Predisposition of outdoor activities realization

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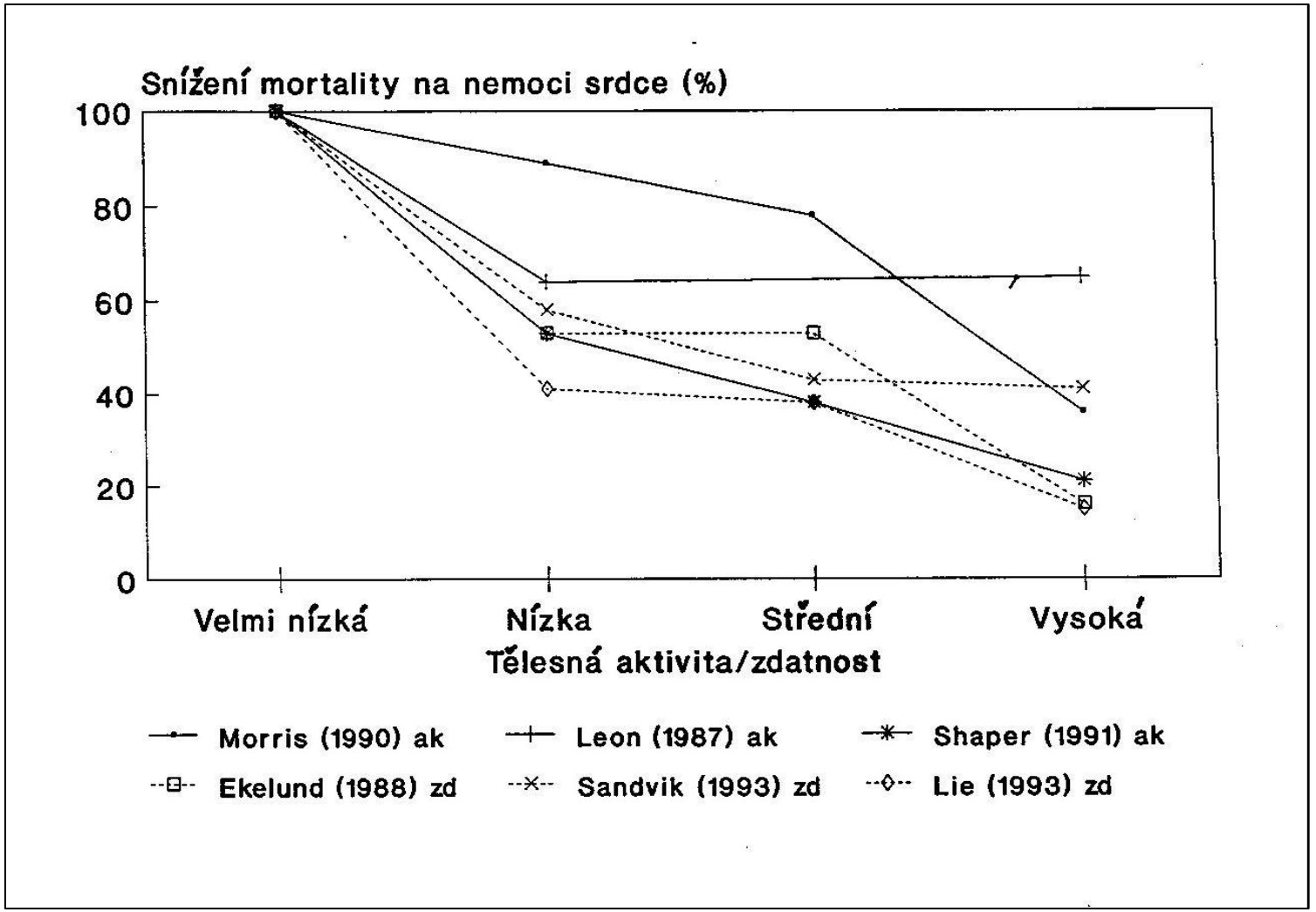
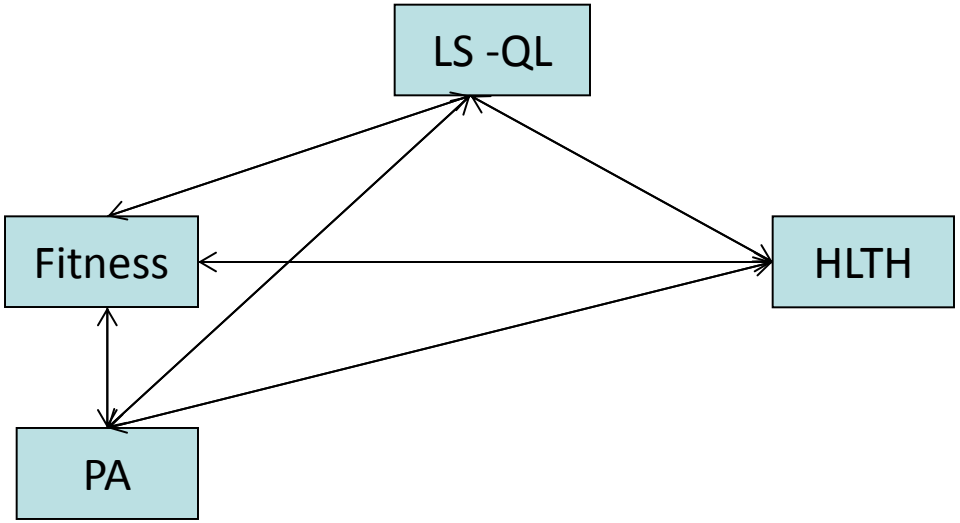
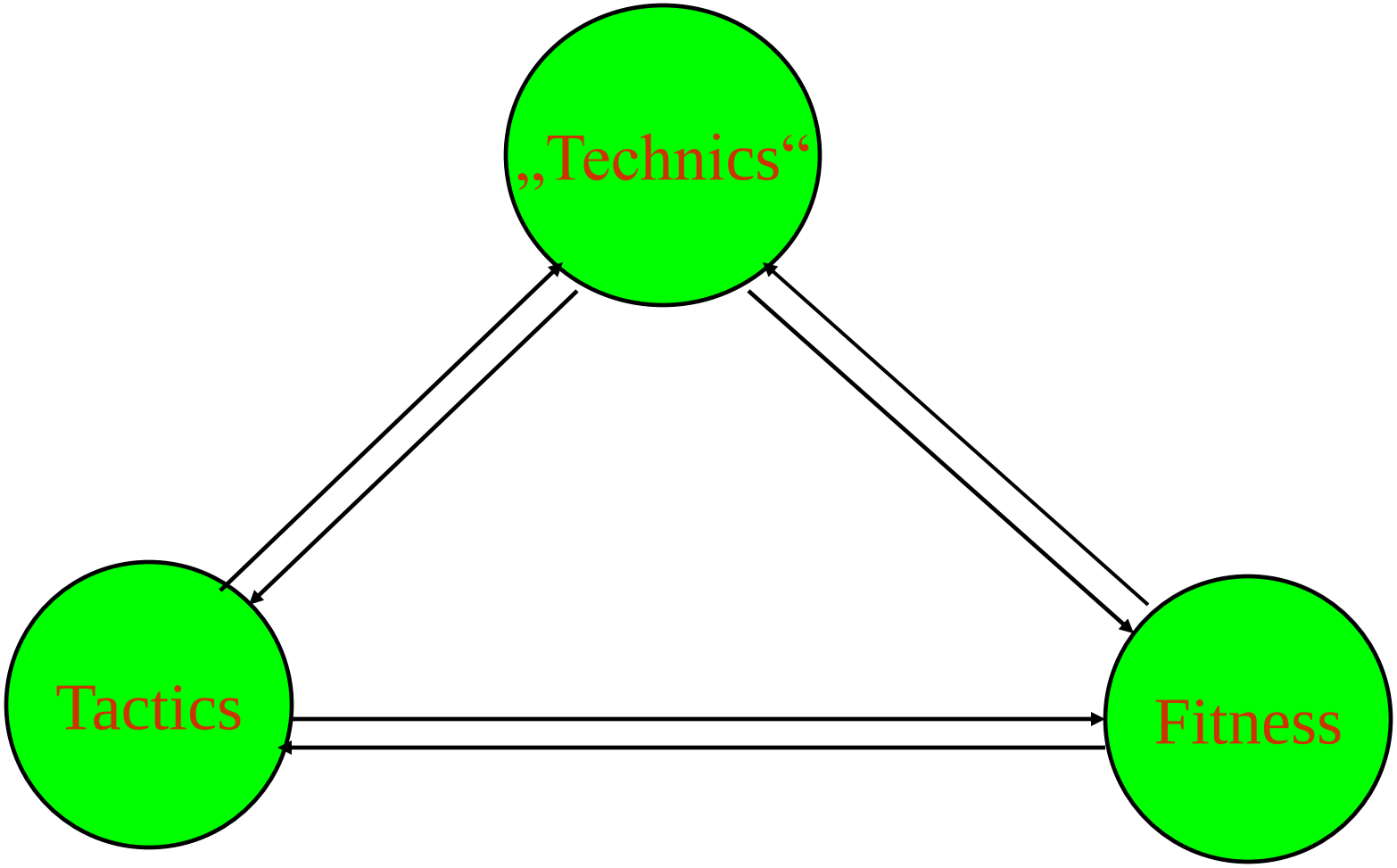
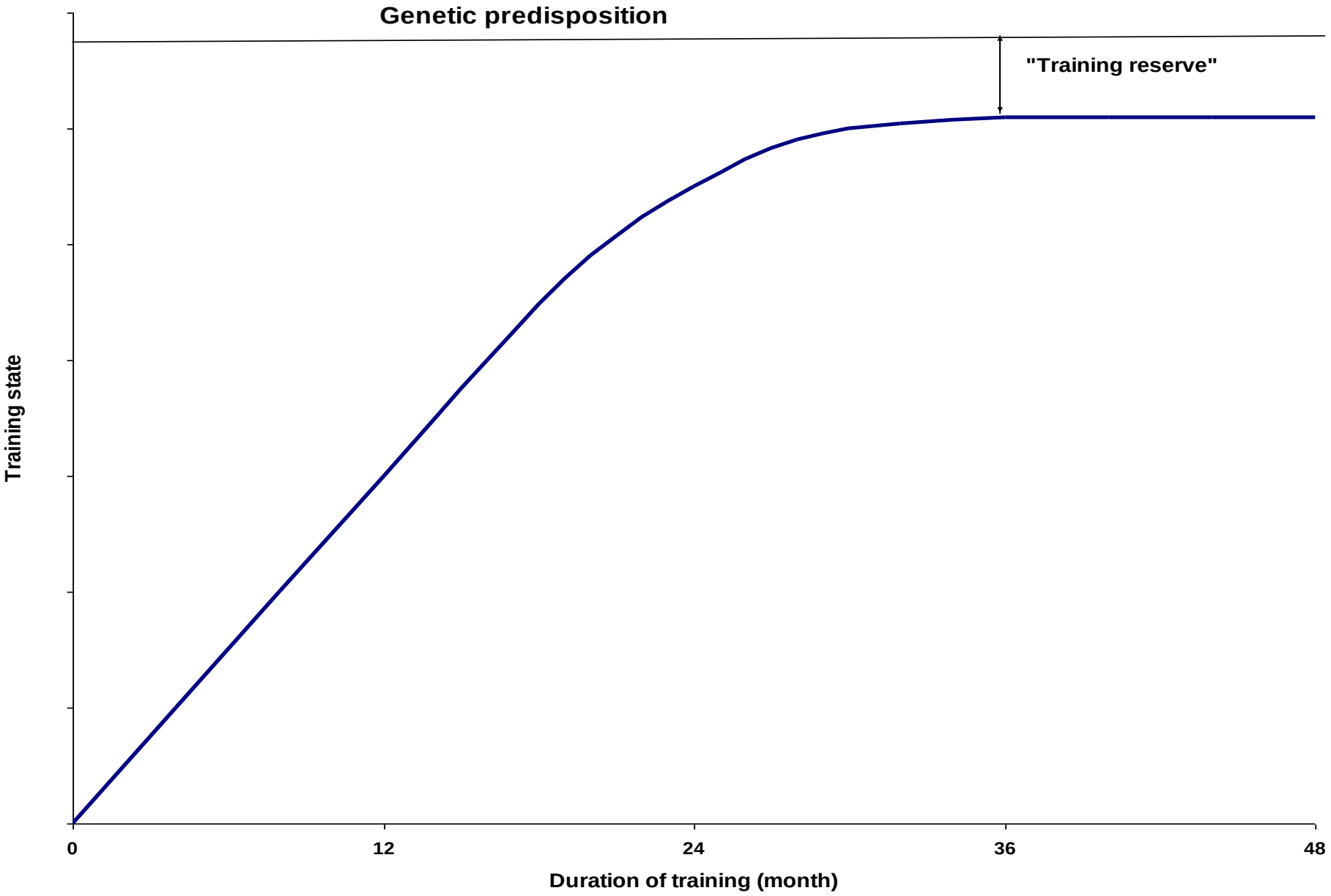
Health is not merely the absence of disease, but also the ability to implement leisure and work activities.

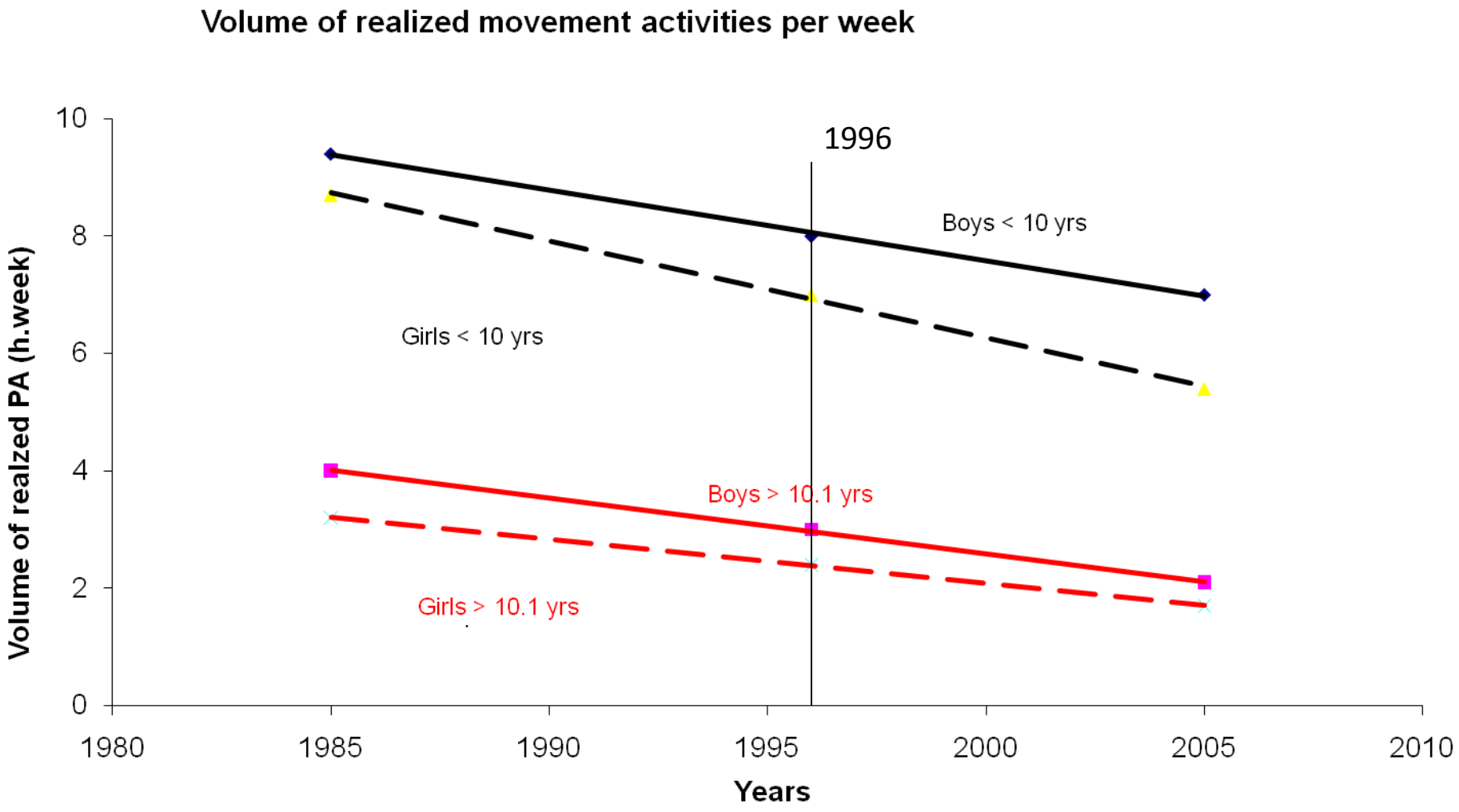
Influence of physical activity level on primary and secondary prevention of heart diseases (Morris, 1994)

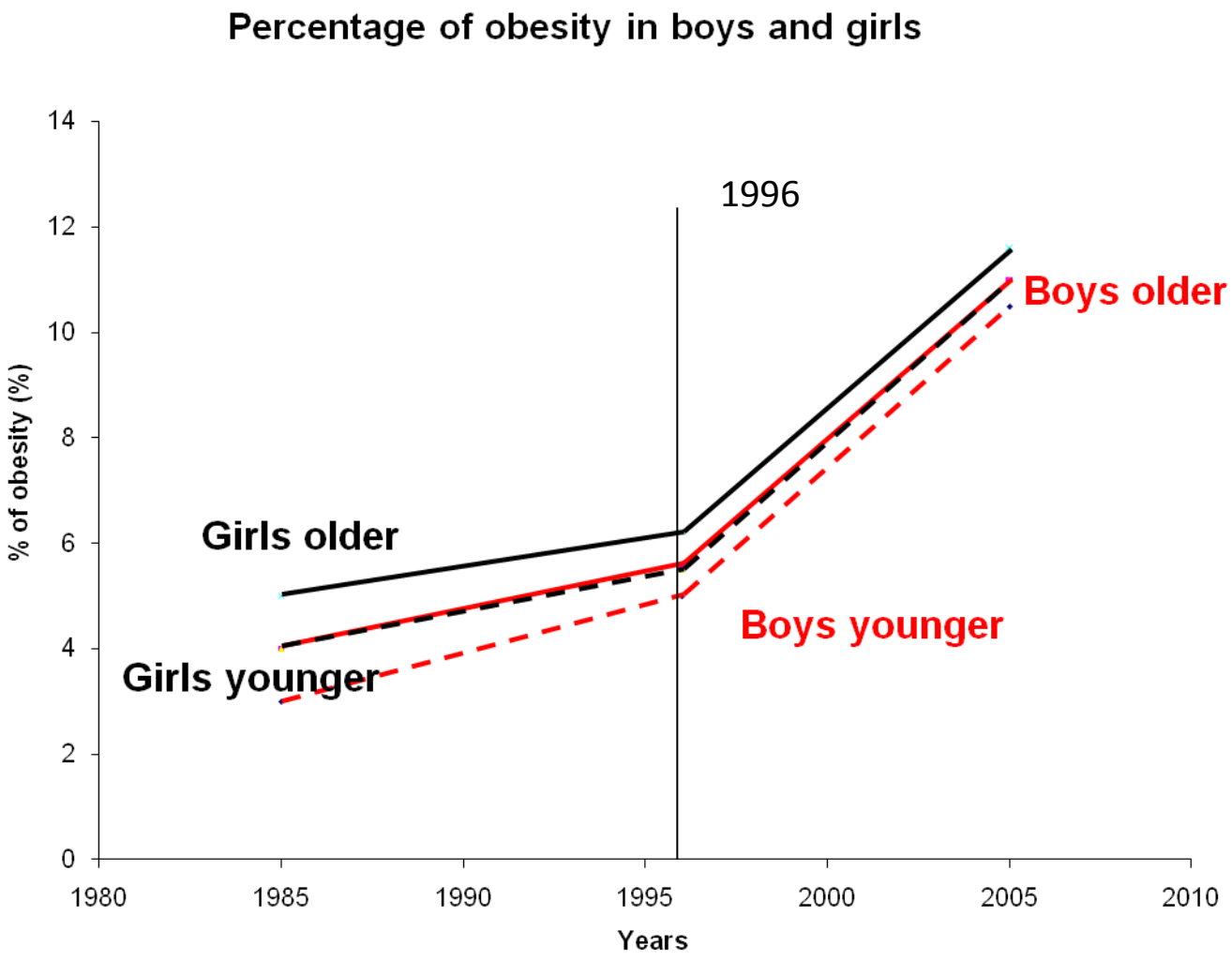


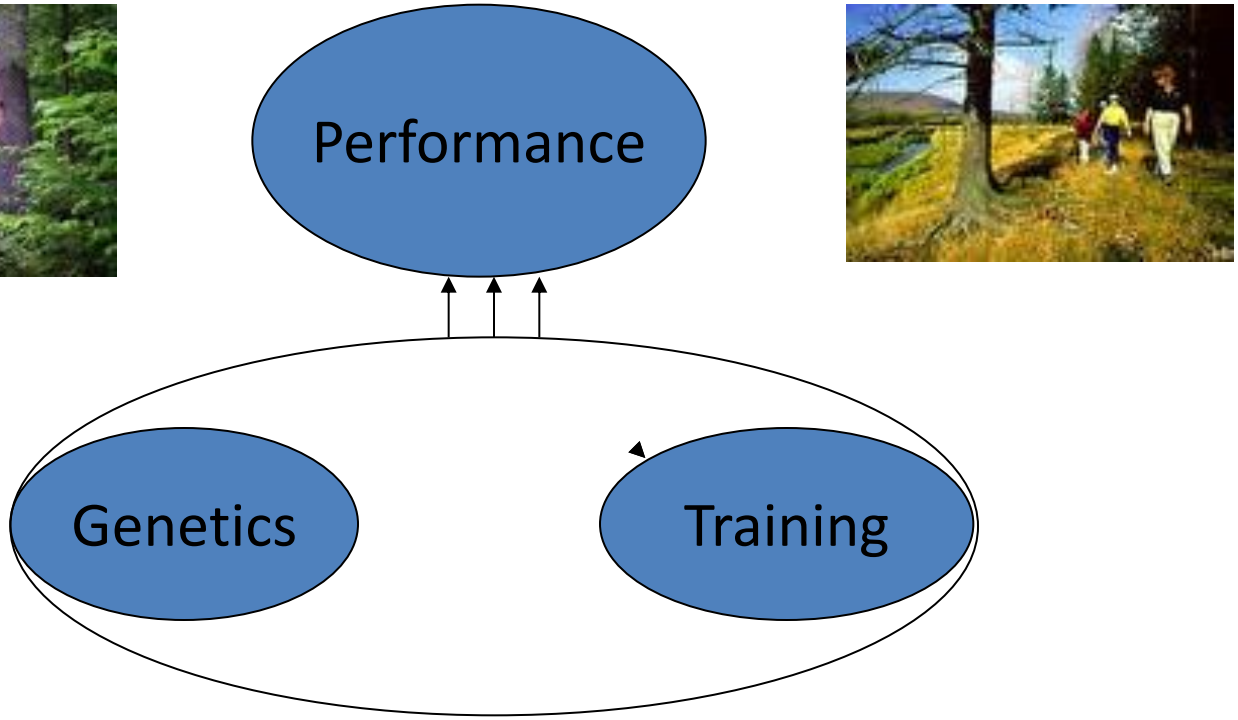

LS -QL
Fitness
HLTH
PA


„Technics“
Tactics
Fitness


Genetic predisposition
"Training reserve"
Training state
0
12
24
36
48
Duration of training (month)


Volume of realized movement activities per week
Volume of realzed PA (h.week)
10
8
6
4
2
0
1996
Boys < 10 yrs
Girls < 10 yrs
Boys > 10.1 yrs
Girls > 10.1 yrs
1980
1985
1990
1995
2000
2005
2010
Years

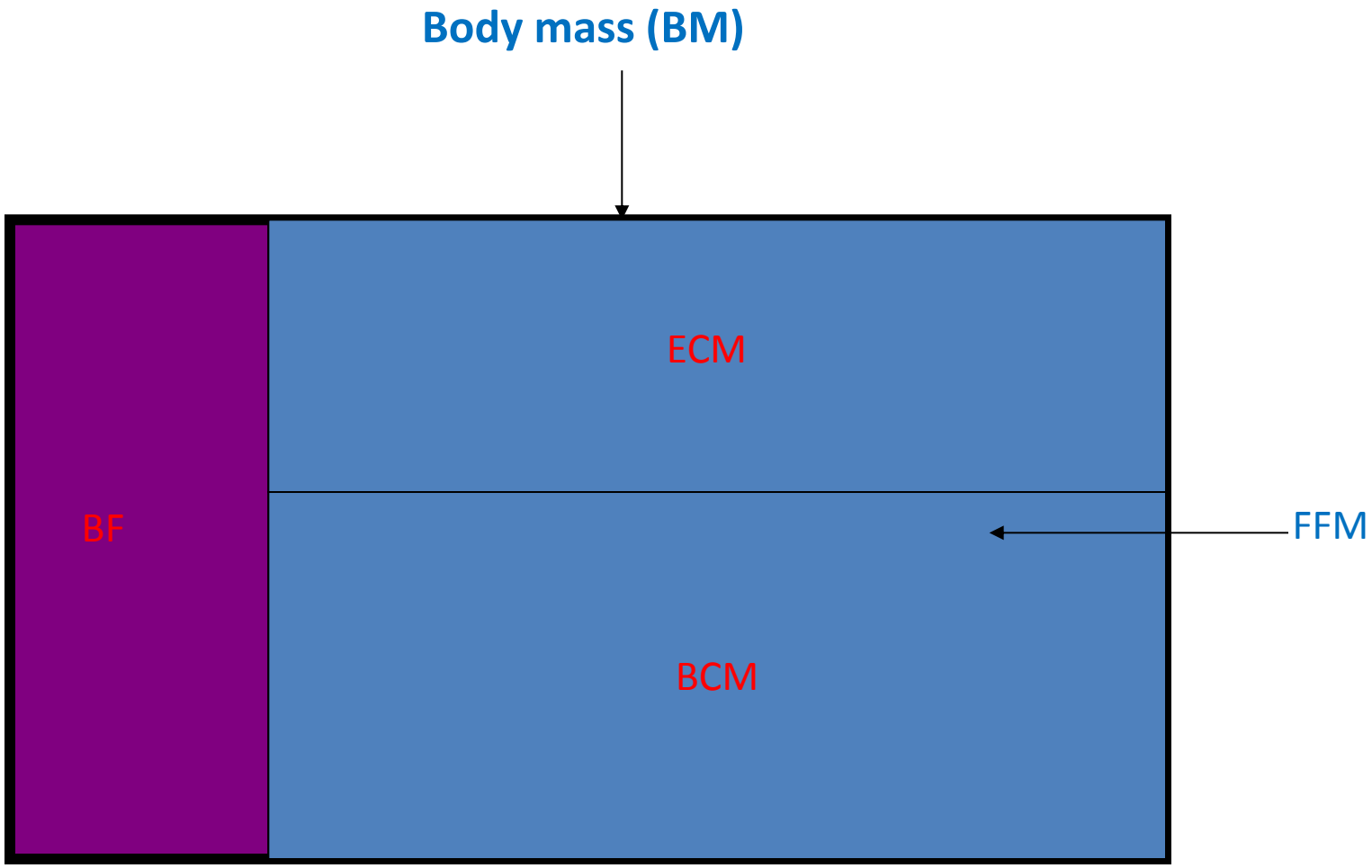

Percentage of obesity in boys and girls
14
12
10
8
6
4
2
0
% of obesity (%)
1996
Boys older
Girls older
Boys younger
Girls younger
1980
1985
1990
1995
2000
2005
2010
Years


Performance
Genetics
Training

- In the majority of physical activities we transfer the body mass.
- For this transfer we need the energy that is stored in body.
- The differences in stored energy between subjects are non significant.

- For the real physical activity and the subject is therefore always necessary to determine an appropriate body weight.

- One possible option is to assess the body composition.



BM = FFM + BF

FFM = BCM + ECM

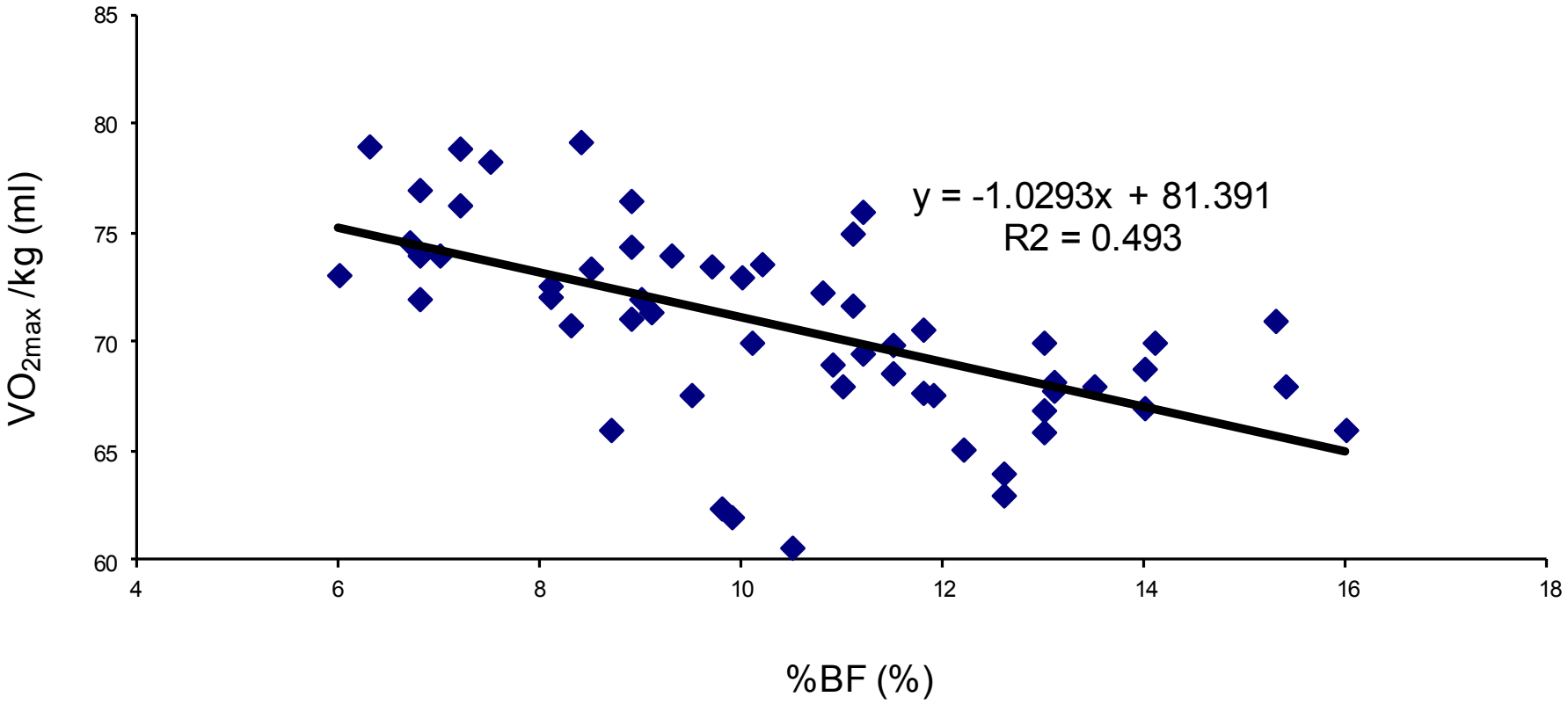
Mean values of %BF in different groups of athletes

	Men (%)	Women (%)
Endurance runners	6-9	8-12
Cross country skiing	7-11	9-12
Biathlon	8-10	10-12
Soccers	8-12	11-15
Tennis	10-13	12-15
Ice hockey	12-16	14-18
Swimmers	12-16	16-20
Non-trained	10-16	16-22

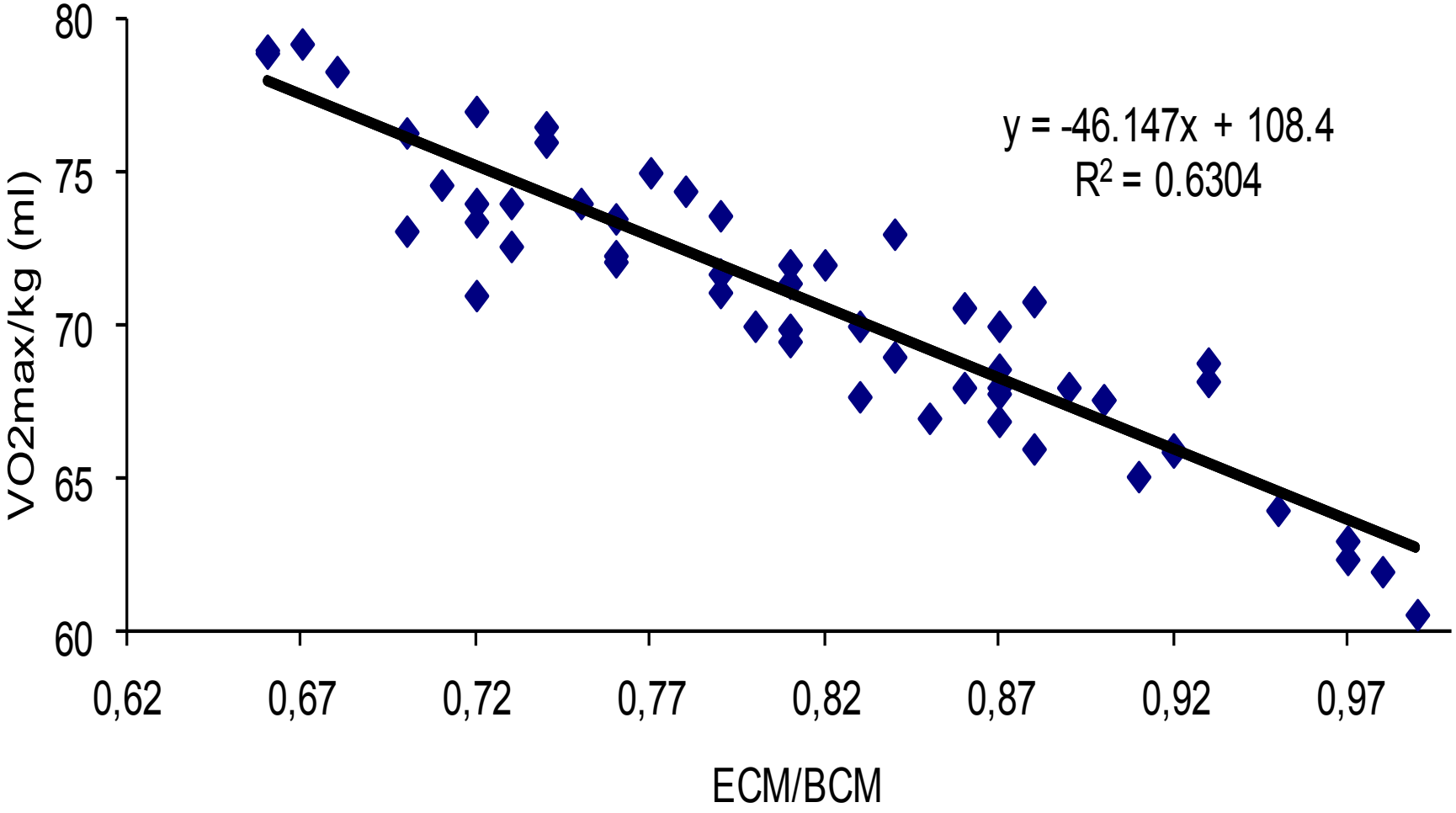
Mean values of ECM/BCM in different groups of top athletes

	Men	Women
Ice hockey	0.58	0.69
Sprint	0.62	0.67
Soccer	0.64	0.70
Cross country skiing	0.67	0.70
Biathlon	0.68	0.71
Tennis	0.70	0.74
Endurance runners	0.71	0.75
Swimmers	0.72	0.76

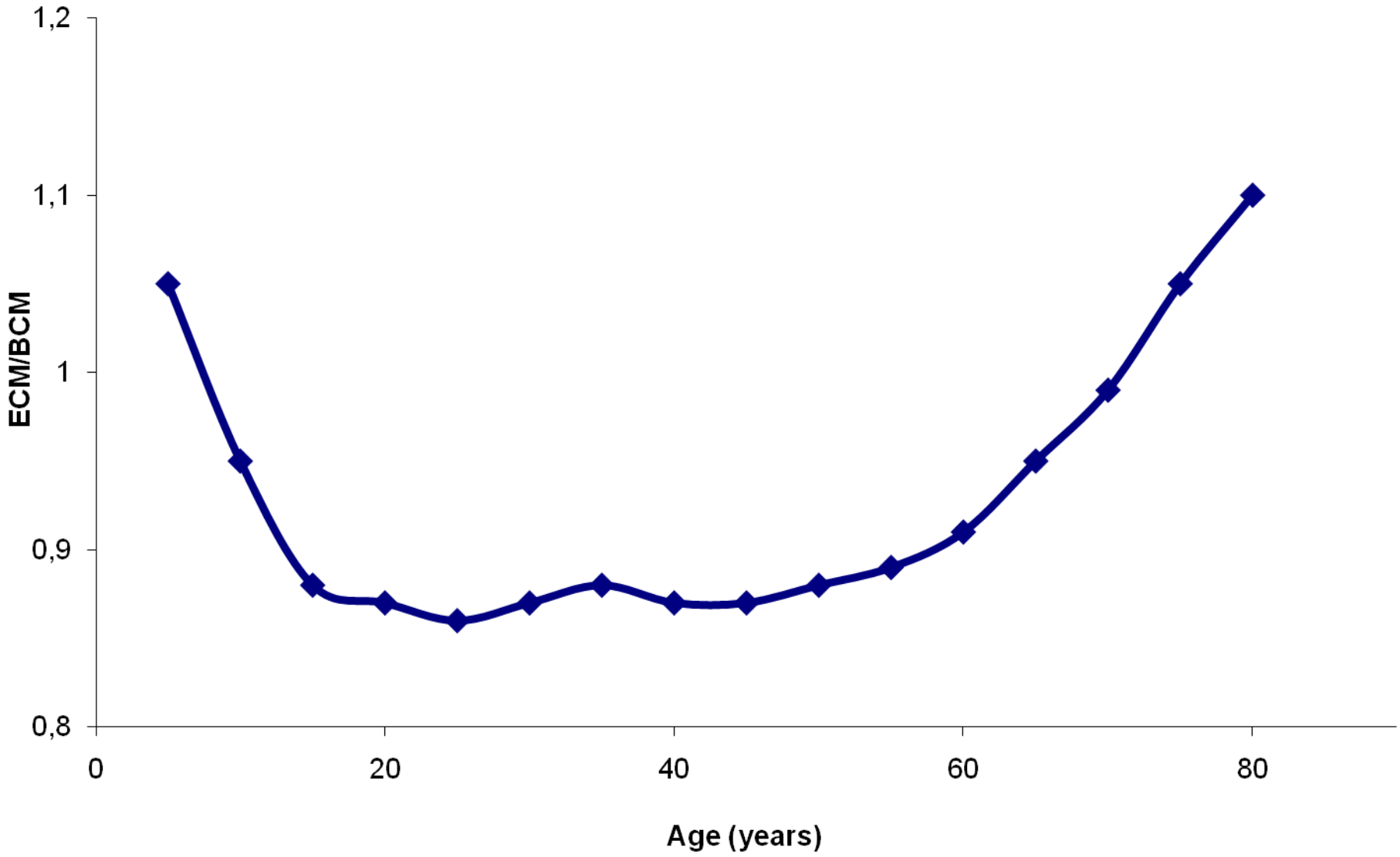
Dependence of VO_{2max}/kg on %BF

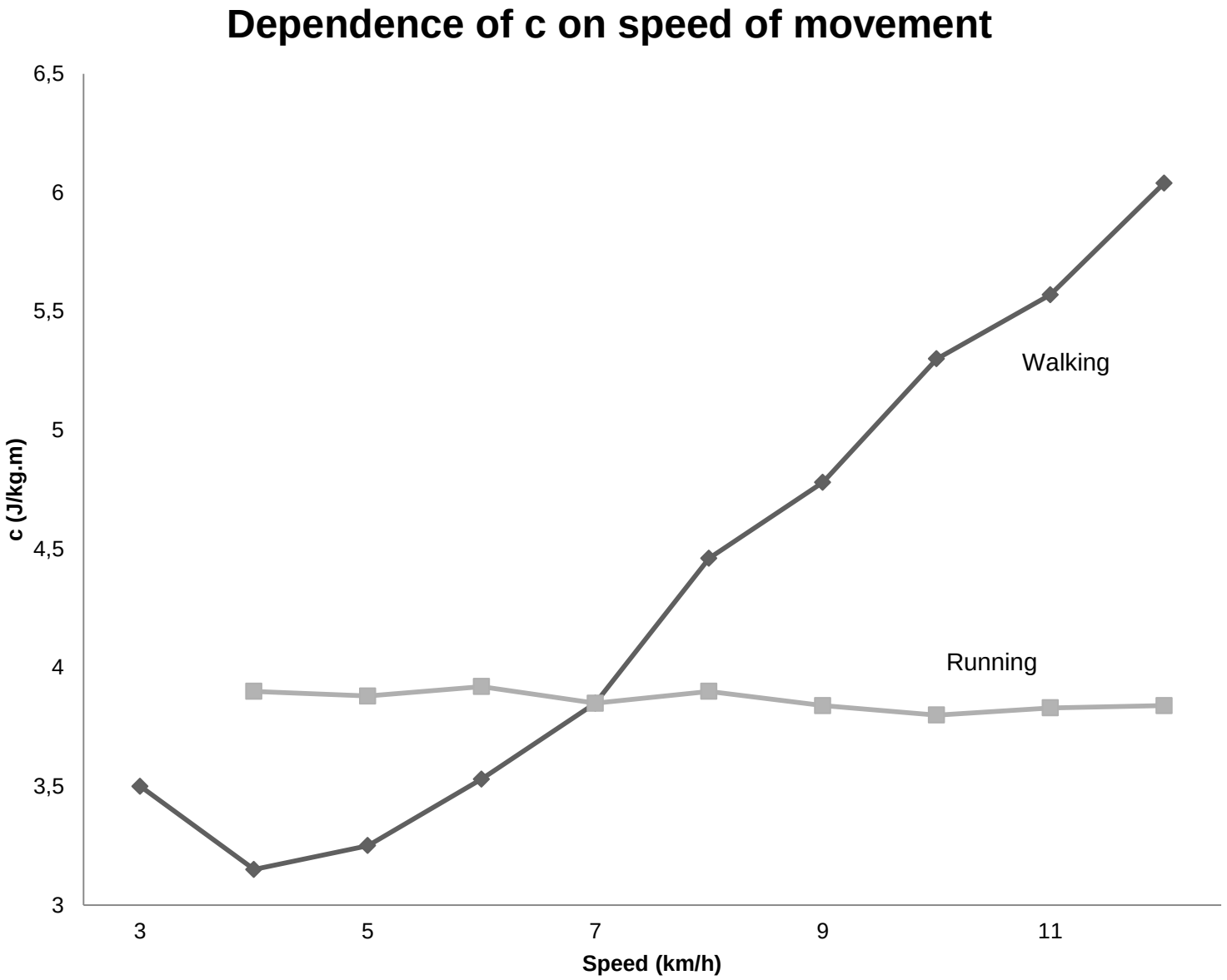


Dependence of VO_{2max}/kg on ECM/BCM



Dependence of the relationship ECM/BCM on age




Dependence of c on speed of movement
6,5
6
5,5
5
4,5
4
3,5
3
c (J/kg.m)
3
5
7
9
11
Speed (km/h)
Walking
Running

Children

	Before	After
v_{max} (km/h) (N)	12.5±1.8	13.9±1.7*
v_{max} (%)	100	111.2±4.2**
VO_{2max}/kg (ml)	44.6±3.9	51.2±3.0**
VO_{2max}/kg (%)	100	114.8±3.6**
v_{max} (km/h) (OV)	11.8±1.1	12.8±0.9*
v_{max} (%)	100	108.5±0.9*
VO_{2max}/kg (ml)	33.1±5.3	38.7±4.8**
VO_{2max}/kg (%)	100	116.9±1.5**
v_{max} (km/h) (OB)	9.8±0.3	10.4±0.4*
v_{max} (%)	100	106.1±2.2*
VO_{2max}/kg (ml)	24.5±3.2	27.7±3.3**
VO_{2max}/kg (%)	100	113.1±3.6**

* p<0.05, ** p<0.01, N – normal body mass, OV – overweight, OB – obesity