

LONG TERM SPEED ENDURANCE DEVELOPMENT OF HUNGARIAN TOP SPRINTERS

Sándor BÉRES

Szeged Tudományegyetem - Juhász Gyula Pedagógusképző Főiskolai Kar Testnevelés és Sporttudományi Intézet

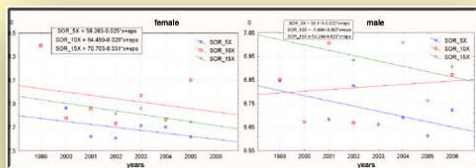
Abstract: We intend to find the answer in our study, how the level of special endurance of top sprinters varies as a result of the interval training applied during the years to improve their speed endurance. Does it improve significantly or not? Furthermore, if it is possible to set up a typical individual fatigue pattern relying on time curves. We accomplished our survey in nine years with a Hungarian top female and a male sprinter. During the trainings the athletes did their 60 and 100 metres runs with well-defined repetitions (5, 10 and 15 times), starting every 2:30 minutes. The intervals were reduced by the running time that is the breaks were less than 2:30 minutes every time, depending on the length of the runs. According to our hypothesis the index of the special endurance level will improve as a consequence of years long training. Moreover, the fatigue of the subjects will show individual characteristics influenced by the subject's psychological attitude, momentary fitness and mood. We assume that the mean velocity values will decrease with the rising repetition numbers and the fatigue curves will show significant deviations at each subject. We also examined the similarities in the execution of training at both sexes.

Keywords: interval training, speed endurance development, sprint, performance profile

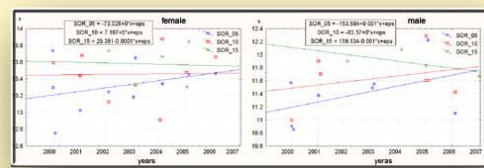
Procedure:

Subjects: One female Hungarian sprinter age 18, weight: 52kg, height 1,63m at the start of testing period. One male Hungarian sprinter age 25, weight: 74kg, height: 1,82m at the start of testing period. The female's personal bests are: 100m: 12,5s, and 200m: 25,s, the male's personal bests are: 100m: 10,63s; 200m: 21,70s.

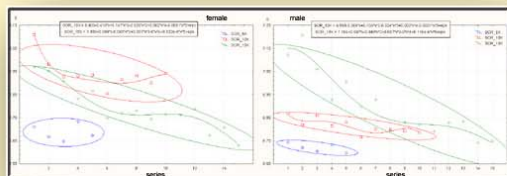
Protocol: Long term (9 years) training work. 60m, 100m sprints with the aim to reach the highest average velocity with 5x, 10x, and 15x repetitions, starting with 2:30 minutes.



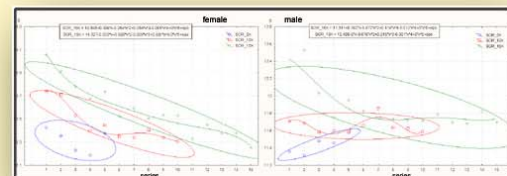
1. Fig. The mean results and trend lines of the 60m surveys at years 1999-2006 (first figure belong to the female, second belong to the male competitor, s)



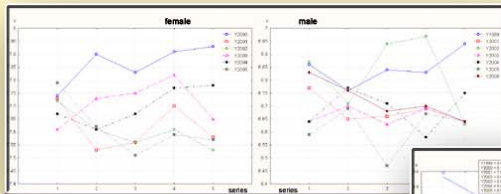
2. Fig. The mean results and trend lines of the 100m surveys at years 1999-2007 (first figure belong to the female, second belong to the male competitor, s)



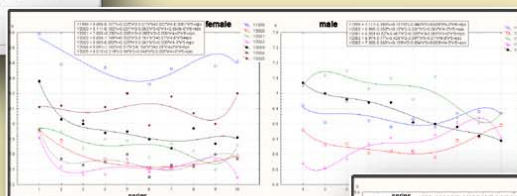
3 Fig. The mean results of the 60m runs with polinom approach 5, 10 and 15 repetition of the 100m surveys at years 1999-2007 (first figure belong to the female, second belong to the male competitor, s)



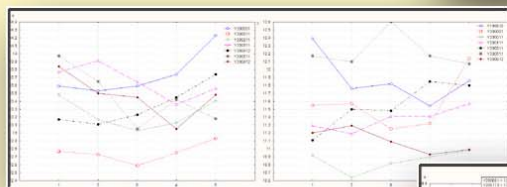
4. Fig The mean results of the 100m runs with polinom approach 5, 10 and 15 repetition of the 100m surveys in the period of 1999 to 2007 (first figure belong to the female, second belong to the male competitor, s).



5. Fig. The 5x60m mean results of the female and male competitors in the period of 2000 to 2005 (first figure belong to the female, second belong to the male competitor, s).

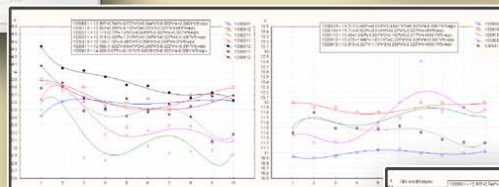


6. Fig. The 10x60m mean results of the female and male competitors in the period of 2002 to 2005 (first figure belong to the female, second belong to the male competitor, s)

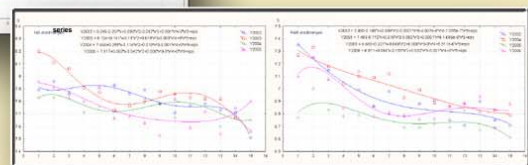


8. Fig. The 5x100m mean results of the female and male competitors in the period of 1999 to 2006 (first figure belong to the woman, second belong to the man competitor, s).

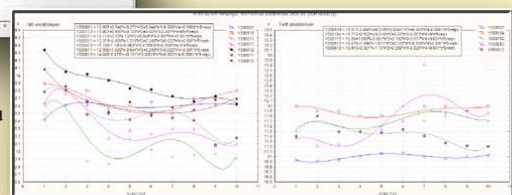
100m



7. Fig. The 15x60m mean results of the female and male competitors in the period of 2002 to 2006 (first figure belong to the female, second belong to the male competitor, s).



9. Fig. The 10x100m mean results of the female and male competitors in the period of 2000 to 2006 (first figure belong to the female, second belong to the male competitor, s).



10. Fig. The 15x100m mean results of the female and male competitors in the period of 2002 to 2007 (first figure belong to the female, second belong to the male competitor, s).

Conclusion:

- The level of special endurance did not show obvious improvement as the result of many years of training. The female and male competitors showed development in 60m run performance (with the exception of the male subject's 10x60m run exercise), which brought along significant advance in speed endurance parameters. Only the male athlete showed significant advance in the case in 100m run in 15x100m exercise.
- We found that the warm up time was not necessarily enough in the case of both competitors, because the athletes achieved worse results during the first runs in each and every case than in the later repetitions.
- Comparing the yearly data of the types of training with one sample t-probe, the runs of the female athlete were differing less from each other that is the characteristics of her runs were more uniform in similar types of exercises. The male and female competitors performed with similar characteristics mostly during the exercises with 5 time repetitions. The trainings run with 10 time repetitions showed the strongest differences in both distances.
- The fatigue of the subjects showed individual characteristics only partly. The chronological curves of the 15x60m and 15x100m runs of both the male and female competitors showed strong similarities (male: $r=0,8914$, $p<0,001$; female: $r=0,9477$, $p<0,001$). However, the series of runs with lower number of repetitions did not show significant relationship.
- The mode of execution of the 10x60m, 15x60m and 15x100m runs of the different sexes were similar to each other (15x60m: $p<0,001$; 10x60m: $p<0,02$; 15x100m: $p<0,01$) though that shows the similarity of the training adaptation of the different sexes and not the individual characteristics.

• Dupont G, Akajago K, Berthoin S. (2004) The effect of in-season, high-intensity interval training in soccer players, *Journal Of Strength And Conditioning Research* 18 (3): 584-589 aug 2004.
 • Bács Erzsébet (1997) A terheléses viaságatának elemzése, *Atletika*, 41. évfolyam, 2. sz. 22-26.
 • Lehman F. (2002) Az állóképességet nagy a gyorsaságot helyre-állítóképes felismerés, *Atletika*, 46. évfolyam, 1.sz. 15.-18.
 • Nádori L. (1986) Az edzés elmélete és módszertana, Budapest, Sport Kiadó, 115-116
 • Zakariás G. (2007) Az intervall edzésről, <http://www.fut.lap.hu/objekt.64e8277-9f36-4719-8649-3160ef56b3b.htm>; Dudas, Sportiroda