

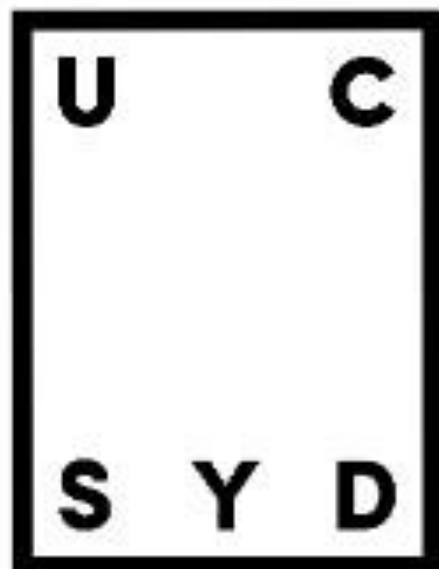


S·H·E

Schools for Health in Europe



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SHE Academy ***4-6. November, 2020*** ***PA and learning***

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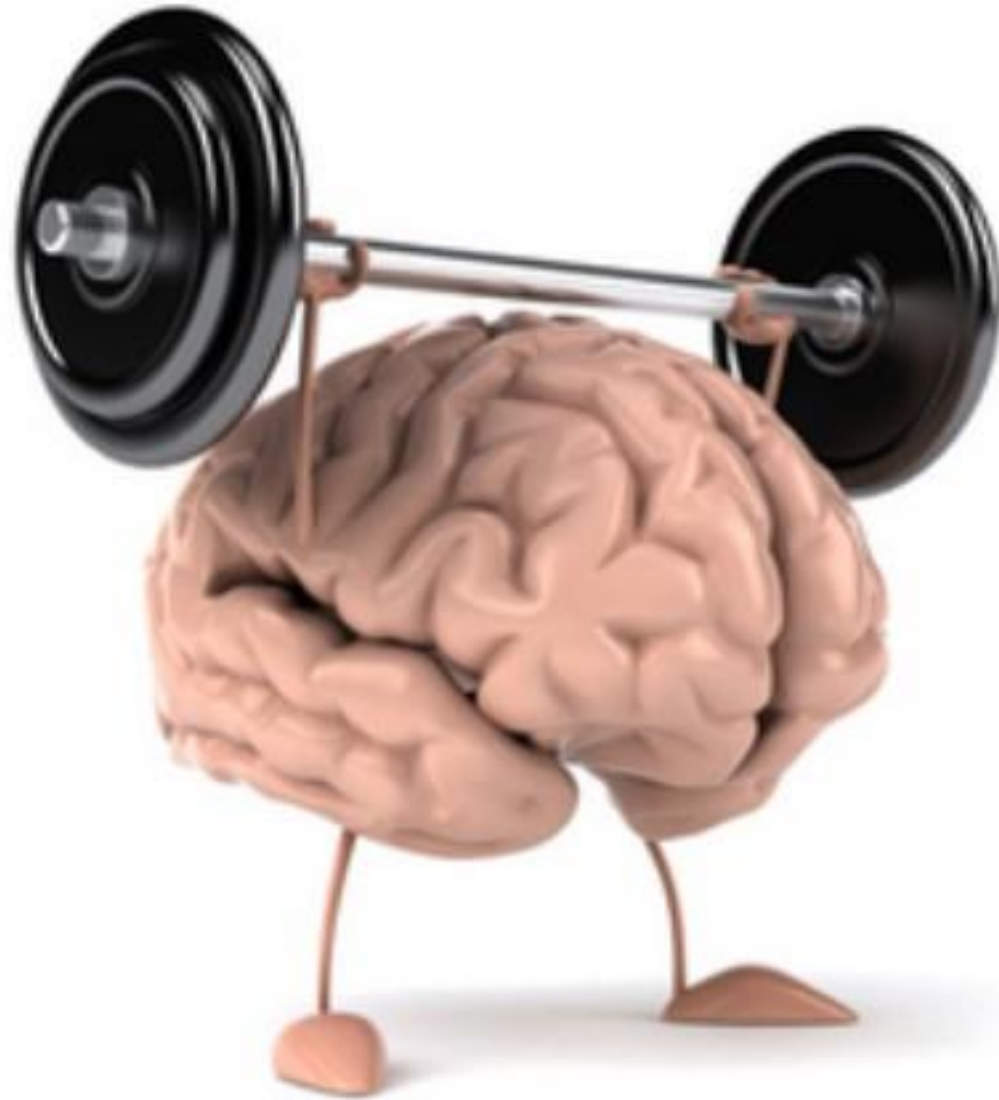
Oxygen uptake
Exact measurement of PA
Different types of PA

AND

Learning
Cognition
Academic performance
6 Memory
Executiv functions

Math test
Memory test
Intelligence test
Flanker test (Cognitive test - EF)
Well-being test (national test)

PA and Learning



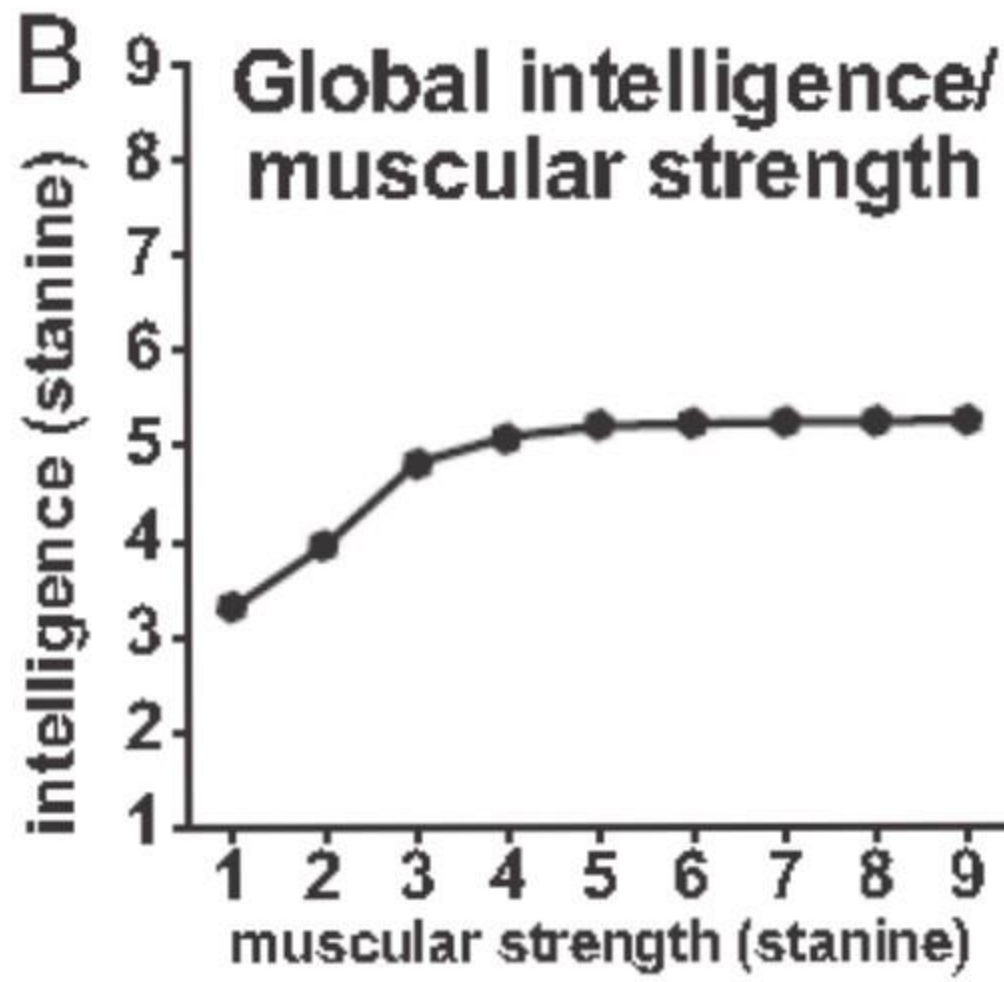
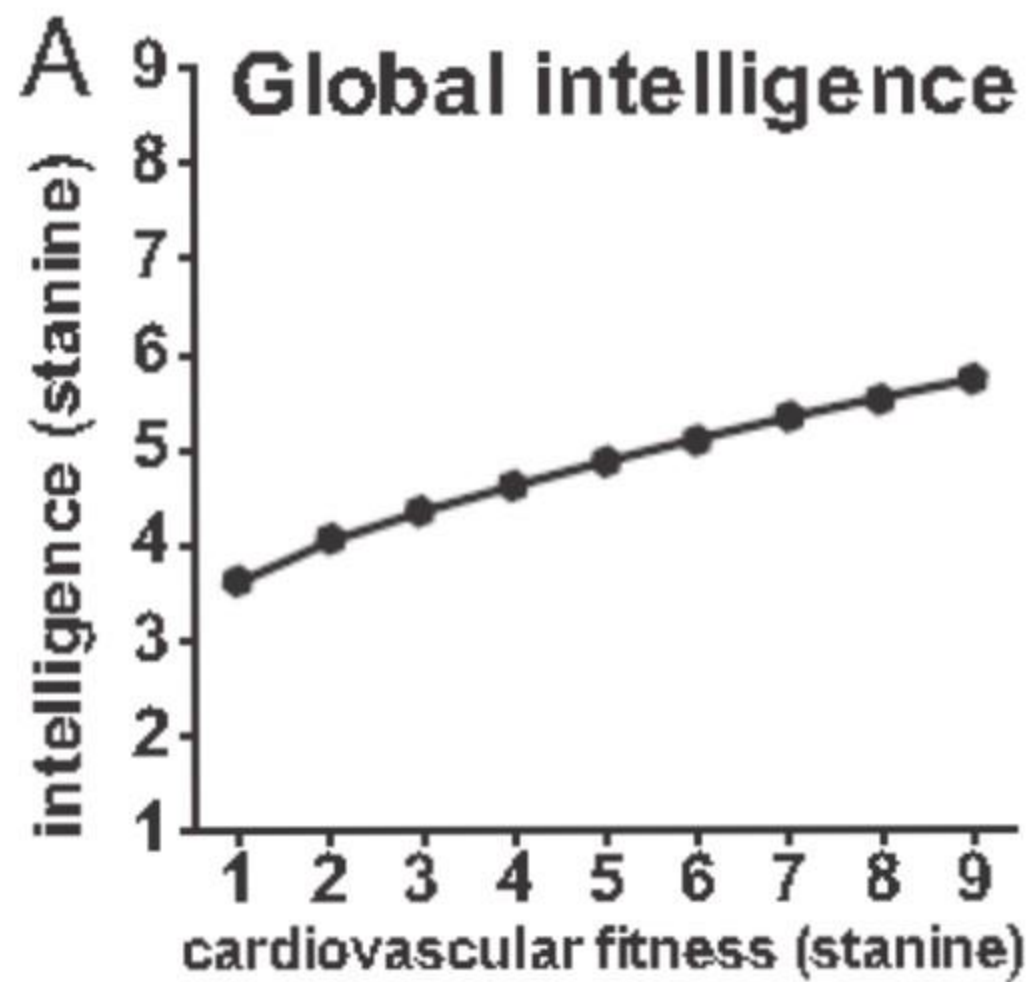
First meta-analysis ([Sibley & Etnier, 2003](#)).

- 44 studies
- small, but statistically significant, correlation between physical activity and cognition
- No causality is detected and no explanation mechanisms

Focus on executive functions ([Tompsonowski et al., 2007](#), [Fedewa et al, 2011](#), [Verburgh et al 2014](#))

- Improvements in children's mental functions due to movement are most evident in executive functions
- Both acute and long term effect on the EF of physical activity / exercise

The interest from researchers and education professionals in the potential for classroom-based PA to positively impact academic-related outcomes has increased over the last years ([Watson, 2017](#)).



- 1) Active breaks
- 2) Physical training
- 3) PA integrated into the academic lessons
- 4) PE
- 5) Free play / breaks
- 6) Active transport.

1. Active breaks:

- Some studies - all positive or no difference
- often focus on increased concentration / readiness to learn

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3. PA integrated into the academic lessons

- Well documented positive effect (Norris, 2015)

PE

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- Many studies with 1-6 extra PE lessons or in-service training of teachers
- Positive or no effect on academic performance
- Many multimodal interventions

Free play

16 There is a correlation between the number of play options in the schoolyard and objectively measured physical activity.

Nielsen G, Bugge A, Hermansen B et al (2012)

Walking for transport

Relative risk = 0.89 (0.83-0.96)

14 studies, 280,000 individuals and 2.6 million person years

Mean age = 56; Mean follow-up 10.1 years

Exposure = 11.25 MET.hrs per week

Risk of all-cause mortality reduced by 11% in the group that walks



(Lundbye et al., 2017)

- 77 children aged 10-11
- Movement after a learning effort helped to increase the so-called consolidation
- 20 minutes PA vs. sitting quietly
- The difference was approx. 10% after one week
- The effect of running and ball games was similar.

Why it works:

Children (9-10 years of age) in good shape performed better than their peers in poor shape (measured by oxygen uptake) on memory tests and these children have a 12% greater hippocampus

19 Increased plasticity - new brain cells

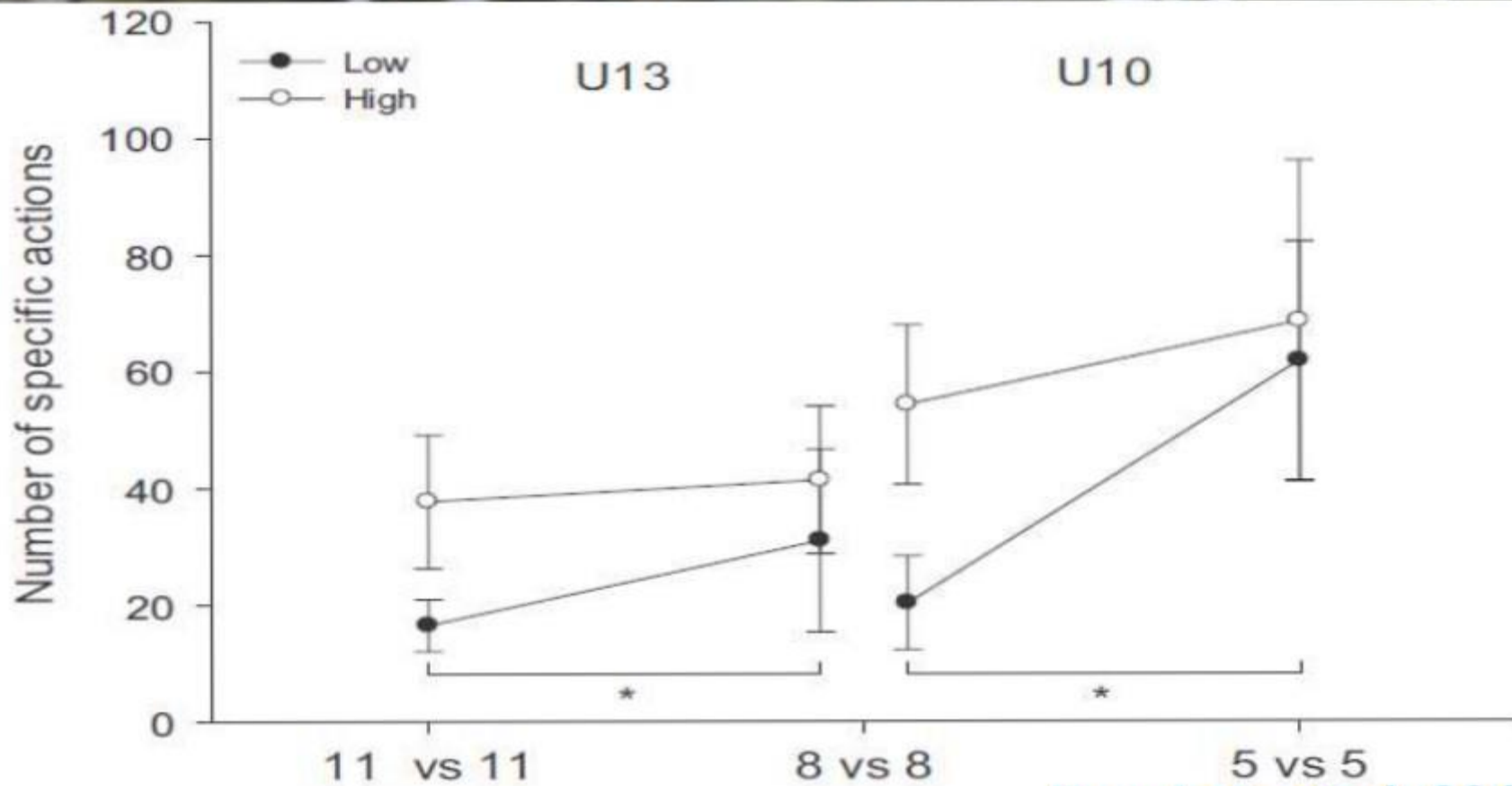
BDNF - protects brain cells, forms new ones, plays an important role in e.g. depression, skitsophrenia.
The intensity is important for BDNF

blood flow, neurotransmitters, hormones

The rich get richer



Involvement during U10 and U13 games



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Randers et al. 2014

Thank you
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