1998). In general, female AG athletes achieve their best results during adolescence; the age range is a little older for boys (Arena, 1998). However, several outstanding gymnasts have begun careers later and reached their peaks beyond the age predicted by the literature. A notable exception is one of the Brazilian gymnasts in the Beijing Olympic Games who started systematic training at 11 years old.

Other factors may affect motivation in AG, like unknowing or neglecting its demands, the heterogeneity within the group, and the lack of challenging situations or demands of the tasks.

The performance aspect in sports psychology is not limited to elite athletes (Morrow, Jackson, Disch & Mood, 2000). Even though AG is not professionalized, gymnasts may be submitted to the same pressures and demands faced by adults. Younger practitioners may find it difficult to overcome the stresses of competitive environment. Therefore, it is essential to develop strategies to foster their enthusiasm, as in extreme training circumstances dropout may occur (Watts, 2002). An ego involved motivational environment was developed and reinforced by the gymnast's coaches and parents.

Coaches' Perception of motivation

In the training process, coaches must consider the psychological characteristics of each athlete and evaluate personal features such as the motivation for the activity, self-evaluation, goals, and morale (Smolevskiy & Gaverdovskiy, 1996).

The psychological aspects of coaching gymnastics are often related to the pedagogical or educational side of the activity. In fact, the psychological tasks of coaching are diverse and complex (Smolevskiy & Gaverdovskiy, 1996). An essential aspect of training process is psychological orientation. Its purpose is to guarantee that the performance achieves consistency and stability (Arkaev & Suchilin, 2004). The intrinsic motivational orientation is most likely to keep gymnasts committed to AG (Lopes & Nunomura, 2007) and coaches should look for strategies based on this finding (Readhead, 1997).

This process is necessary to motivate gymnasts, to optimize training, and to prevent dropout just before the peak of performance. Comprehensive understanding of the motivational factors that keep children and youth committed facilitates the establishment of goals and contributes to the creation of training strategies that reduce dropout (Lopes & Nunomura, 2007).

To maximize performance, coaches must understand the factors that can influence the learning process and perform as motivators, inspiring and encouraging their gymnasts to exceed their potential. Also, coaches should ensure the adequacy of physical and psychological preparation. Finally, coaches must ensure that gymnasts have sufficient motivation to execute a

movement without failure (Smolevskiy & Gaverdovskiy, 1996).

One of the reasons that coaches do not coach AG in Brazil is that they are not able to cope with the low levels of motivation seen in gymnasts. This is particularly true when gymnasts are entering an intensive training, according to female gymnasts' coaches in Brazil (Nunomura, Okade & Tsukamoto, 2009). Is motivation in AG an issue that coaches recognize and understand? Given that motivation in AG is an area of concern, how do coaches motivate their gymnasts?

The purpose of this field-based study was to analyze (a) how coaches perceive their gymnasts' motivation and reasons to be committed to AG, (b) describe the circumstances under which coaches think these reasons may lead to dropout, and (c) in such cases describe which strategies coaches apply to increase athletes' interest in and commitment to sports and decrease the level of dropout.

METHODS

Participants

Forty-six AG coaches, from 29 of the most important training centers in Brazil, affiliated with the Brazilian Gymnastics Confederation, were interviewed. Twelve coaches are coaching male gymnasts and 34 female gymnasts. The average coaching experience of the coaches of female and male gymnasts was respectively 12.2 ± 5.7 and 14.5±7.5 years. The gymnasts' average age was 11.16±2.3 years. The female gymnasts spent an average of 12 to 24 hours training per week, and male gymnasts spent from 11 to 28 hours training per week.

Procedures

The selection criteria for coaches were based on their traditional participation in States and National official events and were extended to those coaching gymnasts competing at the pre-elite levels. Coaches and their supervisors were contacted with a formal letter prior to the interviews. The purposes and procedures of the study were detailed to the participants. All interviews were conducted, by one author, during six months in workplace according to the coaches' requests and an office out of the view of others was chosen for privacy.

Research Design

A qualitative approach and deductive analysis were adopted for this study. Coaches were interviewed individually using a semi-structured interview guide. Coaches were asked about their gymnasts' motivation, their problems regarding dropout, and strategies to keep gymnasts committed to the sport. Example questions are: "Why do the gymnast stops to practice?", "How do you motivate them to keep training?"

A script was used to guide the interviews, subjects were voice recorded, and their narratives were transcribed verbatim. Each interview lasted for 42 to 88 minutes. Interviews were guided by the following issues: whether gymnasts have problems with motivation; whether they quit training; and which strategies coaches apply to keep gymnasts committed to AG.

Research Measure

Content analysis, appropriate in studies related to motivation, attitudes, values, beliefs, and trends (Bardin, 2001), was used for data treatment. The first part of the method consisted in the treatment of gross data (reading the interviews) and the codification process, where data were divided into meaningful segments of information (data reduction into units of meanings). A detailed examination of the data was done to identify topics that best described particular segments of text, emerging categories (as in the results). Units were categorized according to their context and common features that characterize the text segments and the relationships among them. The main researcher and another experienced content analysis researcher identified discrepant findings. A peer categorization and content analysis were adopted in order to avoid any bias or trends

that would lead to misjudgment or misinterpretation of data (Patton, 1987).

RESULTS AND DISCUSSION

Coaches' report were categorized and segmented into the following subthemes: Problems with Motivation, Reasons for Dropout and Strategies for motivation.

Problems with motivation

Seven coaches of female gymnasts reported problems with dropout, as gymnasts neared or entered puberty: "Body changes completely during puberty, the gymnast can't do the skills she used to, start to be indifferent, than it is not important in their life anymore." "In pre teens they have questioned more if that's what they want, is the most critical phase." During puberty, gymnasts may experience emotional difficulties due to the many changes in body and mind; coaches should understand and discuss them (Readhead, 1997). Particularly during adolescence, it becomes necessary to raise gymnasts' motivational level to look for achievements (Arkaev & Suchilin, 2004; Weinberg & Gould, 2001).

According to some coaches, participation in competition may be two-folded. If gymnasts participate, it's motivating to practice: "two competitions in a year are not enough. It's hard to motivate children this way"; if there is pressure and too much competitions, it's a problem because: "Have to train everyday, Saturday, sometimes holidays if there's a competition, and some don't understand this." "They are tired with the competition". A potential problem regarding motivation occurs when gymnasts enter intensive training, where the level of commitment increases, along with the demands and pressures of competition (Nunomura, Okade & Tsukamoto, 2009). Therefore, the need to increase motivation to achieve positive results is evident (Arkaev & Suchilin, 2004). Two coaches of female and one coach of male gymnasts reported no current problems with dropout.

Reasons for Dropout - Intrinsic Factors

The category was separated into intrinsic and extrinsic factors. According to the female gymnasts' coaches, intrinsic motivational factors exceed the extrinsic ones. The main intrinsic reason reported by the coaches was lack of interest, followed by gymnasts' perceived lack of potential for AG: "They preferred to try another sport." "You even need to say, she knows that isn't going forward, so she gives up." Regarding this issue, lack of interest was less significant to the coaches of male gymnasts than it was to female gymnasts' coaches. The main reasons reported was *(i)* perceived lack of talent for AG, *(ii)* not knowing the demands of AG, and *(iii)* lack of social activities. The extrinsic factors were the same for females' coaches, but also included lack of infrastructure, incentive, and rewards. Those reasons very closely resemble the data in the literature and also appear as factor in others sports (Gano-Overway, 2001; Lopes & Nunomura, 2007).

(i) In respect to perceived potential athletes may quit when they notice no development, no chance of improvement, or they have no expectations or goals in their respective sports. Authors believe that children look for activities in which their chances to achieve success are higher (Chelladurai, 1993; Gaya & Cardoso, 1998; Weinberg & Gould, 2001). The selective process in competitive sports and the comparison among gymnasts may frustrate those who have not achieved the same level of development and results. These factors, combined with the demands and the competitive level of AG may lead to dropout. This could be mitigated by splitting the group according to competitive categories and having different objectives for every group or gymnast. The objective should be as realistic as possible or frequent failures could cause gymnasts to drop out (Readhead, 1997).

(ii) The demands of training and competition and their results may work on two levels. In one way, the pressure might motivate the gymnasts to improve even more after each successful event. On the

other hand, gymnasts may quit due to subsequent failures or because they did not meet their own expectations (Miranda & Ribeiro, 1997; Lopes & Nunomura, 2007). According to the literature, the strictness of training during the transition from beginner to advanced level may be partly responsible for dropout in some sports (Silva, Raposo & Frias, 2005). This should not happen in AG, as the technical development should occur in a progressive and continuous process (Arkaev & Suchilin, 2004; Smolevskiy & Gaverdovskiy, 1996). Therefore, coaches have to offer support and make sure that each athlete is mentally ready to deal with the requirements and demands of the sport (Readhead, 1997). In other words, coaches should be mindful of any signs of dropout within athletes and adjust the training level and pressures upon them.

Some coachers reported that children start AG believing that they can easily learn the complex acrobatics: "When they realize that the process takes much longer than expected, they get disappointed." Coaches should consider the differences among athletes' personalities and attitudes and use different strategies to keep then committed (Smolevskiy & Gaverdovskiy, 1996).

(iii) One critical fact that finds support in the literature is the lack of social opportunities in competitive sports. Contrarily, the competition itself can be an opportunity for social promotion in Brazil (De Rose Jr, 2002). Relationships seem more demanding and complex among adolescents, as they are developing self-confidence and ensuring social roles (Bee, 1997; Gano-Overway, 2001). Then, sports participation should provide athletes with many opportunities to develop socially, learn responsibility and cooperation, and manage their personal daily schedule and goals in sport.

Some coaches reported the social relationship as a reason to stay committed to AG. The social circle will be limited to sport mates as commitment to a sport increases (Chelladurai, 1993). Therefore, relationships among athletes become even more important reasons to remain in or drop out of a sport (Fraser-Thomas, Côté & Deakin, 2005). Some other factors reported by the female gymnasts' coaches were: difficulties to return to the training after long holidays; psychological changes associated to the beginning of the puberty; lack of knowledge of AG and its requirements, and difficulties in dealing with school activities and parental influence.

Reasons for Dropout - Extrinsic Factors

The extrinsic factors were interest in other activities, demands of training and competition, and lack of family support: "They aren't able to conciliate with school." "Problems with parents, who think that's too much and will ruin in school." Regarding parental influence, some coaches have reported that many parents believe sports may affect a child's performance at school. Parents may influence values and interests among athletes, particularly during the beginning of adolescence (Gano-Overway, 2001; Headstrom & Gould, 2004). Particularly for girls, adolescence involves many physical and psychological changes that may influence the decision to abandon the sport. Difficulties coping with weight gain and the acceptance of a "new body" may generate a lack of self-confidence that if not well managed, may lead to drop out.

Other less cited reasons for drop out were lack of competition, appropriate infra-structure, and financial support. The first reason is questionable, as there is a high volume of competition and including different skill levels. Coaches should remember that competition is an important motivational factor for sports participation (De Rose Jr, 2002), and they have to balance the volume of events throughout an athlete's career (Weinberg & Gould, 2001).

The lack of support reported by male gymnasts' coaches is related to the perspectives of those selected for the national team and the lack of financial support to train and compete. The association of sport with financial support was more frequent among coaches of male

gymnasts. The fact that the average age, probably of the age of dropout, of a significant number of male gymnasts coincides with the age at which many young men start work in Brazil may be a key factor.

Strategies for motivation

The categories were separated into the following two themes: *(i)* goal-setting and *(ii)* extrinsic motivational strategy. The goals most frequently cited by female gymnasts' coaches were to create means of communication, to change some pedagogical issues of training, and to nurture self-assessment skills: "I try to talk with them and when they start to give up, I talk to the parents too, if parents don't help me, children will get out." The extrinsic strategies recognized by coaches were to increase the number of events, to provide more financial support, and to offer rewards and reinforcement: "to reward new elements the prize is money."

Those strategies were also cited by male gymnasts' coaches, who added the need for careful selective procedures for incoming competitive groups: "We try to select those who are auto motivated, who like AG." To some degree, those strategies are related to athlete dropout, and reveal where coaches should focus to avoid further problems.

(i) The majority of coaches reported good communication and relationship as motivational strategies: "We do a very clear work in technical preparation, explaining the AG requirements to them." This practice is healthy and productive, therefore it approaches coach and athlete, new ideas and necessities appear and disclose the importance of reflection and eventual changes of attitudes in training and competition (Readhead, 1997).

However, those strategies are ways for coaches to express themselves rather than listen to athletes and offer an opportunity for gymnasts to express themselves and share decisions. Improved communication and relationships among athletes are always welcome, as this creates a pleasant and comfortable environment for open communication.

Strategies relating to feedback of performance in training and competition, rewards and positive reinforcement, and more participation in events, all find support in the literature (Graham, 2001; Lopes & Nunomura, 2007; Weinberg & Gould, 2001).

Making athletes conscious of their goals, achievements, and potential, teaching them to set goals and giving them praise help to improve their self-esteem and increase their motivation (Selk, 2004). The objectives must be sufficiently demanding and challenging to gymnasts, allowing them to feel satisfied and motivated to accomplish higher objectives (Readhead, 1997).

An interesting strategy reported by one coach involves offering challenges regularly, which acts in favor of self-achievement, and thus has a positive effect on motivation (Gano-Overway, 2001). Beyond physical and technical aspects, motivation and desire could affect sport performance (Morrow, Jackson, Disch & Mood, 2000).

Another noteworthy strategy involves selecting those athletes who show the desirable profile for AG: passion for AG and intrinsic motivation. Coaches did not mention how to identify these aspects. Many children start with a high level of intrinsic motivation, but it can be suppressed by negative experiences in the sport (Lopes & Nunomura, 2007). Coaches should be sure that gymnasts have adequate physical and psychological preparation (Arkaev & Suchilin, 2004), sufficient motivation to perform a movement, and limited failures (Readhead, 1997).

(ii) Competition can also increase the level of motivation if it's meaning and reasons for participation are clear to the athletes, and it aims at self-assessment and not mere comparison.

Some attention is needed with respect to the material and financial rewards cited by some female gymnasts' coaches, as these should not become athletes' goals. One coach reported that, occasionally, he would

offer money when a gymnast performs well a new skill. Another coach told his gymnasts that they were better compensated than working civilians. Both cases raise a red flag: when a sport is considered a job, the pressures associated with it become the focus (Robbins, 2002).

As athletes grow, financial support seems to be even more important to male gymnasts, given their need to be employed. Some coaches offer financial incentives such as reduced school fees in an attempt to keep their gymnasts. Unfortunately, there are few rewards in public institutions. Even though literature cites the importance of knowing the reasons that bring and keep athletes committed to sport (Gano-Overway, 2001; Martens, 1987), not all coaches show concern about this issue. Some coaches plan their programs according to their beliefs and interests, rather than consider too the needs and interests of athletes.

An important aspect, but not cited by any coach, is enjoyment of sport, especially for children; unlike coaches, much literature cites fun as the main reason for sports participation among children (Gano-Overway, 2001; Lulla, 2004; Watts, 2002; Weinberg & Gould, 2001). The promotion of autonomy and responsibility were not cited by any coach as a motivational strategy either, even thought this is considered an effective one (Gano-Overway, 2001; Martens, 1987; Posner, 1992).

The reasons for dropout cited by both female and male gymnasts' coaches find more support in general sports literature than in literature focused on gymnastics. Thus, AG has similar problems regarding motivation of athletes.

Some considerations are the early average age that gymnasts start training and competing, in comparison with some other sports. Therefore, some strategies may not be widely applicable; children do not value the financial rewards that adolescents and adults may. Older athletes are more conscious of their potential and career perspectives and are more task-oriented (Duda & Gano-Overway, 1996). Meanwhile, children need more emphasis on fun, recognition, approval aspects and variability of practice; and a program designed to ensure that their youth have positive experiences (Fraser-Thomas, Côté & Deakin, 2005).

CONCLUSIONS

Motivation is influenced by gender, age, and technical level of gymnasts. Girls and boys may change interests, particularly when entering puberty, and different approaches should be used to behave in the face of AG adversities (Krane, Greenleaf & Snow, 1997).

Therefore, coaches should use a wide range of motivational strategies to encourage gymnasts, as their needs and reactions vary much. The literature can support coaches in this regard. It would be interesting to make individual annotations out of the emotional characteristics of each athlete. This could help coaches to understand and monitor each athlete's behavior and eventual changes.

Coaches should use those approaches: have regular communication with athletes` parents, as they can be very informative; evaluate athletes' levels of satisfaction as a source of information regarding athletes` interests and needs, their reasons to participate, and objectives in the sport. Coaches and parental support are essential to maintain high levels of motivation and to avoid further emotional disturbances due to possible negative experiences as a result of a gap in interests (Cumming & Ewing, 2002; Gano-Overway, 2001; Headstrom & Gould, 2004).

Coaches must adjust their beliefs and practices according to each athlete's psychological characteristics. Thus, coaches should always monitor their own attitudes and behavior in front of athletes, both in competition and training. Coaches are important adult modeling for athletes, as they spend much time with each other. Therefore, they are mentors who can significantly influence an athlete's decision to continue participating in sport.

An especially critical period for athletes and coaches is puberty, when physical and emotional changes may affect athletes' interest in the sport. It is important to understand this stage of life; if changes in strategies are necessary, they must be made.

If more attention is paid to the developmental process of preparation and psychological characteristics of athletes, both the commitment and performance of the athletes will improve. However, studies reveal a high level of dropout among children and youth worldwide (Gonçalves, 1999; Fraser-Thomas, Côté & Deakin, 2005). In Brazil, the AG scenario is not different, particularly when gymnasts are starting intensive training (Lopes & Nunomura, 2007).

Once they recognize the reasons that athletes remain committed to a sport, coaches soon realize that all participants, particularly children and youth, are not only interested in medals and victories. Some athletes seek merely the pleasure that the sport can offer. Sharing responsibilities and decisions, making friends, and developing a sense of self-achievement are also important considerations for athletes. At a competitive level, this is even more critical. Athletes may spend most of their time in function of training, and motivation becomes a key factor.

Finally, coaches deal with human beings who experience and express a lot of feelings and emotions. This fact should be considered in order to guarantee a certain level of success and self-satisfaction for all involved in the sport. This means having positive experiences, regardless of an athletes` potential and their outcomes in sports participation.

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DEVELOPING PRE-PERFORMANCE ROUTINES FOR ACROBATIC GYMNASTICS: A CASE STUDY WITH A YOUTH TUMBLING GYMNAST

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Original research article

Abstract

A mixed-method approach was used to examine the development and acquisition of a personalized pre-performance routine (PPR) by a male youth gymnast. The athlete completed the Test of Performance Strategies and participated in semi-structured interviews alongside video clips to examine PPR experience at pre and post intervention then at 6 months follow up. There was a perceived increase in the effective use of psychological skills post intervention. Moreover, the gymnast reported a consistent PPR prior to performance, demonstrating control and automaticity of his routine. The strategy used to develop the individual PPR and its potential use with young athletes more generally is discussed.

Keywords: *pre-performance routines, mixed methodology, case study.*

INTRODUCTION

Pre-performance routines (PPR) are a sequence of motor and cognitive behaviors performed immediately before the execution of self-paced tasks (Cohn, 1990; Lidor & Mayan, 2005; Lidor & Singer, 2000). For an athlete, the general purpose of a PPR is to take them to an optimally aroused, confident and focused state which then enables control over cognitive activity and emotions before, during and immediately after performance (Lidor & Singer, 2000). The design of PPRs with athletes is influenced by the sport itself, the nature of the required task, the athlete's skill level and individual pre-performance preferences (Boutcher & Rotella, 1987; Cohn, 1990; Ravizza & Rotella, 1982; Singer, 1988, 2002; Taylor & Wilson, 2005).

Researchers have shown that to effectively use PPRs in sport, athletes should acquire these techniques as early as possible during skill learning itself (LaRose, 1988; Lidor & Singer, 2000). Research has also shown that athletes need significant experience in their sport (i.e., indicative of a high training age) before using certain elements associated with PPRs as the acquisition of previous routines will enable them to incorporate further strategies, such as imagery techniques (Lidor & Mayan, 2005; Nevett & French, 1997). It has also been further suggested that novices are more likely to incorporate motor routines (e.g., physical rituals or mobilization of limbs) into their training before cognitive strategies (i.e., imagery and focus attention) because some experience is required to reduce the effect of information overload (Lidor & Mayan, 2005). However, Wrisberg and Anshel (1989) demonstrated a

significant result in performance efficacy with young basketball players (age: 10.2 – 12.4 years) by incorporating a arousal adjustment and imagery into a pre shot routine . Weiss (1991) also concluded cognitive strategies can be used with youth athletes and can have a positive impact when used with highly skilled young athletes. Relaxation techniques may also be used, but perhaps requires age appropriate adjustment for youth athletes in order to engage. For children and youth athletes imagery is a natural skill used in sport. According to Weiss (1991) imagery was reported by youth athletes in rehearsed skill sequences, competition strategies and in retention of newly acquired skills. Imagery exercises are therefore advocated for use with the assessment of intentional and motivational capabilities of youth athletes recommended as a stage to be conducted before imagery is developed (Callow & Roberts, 2010). In sports such as gymnastics athletes achieve expert performance when still young (i.e., have a low chronological age but high training age). Therefore, the athlete may have the experience but not the cognitive development required to implement PPR in their training program. In the present study, we examine the development and acquisition of a personalized PPR using a selection of cognitive strategies by a youth gymnast with a high training age but low chronological age.

Previous research examining the development and acquisition of a PPR by youth athletes is somewhat limited. An exception to this is Lidor and Mayan (2005; see also Lidor & Singer, 2000) who conducted a study with youth athletes. They examined the acquisition of motor and cognitive based PPRs in a group of sixty female novice volleyball players (mean aged 16.5 years). Participants were divided into three groups: motor preparatory routine, cognitive preparatory routine, and control (i.e., those who had no-motor or cognitive guidance) and followed three weeks of group based training focused on the serve. The motor routine was found to be more effective for performing the serve more accurately compared to the cognitive routine. The researchers explained that "the (motor) routine provided them (athletes) with the feeling that they were in optimal control of the movement execution, thus increasing their self-confidence during the serving performances" (p. 359). The authors also suggested that in order to introduce cognitive routines with youth athletes, more experience was needed by the players in the skill (serve) to reduce information overload and implement the principles of cognitive strategies (Lidor & Mayan, 2001). Findings demonstrated that the developments of motor-based PPRs with youth athletes are possible, but the acquisition of cognitive-based PPRs is more difficult for these athletes.

However, according to Lidor and Mayan (2005) recommend sport psychologists should search for the "best" components of a preparatory routine that most fit the individual's learning capabilities and skill level, which requires understand of the individual characteristics to compose a efficient PPR. In order to decrease the instructional load placed on learners, they further suggested teaching a routine through which the emphasis is on motor elements and only then to add preparatory components that emerge from a cognitive-oriented routine. The authors themselves were unable to test these suggestions regarding individualized PPRs in their study as a group (as opposed to individual) instruction format was used. Tam and Losdale (2007) also made reference to consistency in PPR concluding that athletes should be encourage to develop a consistent pattern of pre-performance behavior which their study founds was associated with greater accuracy. Cotterill's studies with golfers (2008, 2010) also suggests that future research should seek to explore the effectiveness of developing individually focused routines and their perceived impact upon preparation and performance. Although there are guidelines on how to conduct a PPR with beginners (Cohn, 1990) and young athletes (Lidor &

Singer, 2000), there is no practical research showing how effective the use of athlete capacities and sport nature together with cognitive strategies can be combined into a PPR.

A case study is an important preliminary step towards gathering such information and the present study's aim is to provide an in-depth understanding of the acquisition and use of PPRs in a youth athlete within real life context (Patton, 2002a) using quantitative and qualitative techniques. Subsequent findings could then be used to examine the training and development of PPRs in larger samples of youth athletes.

For the purposes of this study it was therefore proposed that the high training age of the study participant combined with the individualized program would result in an effective use of PPR linked with improvement in performance.

METHODS

Participant

The participant was a UK based 15 years old national grade male competitor from the discipline of acrobatic gymnastics (tumbling) selected by convenience (Bryan, 2008). The gymnast had a training age of five years and had been working with his current personal coach at the onset of the study for one year. He currently trained approx 12-15 hours per week with three hours each day. Informed consent was provided prior to participation and ethical approval was gained through the lead institution's Ethics Committee.

Design

The study was divided into five phases (see Table 1). The first phase (needs analysis) incorporated the Test of Performance Strategies (TOPS) (Thomas et al., 1999) to examine the participant's use of specific psychological skills; video recording of one training session (2.5 hours) to capture the participant' experiences and help the recall during interview and a semi-structured interview. The aim of the interview was to explore further and highlight examples of the psychological skills that the gymnast currently used in training and competition and explore how effective they were in these environments. The second phase (intervention development) was the development of a personalized PPR program. The third phase (intervention phase) was the implementation of the PPR program. The fourth phase (post intervention/ evaluation) was an evaluation of the PPR program effects by applying the instruments used in the first phase. Finally, the fifth phase (6 month follow-up/retention phase) involved re-administering the questionnaire and a follow up interview. The research used a mixed methodology that sought to incorporate both quantitative and qualitative approaches with quantitative methods (Gratton & Jones, 2004) used to inform the qualitative data collection.

Procedures and Measures

Prior to contact with the gymnast the participant was informed in writing of the purpose of the study, the study protocol and ethical issues relating to the use of data and anonymity. On receipt of participant, parental and personal coach consent a convenient time and day was set to video record a training session. A full and typical training session was video recorded with digital video cameras (Canon 3CCD Digital Video Camcorder XM2 PAL, Tokyo, Japan). Video recording clips were created using editing software (Sportscode Gamebreaker, Sportstec, UK Limited). The video clips were edited into a short sequence of events that would be used during the interviews with the gymnast. Here, six video clips were shown to the gymnast depicting three accurately executed skill 'runs' and three that fell short of this criteria with major judging associated errors. The gymnasts personal coach advised on the selection of these video clips and the aim was to assist comparison between the PPRs and recall these experiences.

Table 1. *Project Phases*

Phase	1	2	3		4	5
Timescale	April	April	May – July	July	January	
Procedure	*Needs analysis*	*Intervention development*	*Intervention phase*	*Post intervention/ evaluation*	*6 month follow-up/retention phase*	
Rationale	Exploration of psychological strategies employed by the gymnast.	Based on information revealed by TOPS (Thomas et al., 1999) and interview. Respect gymnast ways to learn. Use strategies that align with needs analysis and sport demands.	Implement a personalized PPR program over 7 weeks (4 sessions). PPR content: Imagery, Broad attention, narrow attention and cue word.	Evaluate use of personalized PPR program. Evaluate the effect of the procedure as a new methodology.	Evaluate retention and use of skills of the personalized PPR program after six months.	
Design	Quantitative Qualitative			Quantitative Qualitative	Quantitative Qualitative	
Measure	TOPS Video recording Semi-structured interviews (4) (+ clips) Familiarization of protocol for gymnast Researcher observation of training and familiarization with equipment	Representative of PPR. New PPR (Consult – efficiency, Refinement).	Gymnast's research dairy. Weekly feedbacks and observation.	TOPS Video recording Semi- structured Interview (+ clips) Gymnast's dairy	TOPS Semi- structured Interview	
Analysis	**TOPS:** Score representing the gymnasts use of psychological strategies in training and competition. **Video recording** = clip editing **Interview** = Verbatim transcription/ pen profiles	Physical rituals Gaze Mental strategies		**TOPS:** Score representing the gymnasts use of psychological skill and strategy training and competition. **Video recording** = clip editing **Interview** = Verbatim transcription/ pen profiles/ quotes to illustrate the research **Gymnast's research diary** = representative verbatim quotes to illustrate the research	**TOPS:** Score of the gymnast use of psychological skill and strategy training and competition. **Interview** = Verbatim transcription/ pen profiles/ verbatim quotes to illustrate the research	

The TOPS questionnaire was used to assess the participant's current use of specific psychological skills. Given the participants age, the questionnaire was administered co-operatively with author one to ensure clarity in understanding and completion. The instrument contains 64 items which describe the use of psychological strategies in a situation that athletes might encounter during training or competitions together with how frequently they actually use the skills. The mental skills constructs are those of goal setting, emotional control, automaticity, relaxation, activation, self-talk, imagery and attentional control. The competition section of the questionnaire includes the same mental skills with the exception of the item "attentional control" which is replaced by "negative thinking". The participant rated the frequency of his psychological skills usage on a five-point Likert scale anchored at one (never) and five (always). The maximum raw score on each subscale session of TOPS is twenty and a high score indicates a greater use of mental skills in the training or competition environment. Reliability coefficients for this test have been reported to range from 0.86 to 0.93 (Thomas et al., 1999). Reviewers have also agreed on the validity of the instrument's content (Goudas, Kontou, & Theodorakis, 2006; Harwood, Cumming, & Fletcher, 2004; Lane, Harwood, Terry, & Karageorghis, 2004).

Following completion of the TOPS, four semi-structured interviews were conducted to expand on responses within the questionnaire in order to gain in-depth information and understanding of the psychological strategies and other elements (i.e. physical rituals) used by the gymnast before his performance. Following procedures successfully adopted by other authors (Ravizza & Rotella, 1982) the type of questions incorporated into the guide and structure were developed through discussions with author three who was experienced in sport psychology consultancy with junior athletes and coach of elite artistic gymnasts.

The interviewer (author one), had previous experience in qualitative research and experience as a participant in artistic gymnastics, was trained to perform the interview. Prior to data collection, a familiarization session was conducted including the use of video and enable the interviewer to practice the interview/video combined technique. The interview structure emerged from the responses revealed by the TOPS scores and the video clips. During each interview the participant was asked to respond to the questions based on his current use of preparation strategies in training and competitions while watching the clips from the laptop to stimulate recall analysis (Gardin, 2010; Nicholls et al., 2006). The interviews lasted on average of 36 minutes each, were conducted over a period of three weeks, were taped recorded and transcribed verbatim for the purpose of data verification (Lincoln & Guba, 1985).

The second phase (intervention development) of the program focused on the development of a personalized PPR for the gymnast using information revealed by the TOPS and interviews. This was designed by drafting and re-drafting a representative PPR, identifying strategies for the gymnast taking into account personal characteristics and nature of the sport (i.e., self-paced, speed). The analyses of the first phase (needs analysis) revealed that the gymnast was already engaged in a highly consistent PPR characterized by physical ritually based movements however mentally was only using imagery as part of this routine. The gymnast was experiencing debilitative symptoms associated with negative thoughts while preparing to perform in both competition and training.

Additional information revealed by the questionnaire, such as the consistent use of imagery and the presence of negative thoughts was taken into account to develop a personalized PPR for the gymnast (see Table 2).

The interviews suggested that the gymnast was having difficulties in focusing his attention (i.e. where to locate his gaze during his preparation to perform) and

eliminating negative elements and distractions to think on the tumbling sequence or 'run'. The psychological strategies utilized in the PPR program were thus a sequence of imagery (an internal image of his 'run' characterized by the sensations felt and the images seen), broad attentional focus (associated with end of the track) shifting to narrow (linked with initial hand placement on the track) and an energizing cue word (i.e., "Come on!"). The physical components of the routine remained the same (e.g., arms position extending in front of the body and dry his hands 3 times).

Table 2. *Measures obtained by the application of the TOPS (Phase one).*

Psychological skills and strategies	**Practice** Needs analysis phase 1	**Competition** Needs analysis phase 1
Activation	9	9
Relaxation	4	4
Imagery	14	11
Goal Setting	18	11
Self Talk	6	7
Automaticity	8	10
Emotional Control	12	12
Negative Thinking/ Attentional Control	15	20

Note. Maximum score for each subscale session = 20.

Once the PPR training program was established, the third phase was implemented over a seven week period. The implementation of the program was conducted by author one. To introduce the PPR and assist the gymnast on its integration into training, meetings between author one and the gymnast were held each week for approximately 30 minutes each in the first four weeks. Each PPR strategy (imagery, attention and cue word) was trained separately in each of the first four weeks followed by the whole PPR training in the remaining weeks. The final three weeks were monitored by the author one via telephone and training observation in order to both support the gymnast in his PPR training and gain feedback from both the gymnast and coach. A 'home task' (using clips from the previous video recorded training session and the PPR training) was also set for the gymnast to undertake at home in order to complement his PPR practice. A diary was completed by the gymnast to record his experiences and reflections during the investigation period. He was requested to date all entries and write in his own style (words) following a guided structure format: description of the activity; feelings; evaluation (what was positive and negative); conclusion (suggestions). The diary was used during the Intervention phase meetings and final interview in order to facilitate the gymnast to reflect and recall his PPR training experience.

The fourth phase (post intervention/ evaluation) was conducted to record the training, complete the TOPS and conduct a final interview for evaluation immediately after intervention. This phase was conducted by the same researcher following the procedures described in the first phase. Finally, the retention phase was conducted after six months following a competitive phase and incorporated the completing again the questionnaire and an interview to evaluate the retention of skills and application of the routine following the removal of support/intervention by author one.

Data Analysis

Descriptive statistics were calculated for the TOPS to explore the use of psychological skills by the gymnast. Firstly, the raw score was calculated in order to demonstrate the psychological skills used by the gymnast. Secondly, the increased change of the score was calculated to present the comparison between post-intervention and retention phase of the questionnaire following the sequence present in the table one.

In the current study, several methods were used to enhance the trustworthiness of the data proposed by Lincoln and Guba

(1985). The interview guide, which was based on the findings from the TOPS and video clips, provided a deductive analytic framework. Thereafter, analysis of the interview data involved moving back and forth between deductive and inductive approaches. This movement allowed for both the verification of deductively driven research question and the exploration of inductive findings that emerged from the multiple interviews (Patton, 2002b).

Pen profiles were firstly constructed from the transcripts of phases fourth and fifth. These profiles provide a composite of key themes from the data at post intervention/evaluation and retention phases (Ridgers, Knowles, & Sayers, 2012; Mackintosh, Knowles, Ridgers & Fairclough, 2011). Verbatim quotations were used directly from the transcripts in order to expand the pen profiles. These extracted quotes, or a statement made by the subject, were self definable and self delimiting in the expression of a single recognizable aspect of the subjects' experience. The consultation process took the form of a presentation by first authors in which the pen profiles and verbatim quotations were demonstrated to the third author an experienced researcher familiar with qualitative research techniques. The researcher critically questioned the analysis then interrogated the data independently tracking the process in reverse from the pen profiles to the transcript. A further meeting allowed the researchers to offer alternative interpretations of the text or profile. This process continued until acceptable consensus had been reached.

Credibility and transferability (qualitative equivalent of internal and external validity respectively) were demonstrated through verbatim transcription of data and inter-researcher consensus procedures. Dependability (qualitative equivalent of reliability) was demonstrated through the comparison of pen profiles with verbatim citations and triangular consensus processes (Knowles, 2009). The qualitative themes and quantitative data subsequently formed the basis of the discussion. Quotations from the interviews and athlete's diary were selected to illustrate the research phases (Faulkner & Biddle, 2004).

RESULTS

The aim of the research was to provide an understanding of the acquisition and use of PPRs in a youth gymnast. Scores for post- intervention and retention phases of the TOPS are provided in table three and revealed that the gymnast maintained a consistent use of the psychological strategies during training. However, in competition he had a profound increase (100%) in using relaxation and a decrease (47%) in negative thoughts, corroborating with interview based data. It should also be noted that the gymnast did not have competitions during the implementation of the program due to unforeseen circumstances however data collected after six months (retention phase) was completed following a competitive phase within his annual program. The analysis of the interview responses yielded eight raw data themes in the post- intervention (Figure 1) and five key themes in the retention phase (Figure 2) that suggested perceived effectiveness of the PPR according to the gymnast. The current authors have reported the interview results based on a selection of direct quotations to illustrate the variety of responses obtained. This offers a considerable advantage by allowing the gymnasts "voice" to be heard and enabling the reader to gain understanding as to the experiences and issues involved via the participants' words.

PPR program development

The PPR was developed in accordance with the current pre-performance routine of the gymnast which was characterized with imagery techniques and noted a persistent appearance of negative thought. With regard to the latter the gymnast described himself as despondent and perceived he was viewed negatively by others (i.e., coach, previous coach, judges, and competitors). The design of the routine considered sport

characteristics such as power and explosiveness. A sequence of specific cognitive strategies was incorporated into the PPR to assist the gymnast in coping with uncontrollable situations immediately prior to his performance. Even though relaxation appeared a critical issue for the gymnast, it was not appropriate to incorporate relaxation techniques into the routine per se as he perceived explosion and activation were essential characteristics to complete the sequence of complex skills. The gymnast also requested to use anxiety to assist him during perceived pressure situations. As a result a cue word was incorporated in his PPR firstly to help the gymnast to avoid negative distractions and secondly, to permit him to achieve an optimal right arousal level.

Table 3. M*easures obtained by the application of the TOPS at Post intervention/ evaluation (phase 4) and 6 month follow-up/retention phase (phase 5).*

	Practice			Competition		
Psychological skills and strategies	Needs analysis	Post	Percentage Increased (%)	Needs analysis	Post	Percentage Increased or Difference (%)
Activation	12	12	0	12	14	16
Relaxation	6	7	17	7	14	100
Imagery	18	18	0	18	20	11
Goal Setting	18	20	11	18	18	0
Self Talk	13	13	0	14	11	-21
Automaticity	11	11	0	10	9	-10
Emotional Control	15	16	7	15	16	7
Negative Thoughts/ Attentional Control	16	17	6	17	9	-47

Note. Maximum score for each subscale session = 20.

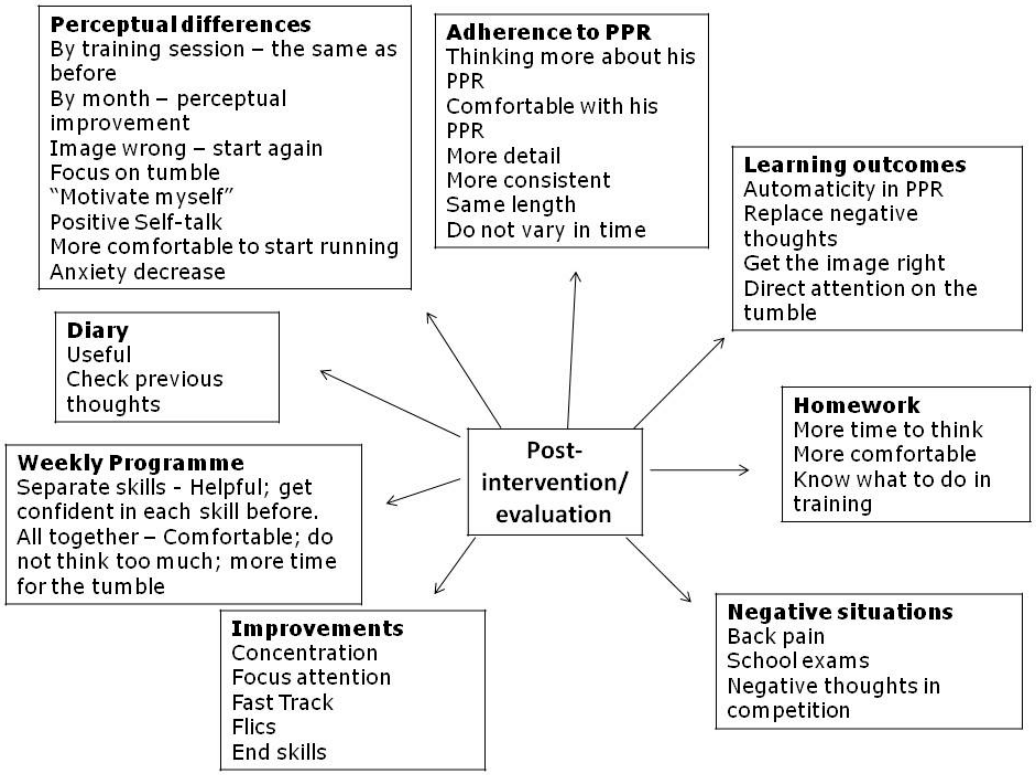

Figure 1. *Pen profiles from post-intervention/evaluation.*

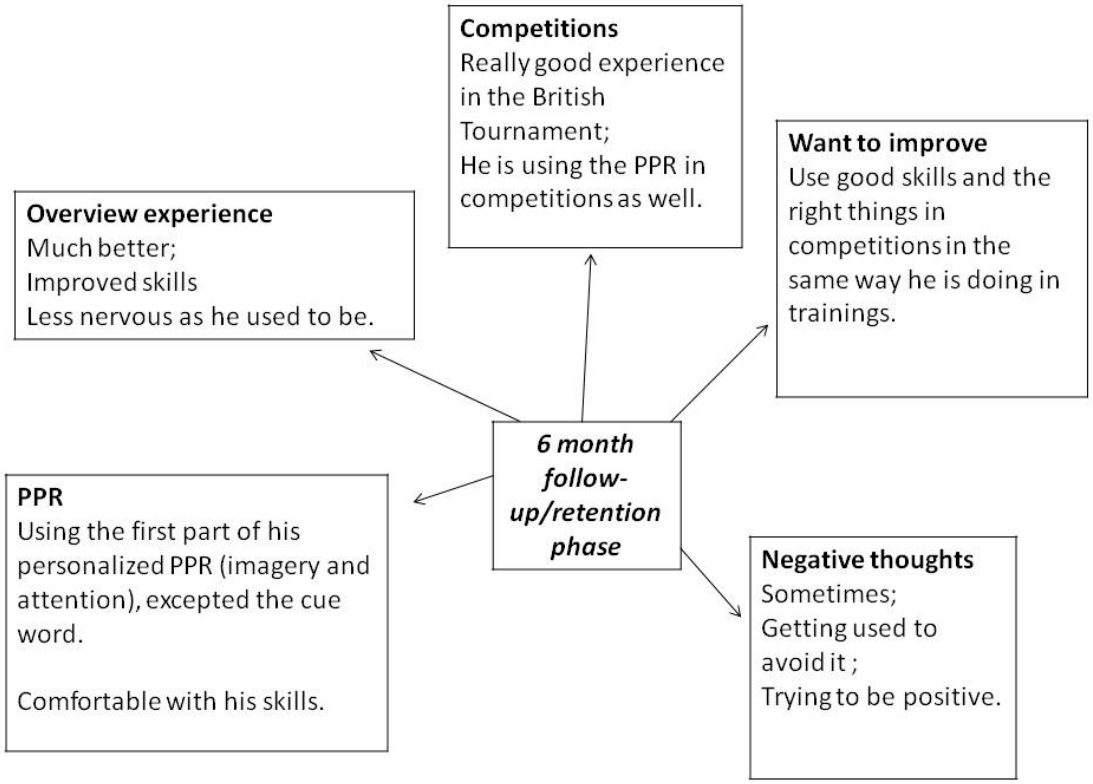

Figure 2. *Pen profiles from 6 month follow-up/retention phase.*

Individual skill training

The gymnast familiarized himself with each PPR element before progressing towards a comprehensive routine comprising of several elements in sequence demonstrating independent control and automaticity of these skills. He stated:

Well, because the way we did, like we did a bit and then we trained, so I got to be confident on that; and we did the second part and got more confident and then when we put all together, I did not have to think about it too much. I could think about my run. But if I had put all together straight away I would have thought about that and not about my run. (Post-intervention)

Outcomes of the PPR program

A PPR induced optimum state was achieved through a gradual process and the gymnast, with time, learned how to obtain this state prior to performance. It was assumed that the PPR provided him with the feeling that he was in control of movements increasing thus, his self-confidence and performance at the time of post-intervention. As an illustration, the gymnast commented:

It was different, because I do not really like to say words before my runs, and at home I do not usually think about it before I go to sleep. So it was different, but was not wrong in doing it and all seems to be working, because I am getting better. (Post-intervention)

I think my PPR are more consistent. I think it is making my tumble more consistent. I think about PPR and it makes me a little more confident that I will do it, because if I think about my run in my head and I have done it in my head, so I just need to do it and relay. So it is kind of motivating me. (Post-intervention)

Of particular importance here are the statements that demonstrate how the strategy was developed through the 'home task' and application made within training:

I took my video; watched it; then turned it off and imagined different routines. I felt as if I was actually in the gym. (Diary)

Before, I never used to say things to myself. And now I do think about things to say to motivate me. (Post-intervention)

When exploring the impact of the PPR program six months after the initial evaluation including training and competitive situations, the routine had, at this point, changed in composition for example he had eliminated the cue word, but the routine was regularly used by the gymnast in a comfortable and automatic manner. The gymnast stated:

I do not think about it anymore. I use it (PPR), but I do not notice that I am using it. So, it is like I am using it, but I do not think about it. I think about the routine and everything, but I do not think that I am thinking about it, if you know what I mean. It is natural. (Retention phase)

Clearly the PPR may have had a greater influence on the gymnasts preparation in general during training and in the competitive environment and this was supported by comments about his difficulties related to negative thought:

I think sometimes, but I am getting used to avoid it and just forget it. I do not think too much. Not really. I am trying to be positive. (Retention phase)

Although young in chronological age, the participant was experienced in his sport (i.e., a possessed a high training age) and this may be necessary to facilitate acquisition of a PPR. According to the gymnast in this study PPR fostered improvement of psychological skills and a perceived decrease in the anxiety. Allowing for the uncontrollable environment, the psychological strategies learned by the gymnast proved to be effective as he stated:

It (performance) is much better; because in the last competitions I have not been nervous with anything. I have not been that nervous and it is very good. (Retention phase)

I am happy and not scared like I used to be. (Retention phase)

DISCUSSION

The aim of this study was to develop and implement a personalized PPR training program for a youth gymnast and evaluate, via the gymnast's own perceptions, the impact of the routine on his training and performance. The present study is perhaps the first to explore and consider in detail each individual psychological skill independently before combining into a pre performance 'routine'. It was anticipated that the intervention would facilitate the experienced youth gymnast to develop and then incorporate a PPR in both training and competition. Indeed, the gymnast reported improvement on his preparation and performance in training and competition as a result of this program.

The needs analysis and intervention development phases of the research allowed assessment of the gymnast's personal and sport characteristics which in turn informed a more appropriate analysis of critical elements in his current routines and, hence, the option to maintain or replace it (Boutcher & Rotella, 1987). Results from previous research indicated that watching video recordings/clips of performances and reflecting back on positive experiences could be used as a mental preparation technique (Gould, Finch, & Jackson, 1993). However, the present study used video clips in combination with interview to aid recall, capture the attention of the young gymnast and facilitate conversation with the researcher to explore experiences.

The PPR developed had the intention to buffer the negative thoughts and focus the gymnast on the task, i.e. tumble run (Cohn, 1990; Cohn, Rottela, & Lloyd, 1990; Mallett & Hanrahan, 1997; Mesagno, Marchant, & Morris, 2008). Unlike previous research (Foster et al., 2006; Lidor & Mayan, 2005; Wrisberg & Anshel, 1989), the PPR in this study was implemented by having each skill trained separately before incorporating into a routine. The results demonstrate that perhaps this strategy could be effective in enabling a young athlete to have control and automaticity of their

routines and thus focus on the current task (Lidor & Singer, 2000; Ravizza & Rotella, 1982).

The process of learning and applying new psychological skills requires time and persistence by the sport psychology consultant and the athlete. The present findings demonstrated a consistent effort by the gymnast to the elements learned in order. The findings also reinforced the contentions of Wrisberg & Anshel (1989) who stated that young athletes are particularly motivated by opportunities that promote skill development and young athletes are able to learn and use cognitive techniques to enhance their performances (LaRose, 1988; Lidor & Singer, 2000; Weiss, 1991). Nevett & French (1997) also stated that when children possess sufficient sport knowledge, they can produce planning strategies.

With regard to the efficacy of the PPR for a young athlete, the results are clearly satisfactory. The gymnast perceived improvement in both preparation and performance (in training and competition) and these were consistently support by his comments on the interviews at the post-intervention and retention phases. This suggests that following conclusion of the project the gymnast continued to refine and develop his skills further though without specific guidance via contact with the researchers. Concentration, consistency in preparing to execute the task and security in following the complexity of his training were also reported as improvements by the gymnast (and supported by his coach). At an applied level, the findings presented here support and further enhances Cohn's (1990) suggestion that PPRs should be structured for each individual within his or her specific sport. A variety of individual preferences should be considered when formulating PPR (Lidor & Mayan, 2005). These preferences may include perceptual learning styles, general anxiety or arousal levels, and pacing of the routines all of which are important to facilitate adherence with the program and a more effective acquisition of the new routine. Researchers have previously suggested that PPRs, especially cognitive PPRs, may be ineffective with youth athletes (Lidor & Mayan, 2005; Nevett & French, 1997). In the present study the participant aligns with chronological age against Lidor and Mayan (2005) participants (mean age: 16.5) and we concur with Lidor and Mayan (2005), that experience (i.e., a high training age and/or exposure to psychological skills training) may moderate the effect of a young chronological age and thus add weight to the argument that youth athletes can indeed benefit from the use of use PPRs.

Unforeseen issues linked with injuries occurred during the PPR implementation phase, however, the PPR program also appeared to be effective in these circumstances too. It is known that gymnasts have a high incidence of injuries (Hoshi, Pastre, Vanderlei, Júnior, & Bastos, 2008; Nunomura, 2002) and persist in training even when suffering from pain and injuries. In this study, the gymnast had a moderate back pain but maintained his physical training in a more cautious manner. However, the gymnast was able to focus his PPR "home task" to execute during his spare time. This was welcomed and proved to have an important impact in the gymnast's PPR training as he stated:

I think it probably did help. Because I get to think about it more and it makes me more comfortable in the run, so when I come to the training I know what to do. (Post-intervention)

When interpreting the findings of the present study it is important to acknowledge that the case study based PPR design should be viewed with caution. Further research, though costly in time and resources, may indeed assess the viability of this strategy and refine its applicability. The aim to replicate with a larger number of young participants from different sports and skills will indicate the generalizability of such an approach. Further phases of retention/follow up would also indicated if there is a temporal effect to pre performance routine associated with proximity to initial psychological skills training for PPR's.

Linked to this, further work may also explore the development and refinement of skills linked with learning and performance of more advanced skills and the PPR's effectiveness as competition demands change.

In conclusion, the case study provide a detailed insight into a youth gymnast experience with the implementation of independent psychological skill training before combining into a 'routine'. The intervention was successful in creating an effective PPR as perceived by the gymnast and thus, contributing to a consistent preparation to perform and, consequently, the enhancement of performance in both practice and competition. In this sense, PPR development requires an individual approach with regard to design and support and perhaps warrants such investment in order to be successful. The implementation of the routine was a strength of the program as the gymnast consistently developed and then combined skills and so achieved a more automatic and comfortable program integration which had positive reflections in the retention phase. Indeed, this study has perhaps stimulated a need for further exploration of PPR with young athletes. In doing so, it is postulated that coaches, sport psychologists and organizations will become better informed to design, implement and manage appropriate PPR interventions for elite youth athletes.

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PROPOSAL OF PSYCHOLOGICAL PREPARATION IN ARTISTIC GYMNASTICS

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Review article

Abstract

The athletes' psychological preparation constitutes part of the whole athletic preparation. However, the implementation of psychological skills training programs to gymnasts is rather limited and has a vague outcome. The purpose of the present paper was to make a proposal with the aim to assist the development of psychological skills training programs in artistic gymnastics. This proposal maintains that such a program should have the following objectives: (1) reinforcement of inner motives, such as volition, (2) avoidance of negative feelings, such as fear, and (3) implementation of a series of other practices discussed in the paper.

Key words: *Artistic gymnastics, psychology, training.*

INTRODUCTION

Psychological preparation, or psychological skills training (PST) as it is also called, constitutes part of the whole process followed by an athlete during his/ her athletic preparation. This is realized along with physical and technical preparation, although several viewpoints maintain that the best time to implement such a program is off-season or preseason (Weinberg & Williams, 2001).

Psychological preparation, nowadays, constitutes an integral part of any sport program that aims to the applicable athletes' preparation for the achievement of high performance (Singer & Anshel, 2006a, b). Indeed, the importance of PST in the development of athletic performance is widely acknowledged, and the number of athletes implementing psychological training strategies is increasing (Birrer & Morgan, 2010). The significance of PST is attributed to the fact that all participants in sports fall victim to mental letdowns and mistakes (Weinberg & Gould, 2003).

As cited in Lidor, Blumenstein and Tenenbaum (2007, p. 140) "The objective of the psychological preparation is to provide the athlete with psychological techniques which can help him or her to overcome psychological barriers, such a high level of anxiety, lack of motivation, lack of attention-focusing, or difficulty in recovering from injury" (Bull, Albinson, & Shambrook, 1996; Clarkson, 1999; Hardy, Jones, Gould, 1996; Moran, 2004). In addition, Weinberg and Gould (2003) reported that "Psychological skills training" refers to the systematic and consistent practice of mental or psychological skills for the purpose of enhancing performance, increasing enjoyment, or achieving greater sport and physical activity self-satisfaction" (p. 242).

In literature, a whole series of PTS proposals is included, yet there is no definite

answer as to what a PST program should include or in what sequence these skills should be taught (Weinberg & Williams, 2001). According to Birrer and Morgan (2010), some authors maintain the simultaneous or alternate use of the phrases "psychological skills" and "psychological methods". On the contrary, Vealey (1988) underlined the necessity to distinguish between psychological skills and psychological methods. The same author maintained that skills are qualities to be obtained; methods are procedures or techniques employed to develop these skills.

In an effort to establish an applicable PST program, Vealey (1988) determined a set of skills as foundation skills (volition, self-awareness, self-esteem and self-confidence), the qualities of which are basic and necessary to psychological skills; while as foundation methods (physical practice and education) he determined those that can be used to develop and enhance psychological skills. Research supports the maintenance that the above mentioned skills are acquired and developed through educational intervention experiences via the PST program (Vealey, 1994; Weinberg & Comar, 1994) and natural learning experiences (Gould, Dieffenbach, & Moffet, 2002; Hanton & Jones, 1999; Weiss, 1991).

Gymnastics is an environment in which several PST strategies (e.g., Salmela, 1989) have already been tried; yet their number is limited. Two recent studies, on elite female gymnasts aged 12, used different 10-month PST programs. The first study made use of teaching relaxation, self-talk, goal setting, focusing and visualization (Fournier, Calmels, Durand-Bush, & Salmela, 2005) as intervention techniques; while the second study used: (a) foundation skills (goal-setting, self-confidence, commitment), (b) psychosomatic skills (stress reactions, relaxation, activation, and (c) cognitive skills (imagery, mental practice, focusing, refocusing, and competition planning) (Calmes, d'Arripe-Longueville, Fournier, & Soulard, 2003).

Gymnastics is an individual sport in which performance is the outcome of a, mainly, individual effort. This leads us to the hypothesis that performance, apart from the physical and technical preparation, can be also the outcome of psychological competences, on the basis of which one can make decisions based on conscious urges (inner motives), for example volitional competence. Weinberg and Williams (2001) supported that "without an individual's desire to achieve success, there is little hope that any psychological skills program would be successful because it takes commitment to practice the skills and carry out the program" (p. 363). Gymnastics is, also, a sport causing intense emotional arousal, for example the feeling of fear, in which case the avoidance of such feelings is sought. Furthermore, it is considered that high performance level is a matter of being acquainted with the conditions prevailing in the games. Thus, this necessitated the usage of a series of other practices, within the framework of a PST program.

In brief, it could be claimed that the implementation of PST programs to gymnasts is limited and in many cases it is accompanied by inadequate results. The purpose of the present paper is – on the basis of the already existing considerations on PST – to make a proposal for the development of relevant programs, with the aim to improve the gymnasts' psychological skills. This proposal maintains that in order to achieve maximum performance, a set of psychological functions plays a pivotal role; these functions are (1) the reinforcement of inner motives, such as volition, (2) the avoidance of negative feelings, such as fear, and (3) a whole range of other practices discussed below.

1. Reinforcement of inner motives – Volition

The term "motive" refers to specific conditions which activate individual behaviors and direct orientation towards an aim, while being of different origin – either intrinsic or extrinsic (Papadopoulos, 2005). Intrinsic motivation relates to emotions and the deeper or actual satisfaction of the

individual, concerning the goals he/ she sets (e.g., delivery of a painful – for him/ herself – physical activity) or fully accepts, while extrinsic motivation relates to extrinsic rewards from the others.

Above, volition competence was referred to as an inner motive determining the individual's behavior. The term *volition* generally means the "competence" which exists as a basis of a conscious action and, more specifically, one's ability to make a decision based on conscious urges concerning a specific behavior. Volition can be considered the "competence" of an individual to be committed to a goal – chose on his/ her own – and coordinate all his/ her forces in order to achieve such goal. For example, in sports each athlete is characterized by achievement goal-setting. The ability to achieve the goals set, regardless of any obstacles present, characterizes the extent of the athlete's volition.

Qualities of volition

Volition is described as a psychic phenomenon (Sechenov, 1952, as cited by Ryba, Stambulova, & Wrisberg, 2009), the function of which is expressed by a set of further functions called volitional qualities. These qualities are manifested comprising at the same time all three components of volition (cognitive, affective, and operational component). Puni (1977) mentions purposefulness, persistence and perseverance, decisiveness and courage, initiative and independence, and self-control and composure as qualities of volition.

In additions, it should also be noted that volitional qualities do not act separately from each other but in an interactive fashion (Ryba et al., 2009). Ryba and colleagues maintained that any particular structure of volitional qualities is determined by the stable and objective conditions of the specific activity and actions in questions; for example, in the sport by the relatively stable and objective conditions of the particular sport. More specifically as concerning gymnastics, the two researchers determined as central components composure and self-control.

The value of Volition

Psychologists have expressed several viewpoints on the function of volition in human behavior related with performance. A viewpoint, as already mentioned, is the one which considers volition a psychic phenomenon that directs goal-oriented behavior, particularly in adverse conditions. Ryba et al. (2009), based on the above mentioned view, determined volition as an active side of the mind and moral feelings and one of the functions of a normally working brain that enables an individual to self-control and regulate, especially when overcoming obstacles of varying degrees of difficulty (p. 278). Kelleman, Bussmann, Anders, and Schulte (2006) maintained the usage of volitional skills, for example in order to overcome fatigue, as well as keeping the pace when tired, aiming at the achievement of a high performance level. Bembenutty and Karabenick (1998) maintain that volitional skills direct individuals' dispositions to postpone immediate rewards in order to gain larger rewards temporally distant. There is empirical evidence indicating that the use of volitional strategies is related to decreased delay of gratification, increased effort, and better time and study management (Bembenutty, Karabenick, McKeachie, & Lin, 1998).

According to Ryba et al. (2009) the assessment of volition as a psychic phenomenon enables better understanding the structure of volitional manifestations of personality, with each manifestation comprising intellectual (cognitive), affective (motivational) and operational components (skills). Corno and Kanfer (1993) have emphasized that appropriately applied volitional control helps students to study by regulating cognitive, motivation, and affective processes around challenging goals.

Another prevailing point of view concerning volition is that it constitutes a part of a broader self-regulatory system that involves motivation as well as volition

(Corno & Kanfer, 1993). Self-regulation skills have been shown to be related to sport performance (Barkhoff, 2000; Beckmann, 2001; Beckmann & Kazen, 1994; Kane, Baltes, & Moss, 2001; Mahoney & Avener, 1977; Singer, 2002; Van Ralte & Brewer, 1996). Elbe, Szymanski and Beckmann (2005) report that "volition is a construct from motivation psychology that describes the processes and mechanisms of self-regulation and is commonly referred to as the 'will'" (p. 560). The role of volition in the mechanism of self-regulation is understood by examining the predecisional (cognitive activities involved in making decisions and setting goals) and prodecional (activities engaged in after goal setting) processing. More specifically, predecisional analyses involve decision making and are motivational; while postdecisional analyses deal with implementing goals and are volitional (Schunk & Zimmerman, 2003). This reveals that volition mediates the relation between goals and actions and helps learners accomplish their goals. For example, an individual's involvement in sport is a decision motivated by circumstantial factors (e.g., parents, coaches), while performance in sport is a matter in which the individual's volition plays a pivotal role.

Self-regulation is maintained to be a broader process which encompasses activities before, during and after (Zimmerman, 2000); while volition may be the aspect of self-regulations that occurs during performance (Schunk & Zimmerman, 2003). However, the significance of volition in improving the performance lies in the fact that it comprises a set of psychological control process that protect one's concentration and direct effort in the face of obstacles and distractions (Corno, 1993).

In brief, it could be maintained that the value of volition lies in the following:

- It fosters an optimistic attitude towards sports, as even hardships seem like necessary transitional periods.
- It accumulates all individual's strengths enabling thus exceptional performances in sport.
- It leads the individual to freedom, independence and self-awareness.
- It contributes to goal achievement.
- It attributes to the individual the athlete's psychology.

Development of Volitional Competences

The development of volitional competences, as an aspect of psychological preparation, is one of the fundamentals of training process and is realized along with the other aspects of training (physical, technical and tactical preparation). Psychologists support that optimum volitional functioning is an emergent property of synergies between individual and the situation (e.g., Bandura, 1986). This means that the training habits and styles that mark volition can be seen in strategies efforts by athletes to accomplish self-reliantly the various tasks that training presents. According to Kuhl and Fuhrmann (1998) the development of volition takes place throughout life, however with its most striking features being evident during childhood and adolescence (Elbe et al., 2005).

Puni (1971, 1977), in an effort to establish a conceptual model of volitional preparation in sport, considered that volition relates not only to the motor elements of athletic behavior but also to the cognitive and emotional elements as well. For this reason, he underlined the development of cognitive, emotional and operational elements of volition within a broad range of sport and life situations, beginning in the early stages of an athlete's career.

Gymnastics as a sport comprises a whole range of special features. For example, the individual character of this sport gives it some intense cognitive (e.g., learning), emotional (e.g., fear) and operational (e.g., decision-making) components. Thus, such features can be distinguished, depending on their significance, in primary volitional qualities,

such as persistence, purposefulness and expedience, and in secondary qualities such as courage, inventiveness, and initiative. Below, a way to develop volitional qualities in the training of gymnastics is proposed, based on the above mentioned considerations.

Primary volitional qualities:

Persistence: Persistence is the individual's steady and continuous effort to achieve a goal, even in case several difficulties, problems or obstacles are encountered. According to Bandura (1986) persistence is endurance, or the refusal to give up, especially when faced with opposition.

The value of this skill is that it strengthens volition, renders the individual addicted to hard-working and increased efforts, while it also contributes to overcoming all difficulties.

Implementation: In order to develop persistence, it is necessary to create the applicable conditions (difficulties) for its manifestation, such as:

- To increase the work volume during training.
- To execute the exercises when already tired.
- To execute the same exercises under competitive conditions (e.g., presence of spectators, individual performance, competition under assessment).

Purposefulness: Purposefulness is the quality of the individual who does not hesitate to make decisions and realize them. This skill concerns the ability to make a decision and the consequent behavior – that is the persistence to realize a decision made. For example, the athlete's performance of exercises despite any plausible difficulties entailed.

The value of this skill lies in the fact that it increases energy, fosters independence, strengthens volition, contributes to the development of courage and increases optimism.

Implementation: Here also applies the same principle, as that in the case of the skill of persistence. More specifically, during training conditions are created (difficulties) in order to manifest purposefulness.

Such conditions could be the following:

- Intervention of contingencies in the execution of exercises.
- Execution of exercises with the risk of falling down.
- Execution of new exercises under competitive conditions.
- Intervention of conflicting conditions in training, which require fast and accurate solutions.

Expediency: Expediency is the action serving some purpose, or is willful. For example, in gymnastics this skill is characterized by the clarity of the athlete's goals and tasks, the plan on the basis of which the athlete regulates his/ her activities and behaviors, as well as the focusing of the target on achieving a score.

The value of this skill lies in the fact that it creates goals while directing efforts and attention.

Implementation: To improve this skill, the following are suggested:

- The athletes, during training, should anticipate specific issues concerning exercises, programs, etc.
- The athletes who are to enter the competition should plan their own preparation in specific training.
- To have the programs of the athletes who are to enter the competition – or their co-athletes or even of the athletes of other teams – analyzed.

Secondary volitional qualities:

Courage: Courage is one's ability to anticipate situations with calmness and objectivity, this means without any fear, unrealistic thoughts or calculations, and at the same time with determination and intense hope for a positive outcome and success (Papadopoulos, 2005). Raatma (2000) maintains that courage is the strength to do the right thing even if it is hard.

The value of this skill lies in the fact that it contributes to the improvement of performance in gymnastics, as without it the several (difficult, dangerous) exercises

could not be successfully executed. More specifically, courage helps the individual overcome obstacles, provides the necessary courage and inner strength, stability and ongoing effort, as well as the necessary optimism, and meeting of objectives.

Inventiveness: Inventiveness is a mental ability by means of which the individual makes new and original thoughts and expressions or combinations of things; for example, in gymnastics, devising an execution in order to continue a program after an unexpected interruption.

The value of this skill lies in the fact that it fosters imagination and creativity, improves inspiration, while it also develops ingenuity and resourcefulness.

Initiative: Initiative is the decision making and performance of activities related to personal volition, this means without the intervention of any external influences or urges (e.g., from coaches, parents).

The value of this skill lies in the fact that it increases the individual's imagination, ingenuity and creativity, strengthens the individuality and volition, shows self-confidence, reveals confidence in human powers, leads the individual to overcome obstacles and difficulties, while it also sets new problematic. Furthermore, it is a necessary development factor, which combats uniformity and massiveness, contributing to action and effort to win competition.

Implementation of secondary volitional qualities: Briefly, for the development of the above mentioned secondary volitional qualities, the following are necessary:

- To organize training sessions in different settings (classrooms, apparatuses, different arrangement of apparatuses, etc.).
- To have programs and combinations of programs executed towards both directions with a different arrangement of the apparatuses.
- To use competition during training, depending on the requirements of the competition to come, aiming to better execution of exercises, etc.
- To include model training in the whole training course.
- To participate in demonstrations.

2. Avoiding negative emotions

Gymnastics is an environment that causes intense mental stimulation of both positive (e.g., enjoyment) and negative emotions (e.g., stress and anxiety). Researchers in sport and exercise have recognized that emotional experiences influence social relations, performance, etc (e.g., Solomon, 2003; Treasure, 2001; Vast, Young, & Thomas, 2010). Within the framework of negative emotions, athletes are called to anticipate mental (e.g., worry, fear) and physical difficulties (e.g., injury). Chase, Magyar, and Drake (2005) maintained that the sport of gymnastics is known to place mental and physical demands on the athlete.

Among the negative emotions that constitute a serious obstacle to the gymnasts' training are the reactions due to fear. *Fear* is the emotion deriving from a real or imaginary danger. Gullone and King (1997) describe fear as a state of being apprehensive or scared when one is presented with real or potential threat. Research has revealed that the fear of physical injury seems constitutes a common source of worry, even a possible reason for leaving the sport, among highly competitive gymnasts (Duda, 1995; Duda & Gano-Overway, 1996; Klint & Weiss, 1986; Weiss, Wiese, & Klint, 1989).

Causes for the activation of the emotion of fear can be considered the *body* (fall, injury), the *environment* (other others' reactions), the *memory* (acknowledgement and recall of past events) and the *imagination* (thinking in terms of pictures of past events). Caine, Caine and Linder (1996), and Kerr and Minden (1988) underlined the significance of difficulty to perform skills of high intensity and high volume of training in the establishment of a risk for the gymnasts, as well as an eventual injury. According to Bandura (1997) fear of injury may be present when a gymnast has

lost confidence in her ability to perform successfully in threatening or taxing circumstances.

Fear of injury can produce detrimental influences on a gymnast's performance and self-confidence in gymnastics (Magyar & Chase, 1996). In addition, perceptions of fear have the potential to disrupt attention and ultimately hinder the athlete's future performances (Bandura, 1990, 1997; Feltz, 1982; Heil, 1993, 2000).

Avoiding fear

To avoid the reactions of fear and – what's more – its negative effect, two forms of fear avoidance strategies are proposed. The first one comprises implementation in the context of learning new exercises, while the second one entails the use of psychological skills.

More specifically, in the first form of strategy the following are proposed:

- To execute specific preparatory exercises for the faster and economical learning of motor habits.
- To pay attention to the risk, which is latent in the new exercises, so as to significantly reduce fear.
- To start individual execution as early as possible.
- To keep assistance in learning a new exercise to a minimum.
- To estimate the execution time of a program or a combination of exercises.

The development of the athlete's ability to *estimate time*, this means to estimate and differentiate the execution time of a combination or a program of exercises constitutes one of the most significant components of training. To achieve this, the following are necessary:

- This specific combination or program to be represented.
- A verbal report on the duration of part or the entire program – specifically concerning the apparatuses of floor in both males and females and the balance beam for females – to be provided.
- Continuous feedback from the coach, during the execution of a program or its parts, to be provided.
- The decrease or increase of the duration of a program to be attributed to specific issues.

While, in the second form of strategy the following are proposed:

- To pay substantial attention to the control of functions such as the gymnasts' *concentration* before a competition or combination or an exercise. Concentration is the ability to maintain focus on relevant environmental cues (Weinberg & Gould, 2003). Moran (2004) supports that concentration refers to a person's ability to exert deliberate mental effort on what is most important in any given situation. The effective concentration enables athletes to apply appropriate attention to internal and external cues in the sporting arena. A recent research conclusion demonstrates that participants benefited from exposure to concentration-enhancing skills training (Sheard & Golby, 2006).

Implementation

In order to enable focusing on a specific situation (e.g., the execution of a program) the following are considered necessary:

- To regulate the issue of attention for each performer individually. For example:
  - The points to which they should pay attention during the execution.
  - Whether they have to pay attention during one or more points of the execution.
- Each performer to be introduced with specific issues beforehand, while focusing (in the training or the competition).
- Each performer to repeat the execution of a program before the competition or the training session. "Dress rehearsal". Dress rehearsal is a rather effective strategy to keep concentration for sports such as gymnastics (Schmid, Peper, & Wilson, 2001). Dress rehearsal is based on the concept that ease in skillful competitive performance is unconsciously conditioned by external and internal stimuli that around athletes during practice.
- Stopping action: this way a negative thought can change into a positive one

(Zinsser, Bunker, & Williams, 2001). According to Sheard and Golby (2006) removing negative thoughts often makes it possible to break the link that leads to negative feelings and behaviors.

- Furthermore, other psychological skills proposed for the gymnasts to overcome their fear are relaxation, imagery and positive self-talk (Magyar & Chase, 1996), and visualization (Mahoney & Avener, 1977; White & Hardy, 1998).

3. Other practices

Apart from the development of volitional competence and learning to avoid negative emotions, during the gymnasts' psychological preparation significant should be also a set of practices, such as adaptive (model) as well as approved trainings.

Adaptive trainings

The use of adaptive workouts in gymnastics can start rather early before the official competition and continue even after the completion of the latter. Adaptive trainings approach the conditions of the competition to come. Through these trainings, the maximum adaptation of the gymnast's potential is achieved. The more comprehensively and applicably organized these sessions the calmer are the gymnasts on entering the competition.

Structure of adaptive trainings:

Warm up. Warm up should correspond to the time and content of the warm-up before the competition. It starts 1-1.30 hour before the competition and is called "general". After the execution of general exercises (e.g., running, stretching and dynamic exercises), task-specific warm up follows, as well as a "walk" to the apparatuses. During the specific warm-up the number of contacts with the apparatus, as well as the number of exercises depend of the gymnasts' level, their general preparation and the general difficulty of the programs they execute. Some are used to execute whole programs of exercises – it is an individual choice.

Competitive part. The competitive part starts with the gymnasts' entrance parade onto the floor, accompanied by music, for the warm up. Each group of gymnasts stops in front of an apparatus and on a sound signal the actual warm up starts. Each gymnast has about 30 seconds to execute either a couple of contacts, or the whole program.

The gymnasts' assessment is performed as in the case of the official competition, by judges. The effect of training is positive, despite the fact that each session starts with a different apparatus. Furthermore, in adaptive trainings some additional conditions – such as adequate lighting of the room, the suit, the decor of the room, the presence of the spectators, the noise, etc. – should also be taken into account. Finally, a fundamental condition to be included in the adaptive workouts is the independent execution of programs without the coaches' instructions or assistance.

Approved trainings

Approved trainings are those performed in the room and on the "podium" of the official competition.

Organization of approved trainings:

Their organization is based on the schedule (plan) predetermined (technical meeting). The issues concerning the approved trainings are the following: being acquainted with the conditions of the competition, testing of apparatuses and modeling the competition.

The gymnasts enter the gym 1-1.30 hours before the competition for the general and task-specific warm-up. On entering the podium, warm-up starts. They have 30 minutes to complete this phase. During this period, they execute several exercises and combinations of exercises.

Approved trainings are significant because: they simulate the actual competition conditions, the arrangement of the apparatuses is apprehended and the competitors' status is comprehended. In these workouts, the athletes should be aware of the following: the sequence of execution in each apparatus and the content of the

training itself (number of contacts, execution of individual exercises or combinations of exercises). Moreover, another set of organizational issues should also be settled, namely: who and in what way will help the coaches; who will adjust the apparatuses; who will place the board; who will announce the vault number; who will carry the performers' clothes.

Tactics of approved trainings

The tactics of the approved trainings entails the following:

- The performers should give the impression that they are sure as concerns the execution.
- To execute separately the difficult or original exercises – even if they are not included in the competition.
- Some of the above mentioned exercises could be executed in the competition as well.
- To show maximum correlation of difficulty, style and confidence.
- To execute the exercises with calm and confidence.
- To eliminate any failed attempts and repeated executions due to failure.

➢ This requires the pre-determination of the training content.

➢ The impression of confidence concerning the execution of an exercise should be created to the judges, as it constitutes a fundamental issue in the final assessment.

➢ During the approved workout, the fully acquainted exercises should be executed with confidence.

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PARENT'S EXPECTATIONS TOWARDS CHILDREN'S ARTISTIC GYMNASTICS EXERCISE

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Original research article

Abstract

The aim of this study is to determine the reasons for referral of the child in gymnastics such as expectations of success in sport and parent's relation towards exercise. On the sample of 55 fathers and 60 mothers of children athletes, a questionnaire was applied to find out parent's attitudes and expectations for children achievements in artistic gymnastics. Descriptive statistics, correlation and chi-square test were used to get out results. Results of Chi-squared test showed that there is no statistically significant difference between mothers and fathers in reasons to involve their child in gymnastics nor expectations of child's achievements.

***Key words**: children, attitudes, physical activities of parents, gymnastics.*

INTRODUCTION

Parental support is crucial in decision-making about starting children's sports activities (Howard & Madrigal 1990). Artistic gymnastics is a specific sport regarding child's age at the moment of involving in this activity. It's one of the few sports where child can join at the age of three, which is rare in other sports. Artistic gymnastics is quality basis for engaging in any other sport. Large number of top athletes were engaged in artistic gymnastics in the early age, and today we have some top athletes (like Ivica Kostelić, or once before his sister Janica (multiple Olympic, World and World Cup Champions in alpine skiing)) using gymnastic facilities as a means for additional preparation in their sports (Živčić Marković, Stibilj-Batinić, Gorišek & Šinkovec 2011).

Gymnastics is a combination of motor skills and abilities such as: coordination, grace, agility, strength and flexibility. It is divided into male and female artistic gymnastics. There are six events in men's artistic gymnastics: floor, pommel horse, rings, vault, parallel bars and high bars and four events in woman's artistic gymnastics: vault, uneven bars, balance beam and floor. Although the exercise itself, depending on the apparatus, can be relatively short, it is generally physically very demanding and require exerciser's strength, agility, endurance and coordination in space (Živčić 2007).

Attitude is mental readiness, acquired through individual experience, making the directive or dynamic influence on the response of individuals to objects and situations with which it comes to contact (Allport, 1935). Attitudes are primarily social learning outcomes (Baron and Byrne, 1994). Many of our attitudes are the result

of a situation in which we observe the behavior of others. Some studies have also shown that attitudes derived from the experience are less resistant to change (Baron and Byrne, 1994). Attitudes can be relatively easily measured, and by measuring them we can better understand human actions and explain and predict human behavior (Biletić, Benassi, Baić, Cvetković & Lukšić 2008).

Socialization comes down to individual's adjustment to community, which is a prerequisite for its integration and socialization. It is divided into primary and secondary socialization. Primary socialization is realized in the first years of life and usually occurs within the family. Secondary socialization takes place in later years, and it is the most affected by school and peer groups (Leburić, Ljubetić & Radić, 2009).

Research of Lacković-Grgin (1982) shows that the relationship between parent and child is fundamental to the successful socialization of the child and healthy personality development. The family is an important factor in child's development.

Parental beliefs associated with sport are predominantly positive and mostly related to the positive impact of sport on health and abilities of their children, then the desired socialization of children in sport and experience of the sport as safe activity in which children avoid violence, alcohol and drugs (Townsend and Murphy, 2001).

According to research by Fišer (2007) conducted in Slovenia half of athletes were directed in the sport by professionals who have recognized their talent in the kindergarten or school and the other half by parents who directed them in a particular sport. Same was proved by Hahn (1982) in his research. Parents who direct their child into sport are athletes themselves or the child's brother or sister is already engaged in sport.

Parents are supposed to support their child in every way. The quality of children's involvement in sports is largely dependent on parental support for this activity (Brustard, 1993). Parents are expected to positively encourage the activity of their children in sports. Support and realistic expectations play a crucial role in the child's continuous engagement in sport (Woolgar & Power, 1993), even if it's only on the level of recreational exercise. If parents themselves are not models for the "sporting life", they are supposed to show good benefits of sports (Bosnar, 2003). Parent's help in the whole system of child's athletic career is inevitable, especially for mental stability and health. Experience of success and personal efficiency are fundamental factors in the development of self-image and preventing unwanted behaviors (Wigfield and Eccles, 1992).

Nowadays, children start to play some sport very early. Artistic gymnastics is the sport in which you can start to train at the age of three. This is the age where parents make decisions about child's choice and staying in sport so is good to know the reasons for children's referral in gymnastics such as parent's relations regarding the child's success.

The aim of this study is to determine the reasons for referral of the child in gymnastics such as expectations of success in sport and parent's relations towards exercise. We were interested whether the aspects of mothers and fathers also differ.

METHODS

The research was conducted on the sample of 115 parents (55 fathers and 60 mothers) during March 2010. The parent's age were between 26 and 51 years old and the average age was 39.5±9.8 s.d. The children were between 3 and 14 years old the average age was 7.1±2.8 s.d. Differences in parent's expectations regarding the age of child were not statistically significant. Children trained artistic gymnastics in gymnastic club "Novi Zagreb" on the recreational level 2 hours per week.

The parents' participation in the research was voluntary and anonymous. Questionnaires were distributed to parents during the training. Out of total of 115 parents (one parent from each child) in the

research, 26 were fathers with sons and 29 were fathers with daughters (a total of 55 fathers). There were also 35 mothers with sons and 25 mothers with daughters (a total of 60 mothers).

Table 1. *Description of the samples for parents, sons and daughters.*

		Child		Total
		Son	Daughter	
Parent	Father	26	29	55
	Mother	35	25	60
Total		61	54	155

The questionnaire, specially designed for this occasion, contained 13 particles which the parents could rate on the scale of 1-5.

Variable description:

1. Gymnastics help develop motor skills and are beneficial for the children's health (MSHB)

2. The child can meet new people and make friends in gymnastics training (NPMF)

3. Regular training develops work habits and helps learn proper time management (WHPTM)

4. Secures a drug and alcohol free environment to spend their free time in (DAFT)

5. Children can meet athletes who can be their role models (ARM)

6. Stops them from spending their time in front of the TV or computer (TTV)

7. Helps maintain optimal body weight (OBW)

8. They can develop confidence and self respect trough gymnastics training (DCSR)

9. They can learn enough about gymnastics to help them recreationally pursue any other sport (GPOS)

10. They can learn enough about gymnastics to help them competitively pursue any other sport (GCOS)

11. Master gymnastics to the degree that they can participate in amateur club competitions (GACC)

12. Master gymnastics to the degree that they can participate in international club competitions (GICC)

13. Master gymnastics to the degree that they have the opportunity to be called up in the national (GCUN)

Alongside the above mentioned particles the parents' achievements in sports were recorded on a six degree scale. The age of the parents (26-51) and the children (3-14) was registered.

The data analysis was conducted using the statistics program Statistics for Windows 8.0. Arithmetic means, standard deviations for each variable and the percentage of parents involved in sports are presented using descriptive statistics. The link between the particles, child age and the parents' achievements was obtained using correlation analysis. Chi-squared test was used for determining differences in expectations of achievements regarding parent's gender. Cronbach's alpha was used for proving reliability of questionnaire (Cronbach alfa=0.80) and factor analysis of principal components was used to validate questionnaire (67.39% variance was extracted and 1st factor explained 30.84 % of variance). According to criteria for social sciences questionnaire is reliably and valid.

RESULTS AND DISCUSSION

The first statement: it is very important to the parents that their child develop motor skills and remain healthy, has the highest mean value (4.88). The standard deviation is minor and shows that there are no significant divergences. The second statement (meeting new people) has a bit smaller value, but it is also important to parents. However, the standard deviation shows greater dispersion of results for these claims. From the data for the first two claims, we can conclude that it's more important to parents that the child develops physically, then to develop socially. Statements 3 (developing work habits), 4

(alcohol and drug free environment) and 8 (developing self-respect trough training) have the same means (4.52) and we can conclude that it is very important for parents that their children acquire good work habits through gymnastics training, spend less time in places with drugs and also to develop self-esteem. The high value of claim 9 (4.62; gymnastics training helps to learn about other sports on recreational level) shows that parents highly valued universality of gymnastics, as the base sport for further engaging in any other sport. On the other hand, statements 12 and 13 that are related to the child's participation in the national selections and international tournaments show that parents consider child's development of motor skills more important than performance in the team.

Table 2. *Arithmetic means and standard deviations.*

	Mean	Std. Dv.
1.Gymnastics help develop motor skills and are beneficial for the children's health (MSHB)	4.88	.325
2. The child can meet new people and make friends in gymnastics training (NPMF)	4.01	.699
3. Regular training develops work habits and helps learn proper time management (WHPTM).	4.52	.547
4. Secures a drug and alcohol free environment to spend their free time in (DAFT)	4.52	.517
5. Children can meet athletes who can be their role models (ARM)	3.71	.904
6. Stops them from spending their time in front of the TV or computer (TTV)	4.34	.524
7. Helps maintain optimal body weight (OBW)	4.24	.638
8. They can develop confidence and self respect trough gymnastics training (DCSR)	4.52	.532
9. They can learn enough about gymnastics to help them recreationally pursue any other sport (GPOS)	4.62	.618
10. They can learn enough about gymnastics to help them competitively pursue any other sport (GCOS)	4.09	.963
11. Master gymnastics to the degree that they can participate in amateur club competitions (GACC)	3.43	.999
12. Master gymnastics to the degree that they can participate in international club competitions (GICC)	2.63	1.281
13. Master gymnastics to the degree that they have the opportunity to be called up in the national (GCUN)	2.55	1.294

Table 3. *Parent's sport achievement.*

ACHIEVEMENT	FREQUENCY	PERCENTAGE
1	12	10.5
2	29	25.2
3	12	10.5
4	32	27.8
5	25	21.7
6	5	4.3
Total:	115	100.0

Table 4. *Pearson correlations of particles MSHB-DCUN, child's age (CA) and parent's achievement (PA).*

	MSHB	NPMF	WHPTM	DAFT	ARM	TTV	OBW	DCSR	GPOS	GCOS	GACC	GICC	GCUN	CA
NPMF	.039	--												
WHPTM	.078	**.324**	--											
DAFT	.184	**.298**	**.507**	--										
ARM	.071	**.282**	**.389**	**.366**	--									
TTV	-.041	.255	**.330**	**.339**	**.517**	--								
OBW	.022	**.355**	**.333**	.249	**.441**	**.449**	--							
DCSR	-.007	.182	.246	.042	**.355**	**.386**	**.337**	--						
GPOS	-.148	.137	.018	-.072	.070	.084	**.374**	.198	--					
GCOS	-.094	.094	.187	.020	**.259**	.099	.382	.253	**.567**	--				
GACC	-.088	.018	.163	-.051	**.264**	.161	.265	.146	**.279**	**.526**	--			
GICC	.048	-.024	**.271**	.134	**.411**	**.318**	.244	.259	.106	**.344**	**.679**	--		
GCUN	.042	-.058	.242	.130	**.392**	**.312**	**.277**	.242	.123	**.366**	**.659**	**.966**	--	
CA	.010	.095	-.071	-.151	-.019	.024	-.126	.023	-.239	-.248	.022	-.073	-.111	--
PA	.021	-.075	.105	.140	.222	.138	.118	.052	.142	.175	.118	.135	.116	-.259

Bolded are significant correlations $p<0.05$

Table 5. *Differences between expectations of mothers and fathers for child's achievement.*

Statements	% answers of fathers	% answers of mothers	Chi-square test	Degrees of freedom (Df)	Sig. chi-square test
MSHB value					
4	10,9 %	13,3%	0,158	1	0,691
5	89,1 %	86,7%			
NPMF value					
2	1,8%	1,7%			
3	20,0%	20,0%	1,787	3	0,618
4	60,0%	50,0%			
5	18,2%	28,3%			
WHPTM value					
3	1,8%	3,3%			
4	41,8%	43,3%	0,316	2	0,854
5	56,4%	53,3%			
DAFT value					
3	1,8%	0,0%			
4	45,5%	45,0%	1,120	2	0,571
5	52,7%	55,0%			
ARM value					
2	3,6%	3,3%			
3	49,1%	41,7%	0,723	3	0,868
4	25,5%	28,3%			
5	21,8%	26,7%			
TTV value					
3	0,0%	3,3%	3,206	2	0,201
4	69,1%	56,7%			
5	30,9%	40,0%			
OBW value					
3	9,1%	11,7%	5,862	2	0,053
4	65,5%	43,3%			
5	25,5%	45,0%			
DCSR value					
3	1,8%	0,0%	1,608	2	0,448
4	49,1%	43,3%			
5	49,1%	56,7%			
GPOS value					
3	9,1%	5,0%	0,905	2	0,636
4	25,5%	23,3%			
5	65,5%	71,7%			
GCOS value					
1	3,6%	0,0%			
2	3,6%	6,7%	4,982	4	0,289
3	16,4%	13,3%			
4	41,8%	31,7%			
5	34,5%	48,3%			
GACC value					
1	1,8%	1,7%			
2	14,5%	11,7%	3,475	4	0,482
3	36,4%	43,3%			
4	32,7%	20,0%			
5	14,5%	23,3%			
GICC value					
1	18,2%	23,3%			
2	30,9%	25,0%	3,848	4	0,427
3	32,7%	25,0%			
4	9,1%	6,7%			
5	9,1%	20,0%			
GCUN value					
1	21,8%	26,7%			
2	30,9%	25,0%	3,869	4	0,424
3	32,7%	23,3%			
4	5,5%	5,0%			
5	9,1%	20,0%			

Table 3 shows that 10,5% of the parents have never engaged in any sports and 25.2% of them are involved in recreational level. The 64,3% of parents have exercised actively and had great achievements on national and international competitions. Results show that parents understand the importance of sports. On the other hand, Petračić and Badrić (2005) proved in their research that parents of 13.7% examined pupils are involved in sports and the other 86.3% are not. The research was conducted among 284 participants age 12 to 15. By comparing these studies we can conclude that the athletes' parents better understand the importance of gymnastics as a basic sport.

The greatest correlation is between variables 12 and 13 (.966) which are almost collinear (Table 4). It shows that parents consider participation in international tournaments a reason for call up into the national selection. The correlation between variables 11 and 12 (679.) shows that parents who expect from their child to participate at national competitions, also expect to compete at international level. Correlation between variables 3 and 4 (.507) is related to parent's wish for their children to gain work habits and learn to organize their time and spend it in a safety place without drugs and alcohol. Croatia participated in the last European research about consuming cigarettes, alcohol and drugs among students (ESPAD), in 2007. The results showed that: 84% of young people in Croatia have consumed alcohol at least once in the last 12 months (European average is 84%); especially significant is the raise of alcohol abuse among girls; most common places for alcohol abuse are parks, school grounds, kid's playgrounds and places near night clubs (Sučić Vojnović, 2009). Interesting, but not surprising, is correlation between variables 6 and 7 (.449) which is related to parents wish for their child to spend less time in front of TV and maintain optimal body weight. Although statistics show that children are moving less (according to the WHO data: from 1990 to 1999 number of the obese, inactive children in the world increased by 5.7% and from 2000 to 2009 was increased by 6.8%) parents from this sample are aware of risks that inactive lifestyle brings. Last correlation is child's age and parent's achievement in sports. We can see negative correlation (-.259) which is a sign of inverse proportionality. That means that parents with greater sports accomplishments enroll their children in gymnastics earlier. Variables related to maintaining optimal body weight and getting to know role models in life have the most important relationships with other variables.

Non significant differences were found in parent's relation to the exercise according to the gender (Table 6). We can conclude there is no difference in the expectations of fathers and mothers of children gymnasts.

CONCLUSIONS

The main purpose of this research was to determine a cause for referring a child into gymnastics and determine parent's relations towards children's artistic gymnastics exercise.

The results have shown that parents find most important for a child to develop motor skills and preserve health through gymnastics. Pearson's Chi-square test proved to be no differences in expectations regarding child's achievements in gymnastics between parent's genders and no differences regard the age of child. Artistic gymnastics is considered a basic sport for further engage in some other sport. Research showed that 80% of parents were involved in sports. Parents who are former athletes engage their children to gymnastics very early to develop into motor and psychological sense, and may later be directed to another sport. Individual competitive sports, such as artistic gymnastics, teach children good working habits, controlling errors, coping with stressful situations, planning and implementing strategies, taking responsibility and taking actions under pressure (Black, 2010). We could conclude

that mothers and fathers are homogenous group in terms of child and gymnastics.

A minority of parents (mothers) expect that their child should achieve great sport success, while the majority of parents expect positive development of motor, cognitive, affective and social skills. The generalization of results may be questionable due to the small number of participants (126).

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SPLIT LEAP WITH AND WITHOUT BALL PERFORMANCE FACTORS IN RHYTHMIC GYMNASTICS

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Original research article

Abstract

In rhythmic gymnastics execution quality depends directly on the level of technical expertise, as well as physical performance of the gymnast. the objective was to study the variation of execution factors, particularly the strength, speed and flexibility when performing gymnastics' jumps split leap with and without throw-catch the ball. Five female gymnasts aged 12 to 15 years members of Tunisian national team of rhythmic gymnastics participated in this study. Every gymnast realized the split leap four times without apparatus and with apparatus. 2D motion analysis has been established to study the split leap with and without throw-catch the ball. The results show a significant variation of execution factors when introducing the apparatus such as the initial velocity, vertical displacement, the fly time, the component of vertical and horizontal force and the angular velocity of the split. When performing the split leap with apparatus, execution parameters show a significant decrease with the exception of the vertical velocity, acceleration and angular velocity of the split, which increase to compensate for the fall signs of strength and vertical displacement. Finally, the results showed also that probably gymnasts did not perform a jump with apparatus the best way that could.
gymnastics.

Keywords: *dual-task, split leap, throw-catch, force, speed, flexibility*

INTRODUCTION

Rhythmic gymnastics is an artistic sport, performed with technical apparatus (rope, hoop, ball, clubs and ribbon). Leaps are fundamental gymnast movements that require complex motor coordination of both upper and lower body segment (Ashby & Heegaard, 2002). To make it all more interesting and complex, leap performance is in most of the cases followed by a additional but required manipulation (ball, rope, hoop and ribbon) and that manipulation is referred to requisite throws or passing through it. That is why the capacity of performing in rhythmic gymnastics is very complex, since the gymnast is frequently facing dual-task situations: jumping, twisting or balance with starting or handling apparatus. Therefore, we cannot consider only the quantitative aspect, but also the quality of execution that depends directly on the level of coordination, technical mastery, and physical performance of the gymnast. Within this framework, we can confer to

body strength, speed and flexibility, an important topic. However, these three parameters are not required in the same way depending on the readiness of the gymnast and the mode of execution of the exercise "simple or dual-task". Note that if the technical gesture is not automated during learning, early introduction of a second task may cause disruption in the execution of the first. In addition, neglecting the development of these physical abilities, affects negatively the optimal execution of the gesture when a second task is introduced. To combine many elements, a gymnast must have highly developed proprioception and motor control, obtained through neurological development, through years of practice. The neuromuscular system must coordinate movements, and very fine control is required, Brooks (2011).

In the literature, there are little researches till today that they have been addressed to the relationship between the deployment of the qualities of force, velocity and flexibility and the performance of gymnastics' jump with different levels of difficulty. Indeed, most research conducted in the field of gymnastics' jump, treat the biomechanical aspect (Manoni, 1986; Gross, Cova, Peura, & Samczyk, 1996; Rutkowska-Kucharska & Sikora, 1996; Sousa et Lebre, 1996 and 1998 ; Rodrigues, Rayes and Galàn, 2008; Cicchella, 2009; Purenović, Bubanj, Popović, Stanković and Bubanj, 2010; Sousa & Lebre, 2010; Abd El-Hammid, 2010). Physiological aspects and the effect of training, were treated by (Dyhre-Poulsen, 1987; Alexander, 1989; Pineau & Arbi, 1996; Hutchinson, Tremain, Christiansen and Beitzel, 1998; Di Cagno et al. 2008, 2009 and 2010). Researches related to motor control have been done by (Bodo Schmid, 1990; White & Hardy, 1995; Loquet, 1997; Micheles & Ruat, 1997; Kioumourtzoglou, Derri, Mertzanidou and Tzetzis, 1997; Miletić, Sekulié, and Wolf-Cvitak, 2004).

The aim of his research is to study the effect of a second task "throw-catch the ball" on the realization of a basic gymnastics' jump "split leap", to identify the different in the deployment factors of performance, particularly the strength, speed and flexibility, while throwing up the apparatus (Figure 1).

In this regard, we make the following assumptions: The success of the action would depend largely on the qualities of force-velocity and flexibility highly developed in specific aspect. On the other hand, the solicitation of these three factors of performance when carrying out the split leap would change significantly with the apparatus.

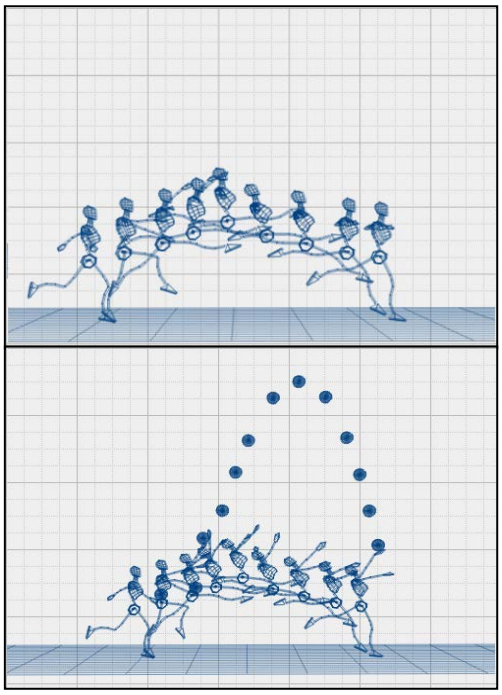

Figure 1. *Split leap with and without throw-catch of the ball.*

METHODS

Five female rhythmic gymnasts members of the Tunisian Junior National team (age 13.8 ± 1.3 years; height 1.58 ± 0.07 m; weight 46.59 ± 8.23 kg; training average 20 h / week) agreed to participate in this study. The experiment is performed in real conditions, on a floor of 12m x 12m. It is a two-dimension "2D"study based on a reference (O_x, O_y). The shooting was carried out by two cameras Sony DCR PC 105E, 1 megapixel CCD, 50 fps, 1 Lux minimum sensitivity, with wide conversion lens. The

first one is placed in front at 3m on the diagonal of the floor, and the second in profile at 15m from the axis of progression of the gymnast (Figure 2).

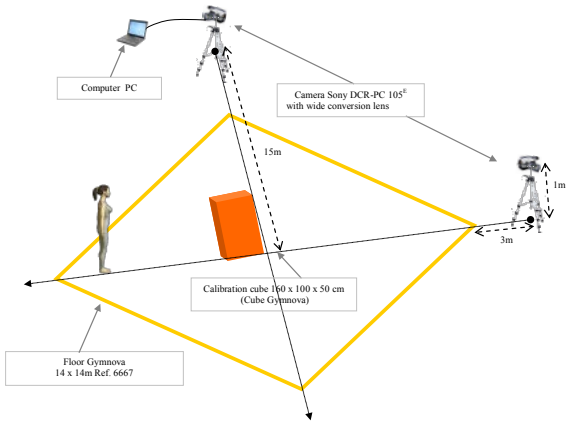

Figure 2. *Experimental device.*

During the first part of the experiment, each gymnast executes the split leap six times without apparatus separated by a two-minute recovery time. The second part consists of reproducing the same with apparatus. Only the best four trials were retained for the reproducibility analysis, and the best jump among the retained four is used for the comparative study.

We opted for the mono-segmental method of analysis (Thirunarayan, Kerrigan, Rabuffetti, Croce & Saini, 1996). Gymnasts were equipped with three markers: one on the hips (at 56% of the height) and two on the ankles to assess legs' split angular velocity. The geometrical center of the ball was also considered. Similarly, we adopted the ground and the center of gravity of the gymnast as a reference for study. To calculate the force generated during the pulse, we used the equations presented by Smith, (1983):

$$F_x = m \cdot \left(\frac{V_{xf} - V_{xi}}{t_i} \right)$$

and

$$F_y = m \cdot g \cdot \left(\frac{V_{yf} - V_{yi}}{t_c} \right)$$

** Fx: horizontal force component, F_y: vertical force component, V_{xi}: initial horizontal velocity, V_{xf}: final horizontal velocity, V_{yi}: initial vertical velocity, V_{yf}: final vertical velocity, t_i: initial time, t_c: contact time, m: mass, g: gravity.*

The analysis of the movements is performed by AviStep® and Regressi® software. The construction of the kinograms realized through Poser® 4 software. For data analysis, SPSS® 13.0 Software was used. The normality of distribution estimated by the Kolmogorov-Smirnov test wasn't satisfactory for all variables. Therefore we used nonparametric tests: The Friedman Test is used to assess the reproducibility of gymnastics' jumps while the U test of Wilcoxon was applied to compare the two technical jumps. The results are considered significantly different when the probability is less than or equal to 0.05 ($P \leq 0.05$).

RESULTS

The reproducibility' study did not show any significant variation of the performance factors. All gymnasts were able to repeat the same movement with and without apparatus. However, performance factors when split leap is executed without apparatus (SLw) were significantly different from those when the split leap is executed with throw-catch of the ball (SLtc), (table 1).

Only the vertical velocity (Vy) and the angular velocity of the split (ωsl) increased significantly at ($p < 0.05$) during the (SLtc), [1.6 ± 0.1 m/s vs 1.5 ± 0.2 m/s for the (Vy) and 963.4 ± 11.2 deg/s vs 803.3 ± 20.3 deg/s for the angular velocity of the split respectively for the (SLtc) and (SLw)].

On the other side, all the other components decreased significantly: Peak power was significantly lower ($p < 0.05$) [1480.4 ± 217.9 W vs 1606.7 ± 291.6 W respectively for (SLtc) and (SLw)]. Force was also significantly lower [924.8 ± 82.2 N vs 1032.3 ± 125.6 N respectively for (SLtc) and (SLw)]. Indeed, we noticed a drop in the level of vertical force component of

107.52 N in (SLtc). In its turn, initial velocity significantly decreased [6.937 ± 0.973 m/s vs 7.971 ± 0.302 m respectively for (SLtc) and (SLw)]. Vertical displacement was also significantly lower [0.382 ± 0.02 m vs 0.4 ± 0.03 m respectively for (SLtc) and (SLw)].

Table 1. *Comparative study between the split leap and the split leap throw-catch.*

		Means	*Standard deviation*	*Z*	*Df*	*Sig,*
Horizontal Displacement d_x (m)	SL_w	2,059	0,109	-1,214	4	0,225
	SL_{tc}	1,856	0,321			
Vertical Displacement d_y (m)	SL_w	0,413	0,036	-2,023	4	0,045*
	SL_{tc}	0,382	0,027			
Initial Velocity v_i (m/s)	SL_w	7,971	0,302	-2,023	4	0,045*
	SL_{tc}	6,937	0,973			
Horizontal Velocity v_x (m/s)	SL_w	4,118	0,32	-0,674	4	0,5
	SL_{tc}	3,925	0,775			
vertical Velocity v_y (m/s)	SL_w	1,504	0,115	-2,023	4	0,045*
	SL_{tc}	1,600	0,154			
Horizontal Force Components f_x (N)	SL_w	47,173	11,204	-2,023	4	0,043*
	SL_{tc}	40,711	9,314			
Vertical Force Components f_y (N)	SL_w	1032,323	125,269	-2,023	4	0,043*
	SL_{tc}	924,802	82,175			
Peak Power p_y (W)	SL_w	1606,732	219,659	-2,023	4	0,045*
	SL_{tc}	1480,455	217,968			
Angle of Split α_{sl} (deg)	SL_w	185,22	3,766	-1,753	4	0,08
	SL_{tc}	180,630	4,165			
Angular Velocity of the Split ω_{sl} (deg/s)	SL_w	803,285	20,279	-2,023	4	0,043*
	SL_{tc}	963,408	11,492			

* Significant at $P < .05$

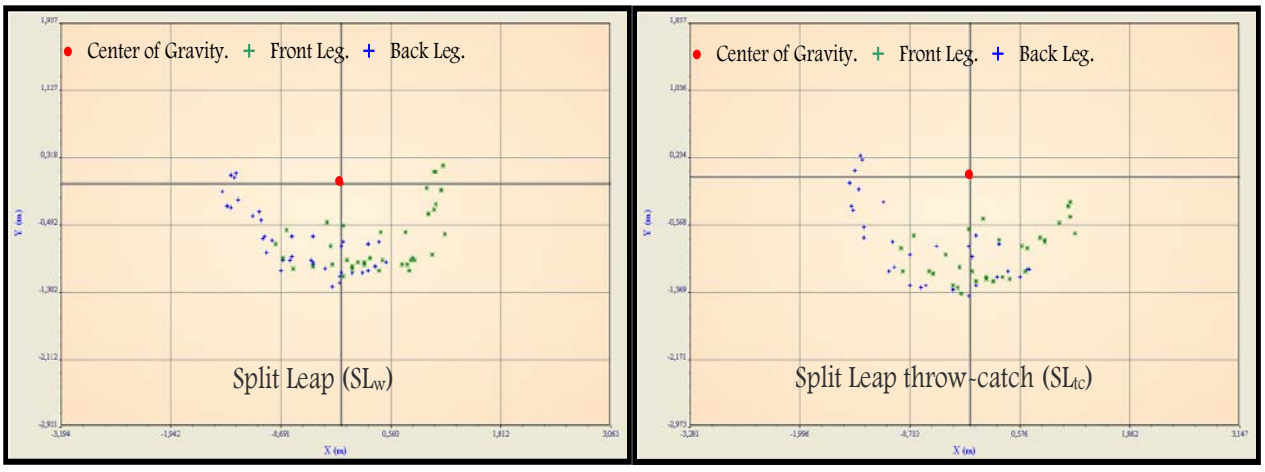

Figure 3. *Vertical displacement of the lower limbs from the Center of Gravity.*

The angle of split, decreased from 185.2° to 180.6° respectively for (SLw) and (SLtc) especially for the front leg, (figure 3).

DISCUSSION

Kinematic analysis of the split leap executed with and without throwing catch of the ball shows that the two jumps are different at the following levels in the preparation and takeoff phase and in arms swing during the flight phase and in landing. Results show that in the preparatory phase the initial velocity is greater for the jump executed without apparatus which is confirmed by the work of Sousa and Lebre (1996) and Abd El-Hamid (2010). Similarly the power and strength developed are more important than the jump with apparatus. This drop can be explained by a weakness in the lower limb strength since the tested gymnasts developed a relative strength fairly low compared with values published by Gross et al (1996), 20.2N/kg vs. 36.6N/kg respectively. Indeed, several authors have so far determined the positive influence of power dimension and the performance efficiency in rhythmic gymnastics (Wolf-Cvitak, 1984; Hume, Hopkins, Robinson and Hollings, 1993). Nevertheless the vertical velocity and speed of slit of the legs increase significantly during the SLtc. This raise in vertical velocity can be explained by the arm action when throwing while the speed of split of the legs is just a compensation for the decline of vertical movement in order to give more attention to the apparatus. According to Miletic et al. (2004), the highly pondered component in the performance evaluation of the SLtc, is related to the height of the leap jump executed. Thus, the correlation with the dimension of explosive-strength is embodied. Finally, this variation of executions factors during the in the split leap with throw-catch of the ball, can be linked to the blind landing by gymnasts since their eyes keep following the path of the ball which influences technical execution of the leap.

To summarize, we can attribute these differences in the deployment of qualities of strength, speed and flexibility to an important focus on the apparatus. The attention, which may seem necessary to perform a task, can have the opposite effects if it is too high and therefore block the correct implementation of a gesture as reported in Wallon (1959). Similarly, competition between resources of the two tasks can modify the motor performance. There are then a major task and a secondary task (Brisswalter and Legros 1996)

Accordingly, the obtained values and their variations indicate clearly that the gymnasts studied did not reach the level of automation required for optimum performance. In fact, the SLtc is among the most complicated element. A gymnast has to execute a very complex element, consisting of manipulation with the ball, then simultaneous leaping and throwing, which are followed by soft landing and synchronized ball catching.

Perfection in training is essential for a translation into a high performance. Improper training usually causes improper muscle recruitment and automatism. We recommend that during initiation on the gymnastics' jump with apparatus coaches should automate the jump and improve the physical quality of execution before introducing apparatus. Performance is seen as an image of training.

CONCLUSION

The main results of kinematic analysis performed in both jumping, show a significant variation of the following parameters: initial velocity, vertical displacement, strength (vertical and horizontal component), peak power and angular velocity of the split. The initial velocity on take-off was the kinematic parameter with more influence on the performance of the gymnasts during the execution of these jumps. The results showed also that probably gymnasts did not

perform a split leap with throwing ball the best way that could.

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Slovenski izvlečki / Slovene Abstracts

Anton Gajdoš, Maria Provaznikova, Stephen J. Banjak

150 LET SOKOLSKE TELOVADBE NA ČEŠKOSLOVAŠKEM, ČEŠKI IN SLOVAŠKI REPUBLIKI

S telovadbo v slovanskih državah so pričeli leta 1862 v Pragi z ustanovitvijo Sokolskega društva. Vodja Miroslav Tyrš je ustvaril močno organizacijo, ki je tudi za časa Avstro Ogrske monarhije tekmovala na olimpijskih igrah pod imenom Bohemia. Po prvi svetovni vojni se Čehi in Slovaki združijo v novo državo Češkoslovaško. Čas med svetovnima vojnama je bil najbolj uspešen z mnogimi zlatimi medaljami na olimpijskih igrah in svetovnih prvenstvih. Po drugi svetovni vojni je komunistična stranka prevzela vodilno vlogo pri razvoju telovadbe in bila zelo uspešna pri ženski telovadbi; Vera Časlavska je najboljša telovadka tistega časa. Po žametni revoluciji je Češkoslovaška razpadla na dve državi Češko in Slovaško Republiko. Tradicija telovadbe se zopet nadaljuje pod Sokolskim imenom.

Ključne besede: zgodovina, gimnastika, Češka, Slovaška.

Myrian Nunomura, Yoshinori Okade, Paulo Carrara

KOLIKO TRENERJI RES VEDO O MOTIVACIJI NJIHVIH TELOVADCEV

Šport zelo pritegne otroke in mlade po vsem svetu, verjetno zato, ker mnogi od njih sanjajo kako tekmujejo na olimpijskih igrah, kako postanejo prvaki in so denarno nagrajeni. Žal pa se jih le malo zaveda obveznosti in velikega samoodrekanja, potrebnih za uspeh. Namen študije je bil analizirati kako brazilskih trenerji dojemanje motive svojih športnikov ter kako se spopadajo s tem vprašanjem. Rezultati so pokazali, da gimnastika zahteva visoko motivacijo telovadcev za vadbo, in nekaj strategij, ki jih uporabljajo trenerji za motivacijo telovadcev je treba natančno pregledati in oceniti. Druge motivacijske strategije so omejene zaradi okoliščin športa v Braziliji, zlasti glede naložb v osnovne pogoje dela in podporo telovadcem.

Ključne besede: Gimnastika, motivacija, trenerjevo zaznavanje.

Fernanda Faggiani, Allistair P. McRobert and Zoe Knowles

RAZVOJ PRED NASTOPNIH VAJ PRI AKROBATIH: ŠTUDIJ PRIMERA MLADEGA AKROBATA

Kombinirana metoda je bila uporabljen za pregled razvoja in pridobitev osebnih navad prednastopnih vaj (PPR) pri mladem akrobatu. Akrobat je izpolni test O uspešnosti strategij nastopa, bil intervjujan s pol-strukturiranim intervjujem z ogledom video posnetkov, naj preuči svojo pripravo na nastop pred in po 6 mesecih uporabljanja PPR. Uporaba PPR je učinkovito izboljšala akrobatove nastope. Akrobat je dosledno izvajal PPR pred izvedbo, ter s tem izboljševal nadzor in samodejnost svojih skokov. Čeprav je bila uporabljena metoda PPR uspešna, jo je potrebno tudi v bodoče raziskovati.

Ključne besede: pred nastopne vaje, PPR, kombinirana metoda, študij primera.

Proios Miltiadis, Mavrovouniotis Fotios and Proios Michalis

PREDLOG PSIHIČNE PRIPRAVE PRI TELOVADBI

Psihološka priprava športnikov je del celotne športne priprave. Vendar pa je izvajanje psihološke vadbe programov pri telovadci precej omejeno in nima vedno jasnega izida. Namen prispevka je pripraviti seznam predlogov za razvoj psihološke vadbe v športni gimnastiki. Znotraj seznama predlogov se je potrebno usmeriti v naslednje cilje: (1) krepitev notranjih motivov, kot je volja, (2) izogibanje negativnih čustev, kot je strah, in (3) izvajanje vrsto drugih dejavnosti obravnavanih v članku.

Ključne besede: športna gimnastika, psihologija, vadba.

Mateja Kunješić

PRIČAKOVANJA STARŠEV OTROK VKLJUČENIH V TELOVADBO

Cilj raziskave je ugotoviti razloge za napotitev otroka v gimnastiki, kot so pričakovanja uspeha v športu in odnos staršev do vadbe. Na vzorcu 55 očetov in 60 mater otrok športnikov, je bil uporabljen vprašalnik za ugotovitev stališč staršev do pričakovanjih dosežkov njihovih otrok v gimnastiki. Uporabljena je bila opisna statistika, korelacije in hi-kvadrat test. Najpomembnejši razlog za vključitev otroka v gimnastiko je pozitiven vpliv gimnastike na zdravje. Rezultati hi-kvadrat testa so pokazali, da ni statistično pomembnih razlik med materjo in očetom pri razlogih za vključitev svojega otroka v gimnastiki, niti pričakovanj pri dosežkih otroka.

Ključne besede: otroci, stališča, oče, mama, gimnastika

Bessem Mkaouer, Samiha Amara, Zouhair Tabka

DEJAVNIKI IZVEDBE SKOKA VISOKO DALEČ Z IN BREZ ŽOGE V RITMIKI

V ritmični gimnastiki je kakovost izvedbe prvine odvisna od znanja, pa tudi gibalnih zmogljivosti ritmičarke. Cilj naloge je bil ugotoviti dejavnike, predvsem moč, hitrost in gibljivost pri izvajanju skoka visoko daleč z in brez žoge. Pet ritmičark starih od 12 do 15 let članic Tunizijskee reprezentance v ritmični gimnastiki je po štirikrat izvedlo skok z in brez žoge. Na osnovi 2D analiza gibanja smo ugotovili značilne razlike med obema vrstama skokov. Razlike so pri hitrosti in sili odriva v vodoravni in navpični smeri, višina in dolžina leta, čas leta ter kotno hitrostjo pred/za noženja v letu. Rezultati so pokazali, da imajo merjene ritmičarke še rezerve pri skoku z žogo.

Ključne besede: skok visoko daleč, sila, hitrost, kotna hitrost, ritmika