

The 1st World Javelin Conference

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Kuortane, Finland

Introduction

Although the history of athletics has seen great javelin throwers from many places around the world, Finland is generally acknowledged as the spiritual home of the event. Nowhere is our sport's community or the general public more focused on or knowledgeable about this discipline.

It was fitting therefore that the 1st World Javelin Conference should be held in Kuortane, in the west of the country, from 9 to 11 October 2009. The conference, which was one of the four-conference 2009 European Athletics Coaching Summit Series, attracted 77 participants from 23 countries, amongst whom was an incredible line-up of coaches, scientists, ex-champions and current top throwers who shared their experience and knowledge through a programme of presentations, practical demonstrations and open discussions. It was hardly surprising that everybody who attended left inspired and excited to put what they had learnt into action in the season to come.

Conference organiser Tapio Korjus, the 1988 Olympic gold medallist who is now the Manager of the High Performance Training Centre at the Kuortane Sports Institute, led the official opening and also made two presentations. Among the guests of honour for the weekend were all-time greats Uwe Hohn, who threw for the former German Democratic Republic and was the first to reach 100m with a javelin, and Janis Lūsis, the Latvian who competed for the former

Soviet Union and over the course of his international career won a complete set of Olympic medals and four European Championships.

In the sections below we give brief descriptions of our experiences at the conference.

Day 1 – Afternoon Session

Friday was arrival day for most of the participants. The first activity, which started in the late afternoon, focused on young javelin throwers and Finnish training methods for developing talented juniors. Hannu Kangas, Finland's Head Coach for Javelin, and Kuortane Sport High School coach Petteri Piironen led the session. It included very practical elements such as drills for throwing technique and special strength training exercises demonstrated by students from the school.

Day 2 – Morning Session

The programme of Saturday morning featured the official opening ceremony and presentations focusing on biomechanics and technique that were delivered by three top Finnish experts: Jukka Viitasalo, the Director of the KIHU, the Research Institute for Olympic Sports in Jyväskylä, Riku Valleala the Communications Manager at the KIHU and Tapio Korjus.

In his presentation, entitled "Biomechanics of javelin throwing (with reference to feedback

for coaches)” Viitasalo focused on the factors that affect the distance of a javelin throw, covering: release velocity, release angle, release angle of attack, release angle of yaw, release pitching movement and aerodynamic factors. His conclusions were:

- among elite javelin throwers the release velocity was the best parameter to predict the throwing distance both at group and individual level;
- the release angle has a significant relationship with throwing distance only at individual level;
- the angle of attack did not alone significantly affect the throw distance;
- there is only one optimal technique for any particular thrower but it varies considerably between individuals;
- what is optimal in respect of throwing physics is not necessarily optimal in respect of the neuromuscular functioning.

Valleala followed with a presentation entitled “Biomechanical factors of throwers’ actions in javelin,” which concentrated on the

findings that have been made in biomechanical analysis of javelin throwing and showed us facts and findings from various projects. He discussed how different throwers have different correlations between a good throw and the different measured factors. Viitasalo had already told us that release velocity is the most important factor for determining throwing distance, but what makes the release velocity and how can we maximise it? According to Valleala, release velocity (or speed) equals the sum of the forces that are applied to the javelin. Figure 1 shows the components that are involved. His conclusion was that there are several common biomechanical factors affecting the throwing distance, but there are also other variables that may be important at individual level. Optimal technique therefore is always an individual thing, but should reference well-known biomechanical facts.

Korjus completed the morning session with his presentation entitled “Throwing technique – basis and variations”. Drawing on his expe-

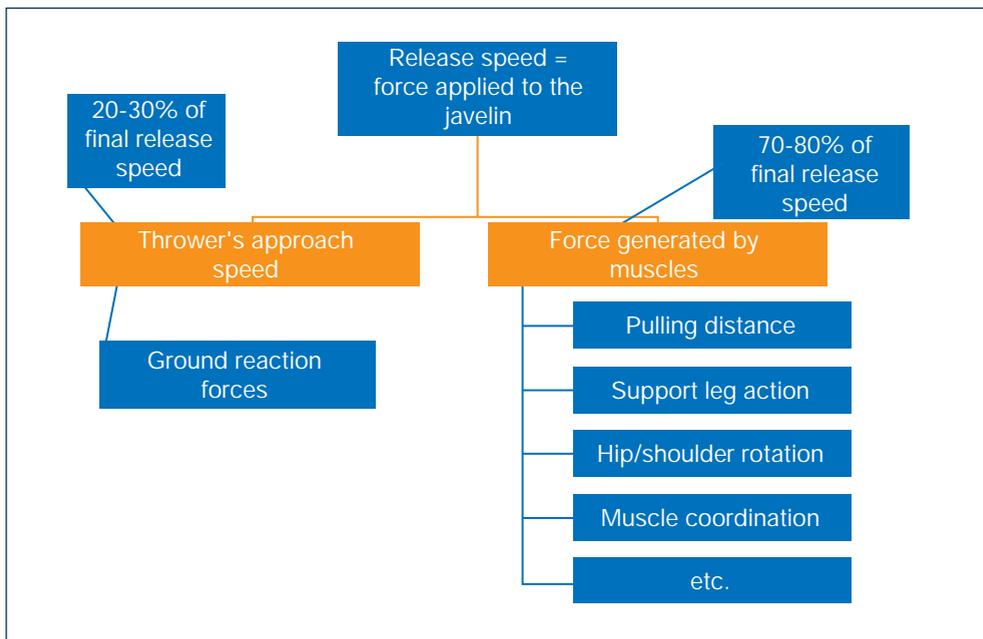


Figure 1: Factors affecting throwing distance in the javelin



Helge Zöllkau (l) and Steffi Nerius describe Nerius's career and training methods

Photo: Riku Valteala

periences as a top performer and coach, he talked about the basic elements of javelin throwing and different styles of javelin throwing technique. He also showed a number of video clips of different throwers using different run-ups and styles of throwing

Day 2 – Afternoon Session

After lunch the focus turned to training with first a presentation by European and World Champion Steffi Nerius (GER) and her coach Helge Zöllkau (GER) and then one by World Champion Tero Pitkämäki (FIN) and his coach Hannu Kangas (FIN).

Nerius and Zöllkau detailed Steffi's career as a javelin thrower and their experiences. Steffi talked about her childhood and how she started with volleyball and throwing the javelin and then concentrated on the javelin after being told she was too short (178cm) for volleyball. We were told about her struggle to perform good throws when it counted in the beginning of her career and how she was able to change that around after working with a sport psychologist. Zöllkau focused more on the design of the training

year and also showed some video clips from Steffi's training. He said that in an average week there would be four to six training sessions and at the most seven to nine sessions in a week and then pointed out the need for balance between load and recovery. They used a single periodisation with the different phases of: general training, maximal strength, specific strength and specific throwing. We were also given examples of what the different phases included. Steffi was asked about her test results for various lifts and jumps and most of us found them quite impressive.

Next up were Pitkämäki and Kangas, who told us about their training philosophy and approach to the event. Kangas strongly emphasised the need for a strong base and good general physique, saying that Tero had done serious training for cross-country skiing when he was younger and that they both believe it has helped him to recover faster from hard training and avoid major injury. He still does hour-long cross-country skiing training during the winter. Another thing in which they strongly believe is the correlation between high intensity training and recovery. Tero generally trains one time per day, but the



training session can be quite long and have big loads, especially a high number of throws.

The two presentations were followed by practical demonstrations in the indoor hall. Steffi led off by showing some event specific strength training that focused a lot on the hip movement, the block and the power position of the throw. Tero's demo was a bit longer as he first gave an example of the type of contrast training he does in the weight room and then he showed some of the event specific strength exercises that he uses.

Dr Montse Ruiz (ESP), who works in the Department of Sport Sciences at the University of Jyväskylä, completed the afternoon session with her presentation entitled "Analysis of results in javelin throwing". She told us about the result trends in the history of the event and she then examined the performances of top athletes over the season, focusing on the question of whether they are able to peak at the time of the major championships.

A good dinner with all the participants rounded out Saturday evening.

Day 3 - Morning Session

The first part of the morning of the final day was given over to discussions of javelin-related injuries and rehabilitation by Docent Heikki Jaroma (FIN) from the University of Kuopio and Dr Mark Fletcher (USA), Head of Medical Services at the Oregon Track Club.

In his presentation entitled "Upper extremity injuries in javelin throwers: etiology and treatment", Jaroma explained that there are many weak points for the javelin thrower, including the shoulder, elbow, low back, knee etc. He described the complex anatomy of the shoulder girdle and its vulnerability as the most moveable joint in the human body. After discussing the stabilising muscles of the shoulder he looked at the phases of the throwing movement in which these muscles are utilised and listed the different types of related injuries. Using a willing "guinea pig" from the audience, he demonstrated the tests for instability of the shoulder. He then showed videos of surgical operations he has carried out on the shoulders of injured world-class throwers and described the post-operative rehabilitation process, which generally requires four weeks of immobilisation and no throwing for twelve weeks. Turning to the elbow joint, he again went through the anatomy and the different types of injuries that a thrower can experience, including distraction of the ulnar nerve, chondral lesion and ulnar collateral-ligament avulsion. He showed another video (definitely not for the faint hearted!) in which we saw the reconstruction of the ulnar collateral ligament. One of his important messages was that arthroscopic techniques (rather than open surgery) are best in order for a thrower to achieve a full comeback from injury.

Fletcher continued on the subject of shoulder injuries and their rehabilitation in his presentation. He compared the throwing action of a baseball pitcher with that of a javelin thrower, highlighting the similarities, and then described a study using EMG technology to determine the muscles involved and measure the contractions that occur in each phase of the throwing action.

Interestingly, the release of the javelin is the least stressful part of the movement, as the energy in the muscles has already been built up during the previous phases, whilst the deceleration phase is the most violent, as all muscles fire maximally. Typically, injuries occur



Tero Pitkämäk gives a demonstration in the training hall

Photo: Riku Valteala

in the late cocking and deceleration phase of the throw. Turning away from traumatic injuries, he said that javelin throwers tend to show signs of increased external rotation and decreased internal rotation due to adaptations that occur throughout their career and showed the first sign of shoulder problems due to the increase in internal rotation

between the throwing and non-throwing arm. He then offered a very useful directory of rehabilitation exercises and emphasised the importance of daily stretches to the posterior inferior capsule of the shoulder, as this directly affects the biomechanics of the shoulder and can increase internal rotation. He concluded by saying that to decrease the risk of

injuries, such as laberal tears, rotator cuff tears and subacromial impingement, it is important to correctly periodise throwing volume and intensity, schedule rest into the training programme and look carefully at the competition schedule to ensure the stress on the body is correctly managed.

In the last part of the morning the focus turned again to training and coaching. Åsmund Martinsen (NOR) the coach of double Olympic Champion Andreas Thorkildsen (NOR) gave a presentation in which he talked about their successful partnership stretching back 1999. He said the technical model he bases his coaching on is inspired in part by Zelezny (CZE), Backley (GBR) and the Finns and showed videos that highlighted Andreas' technical progression from the age of 17. Emphasising that it is imperative to balance the technical level of the athlete with his/her physical ability, he described the development of Andreas' physical ability and the tests used, including a five-step jump (with and without run-up), vertical jump, 40m sprint, 20m flying sprint and back jerk. It is important for Andreas to have great stabilising strength and good balance in his body. A drill he uses for this is doing cross-steps with 6kg dumbbells across a gymnastics balance beam! Having a good physical level means that Andreas does not have to take chances to chase better results, as he can handle the immense power that he possesses. The basic training that Andreas undertakes at this stage of the year was shown to the group. This includes core and pelvis strengthening exercises and coordination drills. Martinsen finished by showing video of the gymnastics movements that are integral to helping Andreas maintain his poise and balance in the throw. These clips can be found on Andreas' website!

Day 3 – Afternoon Session

After lunch the conference reconvened to continue on the topic of training and coaching. The presentation was made by Korjus

and his athlete, world and European championships bronze medallist Mikaela Ingberg (FIN). Mikaela described her career from first picking up a javelin at the age of ten to the present day. She showed videos of her technical development and how injury has affected her throwing. Korjus then gave insights into Mikaela's characteristics as an athlete in terms of ambition, coordination, enthusiasm and planning. This led on to a discussion of key factors for coaching female javelin throwers. Slight differences between male and female throwers were highlighted and areas to focus on were described, such as upper body strength, throwing power, javelin control, and shoulder and elbow rehab. The need for an athlete to take responsibility for his/her own technique was also flagged, as it is necessary order to be independent in competition and make appropriate changes under pressure.

The official programme concluded with a panel discussion during which all the presenters answered questions posed by the audience of participants. The points covered ranged from technical coaching points to the environmental pressures for the modern javelin thrower to results progression.

Reported by Goldie Sayers and Mikaela Ingberg

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Further information on the European Athletics Coaching Summit Series can be found in the "Development" pages at www.european-athletics.org.