DIFFERENCES IN MEN'S AND WOMEN'S TRAINING FOR THE JAVELIN

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This article, originally published in "The Throws – Official Report of the European Athletic Coaches Association Congress, 1987" is an excellent analysis of training regime differences between male and female throwers. Re-printed with permission from the European Athletic Coaches Association.

The principle point is to have a knowledge of women's development and specific women's problems. Only on that basis is it possible to gain deeper knowledge of women's programming and training. It should not be forgotten that the role of the coach as a psychologist is more demanding in women's training. Confidence can be based only on good cooperation. Good results again are based on cooperation. However, women are mostly more open and, thus, co-operation is mainly a matter of knowledge and attitude. For example: women more easily display matters connected to their consistency and their various moods. The most critical moment seems to arise when the coach has other athletes too — the female athlete appears jealous, she thinks the coach concentrates more on the others than on her. One could say that the female athlete depends more on the coach, who should commit him / herself only to her.

In stress situations, women are stronger than men, both as coaches and athletes, provided there is a well - working coaching relationship.

In this paper, I will a few times refer also to the woman's role in society. This happens to be a question that partly weakens women's potential to develop in the intended direction and to the required level. The female athlete must find an employer prepared to accept her for part time or half day work. In general, male athletes more easily find employers who accept part time working because of sport. When a female athlete travels to a competition, the employer's attitude is frequently: what a nice trip with all those places to see - but doesn't it last a little bit too long? Don't you think you could see the sights in a shorter time?

One of the coach's tasks is to make the employer understand his attitude is false and to make him take a more correct standing. Many times men are a hindrance to women's athletic development, for instance by jealousy making them stay at home as much as possible - no matter whether the woman needs time for sport or anything else.

As a rule you could say that a female athlete needs a decisive coach who isn't her closest friend. A strong and balanced relationship is an exception. In order to

describe the basic nature I might say that a woman is soft and a man is aggressive and competition-minded. On the other hand, women have in some sports, greater advantages, being more careful and tenacious of purpose than men. Especially because of this last mentioned quality, a female coach is always in a better position.

It is important that the female athlete realizes that competing takes place as a person, not only as a woman. Women more frequently give up a competitive career earlier than men. Thus, it is important to see that women need more support in order to reach their aims and goals in sport. A woman's maturing process is difficult; at that time women sometimes have to train twice as much and twice as hard in order to avoid excess weight. Therefore, also development at this stage is difficult. At later stages, especially in working life, women meet new difficulties as employers are much harsher to women than men - female sports still are considered of little value in most societies. This is an attitude to be met also in other surroundings such as social life, cultural thinking etc. (no equality to be found!).

Results can be achieved only by introducing the principles of men's strength training into women's training!

There are a great number of structural differences between men and women and in order to make and reach good results in women's sport one has to have cognizance of these differences. Approximately 40% of men's body weight consists of muscle - compared to women's some 27%. Women are clearly shorter than men and proportionately women's legs are shorter. Because of weaker support tissues, women run greater risk of injuries. On the other hand, though, a woman is tougher and she stands more pain than a man. In general, women are some 10 cm shorter, some 10 kg lighter and they have some 25 % shorter legs than men. The hip is low and broad and also weaker. Women's bodies contain more fat and less muscle, compared with men. Women's strength level, proportionately measured, is 50-80 % of men's strength.

In skill disciplines, women can develop their techniques faster and more readily. Because of the above mentioned differences a coach, who does not take the importance of these factors into consideration - as well as the influence of the menstruation cycle (most individual!) - can easily apply a masculine program without any thoughts regarding the consequences. Actually, the differences are so significant that they simply must be taken into consideration when coaching a woman!

Also appearance factors affect women's development into top athletes. There might be great differences depending on the discipline, but for the time being the trend is towards the so called slim line.

If a woman's fat tissue is perceptible and the amount is more than wanted, the diet is wrong when speaking of a hard training athlete.

Analyses have shown that a so-called self-doping process takes place in hard training women. This phenomenon sets in and has received its name through the significant increase of testosterone as a result of the training.

It seems that a female athlete more easily catches a cold than a male athlete. Vitamin C has proved to be a good aid to maintaining health. A female athlete needs lots of iron and she has to undergo regular controls.

In so called normal cases a woman loses 36 days a year of training because of menstruation, having thus extra rest or doing just some ineffective exercises. This is quite a share of the total training days per year!

Mentally and especially socially it is more difficult for women to realize that they have to train more and more even though development rate slows. Nevertheless, women are approaching the men's results and in some cases at a fast pace. It is most interesting but very difficult to make prognoses for the future.

Strength can be achieved in many ways and the results are still alike. However, it is important to make exact plans regarding amount, intensity, mode (including technical skills) and loading level (weight amounts) - all these according to ability and needs. Sports injuries often create problems, if the plan has been incomplete and/or incorrect.

Today, children are encouraged to play more demanding games - unfortunately girls are not always accepted in these. Parents hold too tightly to their daughters and, therefore, it is difficult for girls to develop later to top athletes. However, we all know that the future can be built only on a well-established basis.

Weak points must be developed as well as alongside strong ones. For instance a woman is able to absorb more iron a year than a man. It is obvious that women will reach surprising results in sport.

Anatomical differences

Because of the anatomical differences compared to men, more attention should be paid to female javelin throwers' training, especially as far as strength, technique, and speed capacities are concerned. Especially regarding young female javelin throwers in the beginning of their career, the attitude is the first thing making training of the above mentioned capacities more difficult.

Weaknesses (compared to men):

1. Smaller relative proportion of muscles in the body weight and greater fat percentage.

2. Poorer hormone producing - testosterone production is some 10-11 times smaller than men's.

3. In general weak middle and upper trunk.
4. Natural slowness because of small and weak muscles.
5. In general poorer technical skills and weaker implement control.

Strong points

1. Greater training capacity.
2. Better mental balance.
3. At an earlier stage able to stand intensive training.

Strength level / strength training

In Finland, talents in track and field are generally discovered at the age of 14-15 years and then they are selected for training programs of various levels under the association's supervision.

There are practically no exceptions concerning girls selected as javelin trainees: they all have poor muscle condition and strength level. Concerning boys, this is by far not such a big problem.

In general, the first task of the coach / coaches is to influence the athletes' attitude towards strength training, especially in the case of girls. It is easier to make the boys understand and to make them train with the barbells and in the gym.

Strength training for girls - during the first few years it actually could be named muscle condition training - must have a careful and versatile start. First they have to be taught to perform muscle condition exercises by using only their own body weight. Also training ball exercises and throwing of various shot-weights also forms part of muscle condition training. Gradually, as the muscle condition improves and strength increases, light weights can be used. The next thing to learn is lifting techniques for strength training exercises.

The most common strength training exercises are: snatch, clean and jerk, clean, squat, half squat, hyperpulls.

When the athlete satisfactorily masters the techniques of the above exercises, training with weights can be included. A beginner needs normally 1-2 years for this.

For the beginner, gymnastics is the best kind of muscle condition and strength training exercise and an athlete should keep up these exercises throughout her career.

In general boys, when joining training groups of various levels, are better prepared to start strength training immediately, thanks to their better muscle condition. Furthermore, their attitude towards strength training is as a rule positive. On the contrary some boys might see it as an end in itself, which certainly is not of benefit for the actual throwing performance. Transforming boys' strength so that it serves the discipline and using it to produce distance is often neglected because of too intensive strength training. Too much strength training may result in various injuries.

Because of the change in the social structure - from agricultural to urban industrialized society - the general strength level of javelin throwers has significantly decreased during the past 10-15 years. According to a survey among male javelin throwers in 1976 out of the ten (10) best Finnish throwers seven (7) were able to clean 150 kg. In 1986 there were only two (2) out of the ten (10) with this result, the result of the others was far less than 150 kg.

No similar comparison has been made concerning women. Compared to boys at the same stage, girls should carry out more strength training exercises, if not in amount at least in duration and number of repetitions. In women's strength training the exercises for the upper body and the middle trunk should be stressed. The legs must however not be forgotten.

When, with the help of a changed attitude, women's weight training has become possible, strength training serving the discipline also becomes possible. In principle, when keeping the repetitions to max. six (6), even if training with heavy weights, no lactic acid is produced in the muscles and, thus, the muscle volume does not increase (no hypertrophy). First, the athlete's weight decreases and he/she gets slimmer, as extra fat in the organism is being burned through strength training and by training in general.

Natural aptitude for throwing, throwing experience and javelin technique

Finnish boys have a natural aptitude for throwing as the country is rather thinly settled - there is space to throw, people live close to nature, there is a throwing tradition.

In summertime, boys throw pebbles in the lakes, cones in the woods and in wintertime snowballs. Thanks to this throwing experience from childhood, boys have better qualifications to control the implement (the javelin) and to learn the discipline technique better and faster than girls.

Pesãpallo is the Finnish national ballgame. It is a variation of American baseball. The players throw, during the game, a great number of times the ball weighing 150-180 grams. Pesãpallo is a very popular game in school sports. Girls gain practically their only childhood throwing experience when playing this game.

However, the throwing technique of Pesapallo could be considered negative as it is quite different from the javelin technique. As the ball is light, it is thrown beneath shoulder level with the elbow in front by slinging the ball, compared to the javelin which is thrown above shoulder level and along the trunk line.

Little throwing experience could be considered as the greatest hindrance for girls to learn the javelin technique. Girls do not, in their childhood, throw pebbles, cones, and snowballs like boys. At an early training stage girls are not in the same way ready to perform a great number of throws in order to learn the javelin technique and the control of the implement as boys. In the beginning, technique is not as important as the great number of throws, which develop throwing endurance and throwing experience.

For girls, the javelin is a difficult implement, hard to control. Their implement control is poorer than the boy's because of the smaller number of throws made at the beginning of training. To improve this, there is only one way: throwing experience can be increased only by great quantities of throws.

An example of implement control:

When comparing the results achieved with a javelin and a weighted ball, both weighing 600 grams, certain conclusions regarding implement (javelin) control can be made. The different flying and gliding qualities of the implements have been considered in the comparison. If the javelin result is better than the result with the weighted ball the thrower controls the implement.

If the throwing weight result is better than the javelin result = the thrower has certain problems with the discipline technique or the implement control. This simple test gives pointers for training and for training emphasis in order to develop the various qualities:

- Pia, 17 years 600 g weight - 38 m / javelin - 51.32m
    - — the javelin flies better than the weight
- Riikka, 17 years 600 g weight - 47 m / javelin – 46m
- Eija, 18 years 600 g weight - 46 m / javelin - 44m
    - — the weight is easier to throw than the javelin.

An equal follow-up has been made among boys and, with very few exceptions, their javelin results were better than the results of weight-throwing.

Women can achieve good javelin results, good implement control, even in a short time by carrying out more throwing exercises than men. Women have too little throwing experience. In the beginning, quantity is more important than quality.

Presently, in Finland, 10,000 training throws a year is considered an average throwing amount, +/- 2-3000 throws depending on the athlete.

Of the total amount, 30-50% of the throws are performed with a javelin. The difference, 70-50 %, is usually performed with various throwing weights:

- Women normally use throwing weights of only 400-600 grams, which is underweight. Throws with weights of 700-900 grams (even 1kg), which is overweight, are less frequent, about 10-15 % of the total.

- When using the smaller weights, it is easier to concentrate on learning the throwing technique. Another goal is to learn discipline speed. The big weights are used for developing discipline strength together with discipline technique.

- In normal throwing exercises men, more frequently than women, use the regular implement and weights of 800 g-1kg, i.e. overweight. For developing discipline speed, implements of 400-700g weight are used and for developing discipline strength weights of 1-1.5 kg sometimes even up to 20 kg.

	WOMEN		**MEN**	
	16 yrs	22 yrs	16 yrs	22 yrs
JAVELIN	3 000	5 000	2 000	5 000
UNDER-WEIGHT	3 000	4 000	1 000	2 000
OVER-WEIGHT	700-800	1 500	3 000	4 000
TOTALLY	**6 800**	**10 500**	**6 000**	**11 000**

The intensity and the differences in the throwing exercises depend on anatomical differences and also on the weight difference between men's and women's competition implements.

Regarding the content of the throwing exercises

Standing throws should not be done after the first stage (the first year), at all, just as warming-up for throwing exercises.

In indoor-training during winter the main emphasis in throwing exercises should be on cross-step approach throw and bounding stride approach throw (at an approach of 6-8 strides when throwing at a rhythm of 5 strides) (estimation approx. 85%).

Some throws at below and at full speed should be made during practically each training session and their number increases closer to the beginning of the competition season (totally approx. 15**%).**

Periods and rhythm:

Earlier, in Finland the so called one-single period tern was applied and the training year was divided follows:

- Basic training period 1: October-December
- Basic training period 2: January-March
- Preparative period April-June
- Competition period July-August
- Transition period September

This year, a new division has been adopted. For the first time, throwers will apply the so called double period-system. The first period is terminated at the end of March, at the indoor championships (unofficial Finnish Championships). The second period ends normally after the summer competition season.

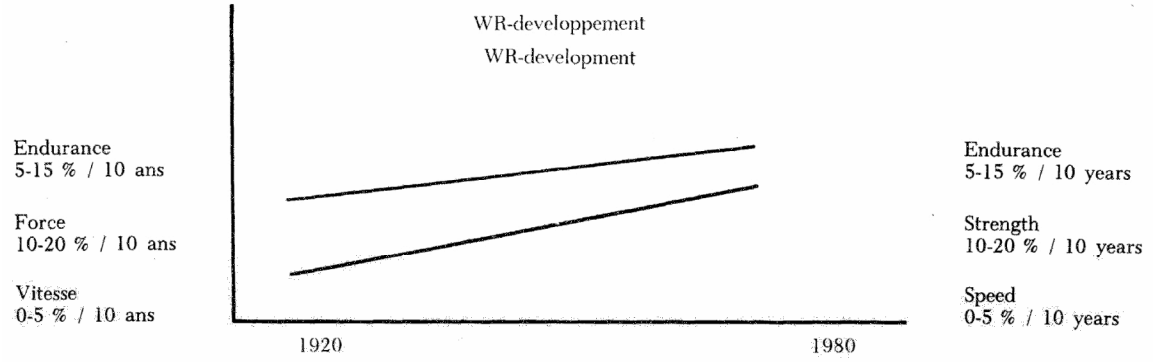
The new division is as follows:

- Basic training period 1: 8 weeks 13.10-7.12
    - general endurance, muscle condition, specific strength (throws).
- Basic training period 2: 8 weeks 8.12-1.2
    - max. strength, large quantity of throws.
- Preparative period: 5 weeks 2.2- 8.3
    - speed strength/specific strength, technique, speed.
- Competition season: 3 weeks 9.3.-29.3
    - explosive strength, discipline speed.
- Basic training period 1: 4 weeks 30.3-26.4
- Basic training period 2: 4 weeks 27.4-24.5
- Preparative period: 6 weeks 25.5- 5.7
- Competition period: July - 15.9

- Transition period 3-4 weeks

During the second period, the development of the same qualities as during the first period are emphasized.

The rhythm varies between 3:1, 2:1, and 1:1.



Le développement des quantités et des qualités de l'entraînement est parallèle. Il n'y a pas de limite supérieure. QUELQUE CHOSE DE NOUVEAU DOIT ÊTRE DÉVELOPPÉ.

The development of training quantities and qualities is parallel — there is no upper limit — SOMETHING NEW HAS TO BE DEVELOPED

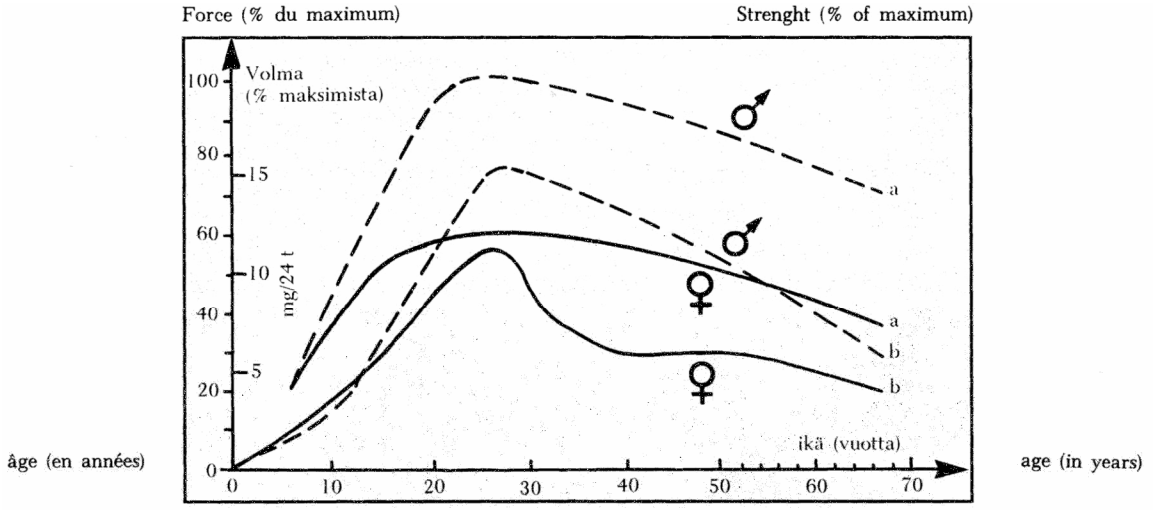


Tableau 31: Force (a) et sécrétion d'hormones sexuelles (b) pendant la vie de l'homme en relation avec l'âge et le sexe (hettinger 1966).

Table 31: Strength (a) and secretion of sex hormones (b) during man's life in relation to age and sex (Hettinger 1966).

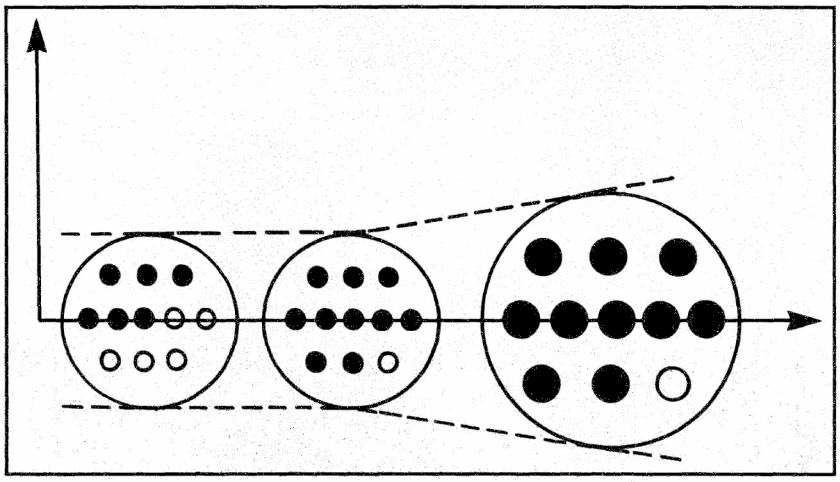


Tableau 32: Mécanisme de l'entraînement de la force : d'abord les fibres à l'intérieur du muscle s'améliorent, et seulement après la taille des fibres augmente ; o) contractée, oo) cellule musculaire non contractée (d'après Fukunage 1975).

Table 32: Mechanism of strength training: first the nerve inside the muscle improves, only after that the size of the muscle cells increase; o) contracted, oo) non-contracted muscle cell (according to Fukunaga 1975).

HOMMES		**MEN**
WORLD MONDE	**YEAR**	**FINNISH FINLANDAIS**
78.70	1950	78.70
86.04	1960	83.56
92.70	1970	92.70
96.72	1980	93.90 (–73)
104.80	1984	93.90
85.74	1986	81.72
53.41	1950	43.79
59.55	1960	48.17
62.40	1970	55.60
70.08	1980	61.02
74.76	1984	74.76
77.44	1986	74.76

1932	42.68	
1936	45.18	10. Irja Lipasti 33.69
1938	45.58	
1946	46.25	
1948	45.57	2. Kaisa Parviainen 43.79
1950	47.55	
1952	50.47	14. Anni Rättyaâ 40.56
1954	52.91	
1956	53.86	
1958	56.02	
1960	55.98	
1962	54.93	
1964	60.54	
1966	58.74	
1968	60.36	8. Kaisa Launela 53.96
1969	59.76	
1971	61.00	
1972	63.88	
1974	67.22	
1976	65.94	
1978	69.16	
1980	68.40	
1982	70.02	4. Tiina Lillak 66.26
1983	70.82	1. Tiina Lillak 6. Tuula Laaksalo 62
1984	69.56	2. Tiina Lillak 69.00,T. Laaksalo 66.40
1986	76.32	4. Tiina Lillak 66.66

Année **Year**	**Distance** **Distance**	**Place, Nom, Prénom, Perf.** **Place, Name, Surname, Perf.**	**Place, Nom, Prénom, Perf.** **Place, Name, Surname, Perf.**
1906	53.90 wr	5. Verner Järvinen 44.35	
1908	54.82 wr	4. Aarne Salovaara 45.89	5. Armas Pesonen 45.18
1912	60.64 wr	2. Julius Saaristo	4. Juho Halme 54.65
1920	65.78	1. Jonni Myyrä	2. Urho Peltonen 63.50
1924	62.96	1. Jonni Myyrä	4. Yrjö Ekqvist 57.56
1928	66.60	4. Paavo Liettu 63.86	6. Eino Penttilä 63.20
1932	72.71	1. Matti Järvinen	2. Matti Sippola 69.80 3. Eino Penttilä 68.70
1934	76.66	1. Matti Järvinen	2. Matti Sippola 69.97
1936	71.84	2. Yrjö Nikkanen 70.77	3. Kalervo Toivonen 70.72
1938	76.87	1. Matti Järvinen	2. Yrjö Nikkanen 75.00
1946	68.74	2. Yrjö Nikkanen 67.50	Tapio Rautavaara 66.40
1948	69.77	1. Tapio Rautavaara	4. Pauli Vesterinen 65.89
1950	71.26	1. Toivo Hyytiäinen	5. Tapio Rautavaara 66.20
1952	73.78	3. Toivo Hyytiäinen 71.89	8. Soini Nikkinen 68.80
1954	76.35	3. Soini Nikkinen 73.38	
1956	85.71 wr		
1958	80.18	5. Väinö Kuisma 74.90	
1960	84.64	4. Väinö Kuisma 78.40	
1962	82.04	10. Väinö Kuisma 73.32	
1964	82.66	1. Pauli Nevala	6. Jorma Kinnunen 76.94
1966	84.84	4. Pauli Nevala 80.36	
1968	90.10	2. Jorma Kinnunen 88.58	
1969	91.52	2. Pauli Nevala 89.58	7. Usko Kuutti 77.84
1971	90.68	4. Hannu Siitonen 83.84	5. Jorma Kinnunen 80.96
1972	90.48	4. Hannu Siitonen 84.32	6. Jorma Kinnunen 82.06
1974	89.50	1. Hannu Siitonen	9. Aimo Aho 79.38
1976	94.58 wr	2. Hannu Siitonen 87.92	7. Seppo Hovinen 84.26
1978	89.12		
1980	91.20	5. Antero Puranen 85.12	6. Pentti Sinerssari 84.34
1982	91.34	5. Arto Härkönen 86.76	7. Antero Toivonen 84.34
1983	89.48		
1984	86.76	1. Arto Härkönen	
1986	84.76	4. Jyrki Blom 80.48	