

Work visit Loughborough (UK)

Presented by Jérôme Gijsselaers

Authors: Jérôme Gijsselaers, Daniel Bingham, Yu-Ling Chin, Stephan Bandelow, Natalie Pearson, Lorraine Cale, Keith Tolfrey, Mike Fray, Charlotte Edwardson, Rosemary McEachan, Gerry Richardson, Renate de Groot, Sally Barber & Stacy Clemes

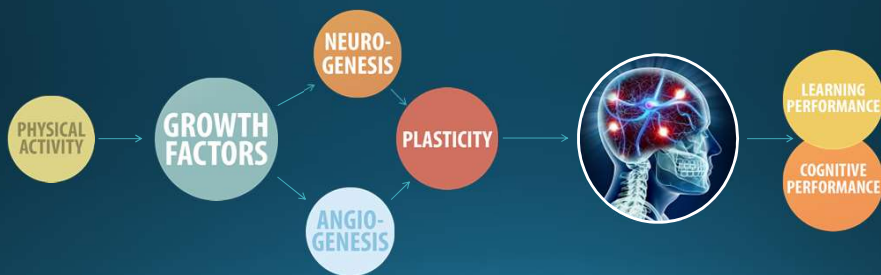
The effects of a long-term standing desk intervention on school performance, classroom behaviour, and cognitive performance in primary education

Results of the Stand Out in Class Study

Problem definition



Theory - mechanisms



Barenberg, Berse & Dutke, 2011

Theory - sedentary behaviour & health



Duvivier et al., 2013; 2017

Hinckson et al., 2016

Carson et al., 2016

Tremblay et al., 2011

Theory - Effects of interventions



Sherry et al., 2016

Hinckson et al., 2016

Minges et al., 2016

Research question

What are the effects of a standing desk intervention on school performance, classroom behaviour, and cognitive performance in primary school children?

Method

- Design
- Participants
- Procedures
- Materials
- Analysis



Clemes et al., 2016

Results

- Sample description

| | Sex | | | Age in years (SD) | Age range in years |
|--------------------|------|--------|-------|-------------------|--------------------|
| | Male | Female | Total | | |
| Control group | 50 | 40 | 90 | 9.81 (0.32) | 9.07-10.91 |
| Intervention group | 49 | 37 | 86 | 9.78 (0.29) | 9.26-10.23 |
| Total | 99 | 77 | 176 | 9.80 (0.30) | 9.07-10.91 |

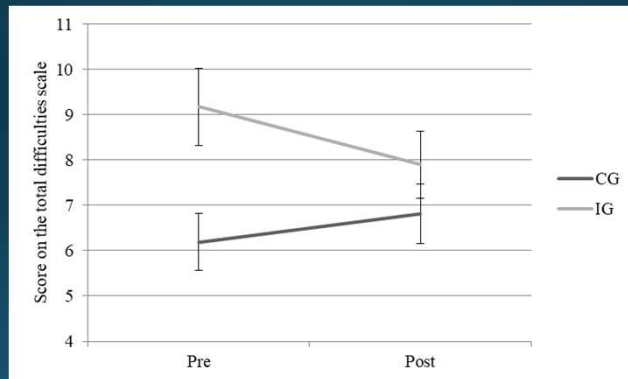
Results – school performance

| Change in school performance for Maths, Reading, and Writing. | | | | | | | | | |
|---|-------------|------------|-----------|---------------|------------|-----------|---------------|------------|-----------|
| | Maths (n/%) | | | Reading (n/%) | | | Writing (n/%) | | |
| | Decreased | No-change | Increased | Decreased | No-change | Increased | Decreased | No-change | Increased |
| Control (n=90) | 4 (4.4) | 80 (88.9) | 6 (6.7) | 16 (17.7) | 66 (73.3) | 8 (8.9) | 10 (11.1) | 73 (81.1) | 7 (7.8) |
| Intervention (n=84) | 3 (3.6) | 70 (83.3) | 11 (13.1) | 4 (4.8) | 66 (78.6) | 14 (16.7) | 4 (4.8) | 73 (86.9) | 7 (8.3) |
| Total | 7 (4.0) | 150 (86.2) | 17 (9.8) | 20 (11.5) | 132 (75.9) | 22 (12.6) | 14 (8.0) | 146 (83.9) | 14 (8.0) |

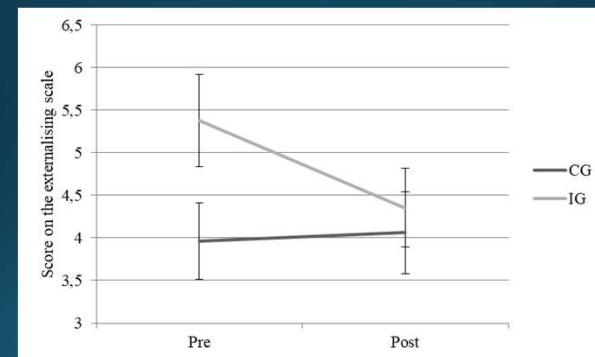
Results – classroom behaviour

| Outcome measure | Group | Mean (SD) Pre | Mean (SD) Post | Mean Difference (95% CI) | Time: p-value (np ²) | Group: p-value (np ²) | Time X Group: p-value (np ²) |
|--------------------------------|-------|---------------|----------------|--------------------------|----------------------------------|-----------------------------------|--|
| Total difficulties score (1-4) | CG | 6.39 (5.72) | 6.81 (5.98) | 0.61 (-0.36; 1.59) | .343 | .035 | .007 |
| | IG | 9.18 (7.58) | 7.90 (6.60) | -1.28 (-2.27; -0.29) | (.006) | (.027) | (.044) |
| Externalising behaviour (1,2) | CG | 3.96 (4.09) | 4.06 (4.38) | 0.10 (-0.57; 0.76) | .040 | .188 | .013 |
| | IG | 5.38 (4.82) | 4.35 (4.09) | -1.03 (-1.61; -0.44) | (.026) | (.011) | (.038) |
| Internalising behaviour (3,4) | CG | 2.33 (2.76) | 2.75 (3.35) | 0.52 (-0.05; 1.09) | .529 | .020 | .068 |
| | IG | 3.80 (4.01) | 3.54 (3.66) | -0.25 (-0.87; 0.36) | (.002) | (.033) | (.021) |
| 1. Conduct problems | CG | 0.69 (1.28) | 1.05 (1.79) | 0.36 (0.02; 0.72) | .700 | .460 | .001 |
| | IG | 1.27 (1.99) | 0.81 (1.49) | -0.46 (-0.79; -0.12) | (.001) | (.003) | (.065) |
| 2. Hyperactivity | CG | 3.18 (3.19) | 3.01 (2.94) | -0.27 (-0.74; 0.21) | .013 | .138 | .360 |
| | IG | 4.11 (3.22) | 3.54 (3.09) | -0.57 (-1.02; -0.12) | (.038) | (.014) | (.005) |
| 3. Peer problems | CG | 1.29 (1.54) | 1.40 (1.62) | 0.11 (-0.20; 0.42) | .762 | .195 | .210 |
| | IG | 1.76 (1.99) | 1.58 (1.85) | -0.17 (-0.50; 0.15) | (.001) | (.010) | (.010) |
| 4. Emotional symptoms | CG | 0.94 (1.66) | 1.35 (2.22) | 0.41 (0.00; 0.82) | .260 | .007 | .102 |
| | IG | 2.04 (2.51) | 1.96 (2.35) | -0.08 (-0.50; 0.35) | (.008) | (.045) | (.017) |
| 5. Prosocial behaviour | CG | 7.39 (2.81) | 7.12 (2.58) | -0.27 (-0.73; 0.20) | .657 | .155 | .035 |
| | IG | 7.57 (2.57) | 7.97 (2.04) | 0.41 (-0.02; 0.82) | (.001) | (.013) | (.028) |

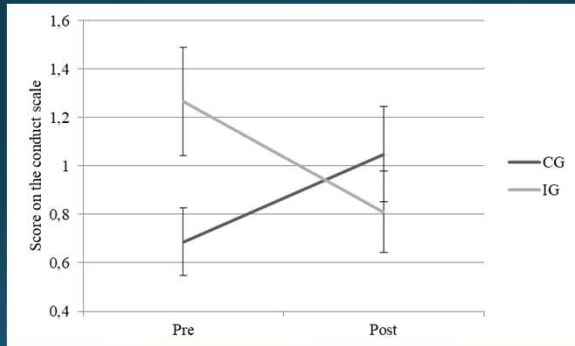
Results – classroom behaviour



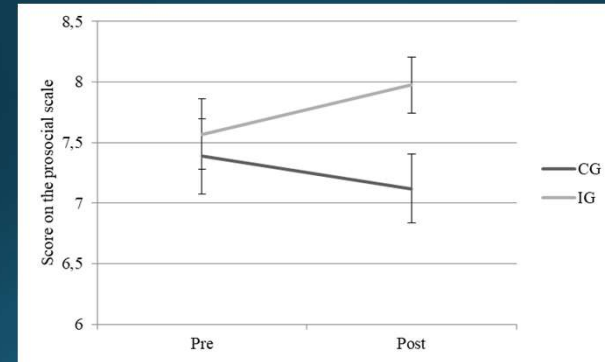
Results – classroom behaviour



Results – classroom behaviour



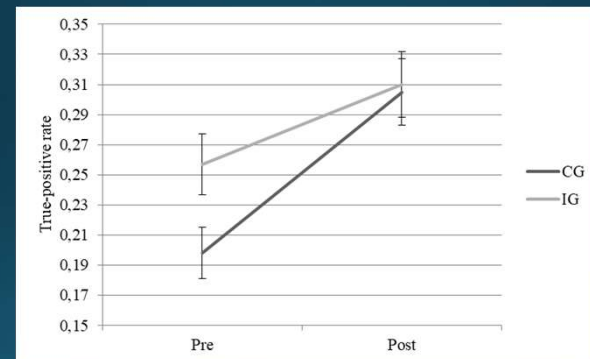
Results – classroom behaviour



Results – cognitive performance

| Test | Outcome measure | Group | Mean (SD) Pre | Mean (SD) Post | Mean Difference (95% CI) | Time: p-value (np ²) | Group: p-value (np ²) | Time X Group: p-value (np ²) |
|------------------------------|-----------------------|-------|---------------|----------------|--------------------------|----------------------------------|-----------------------------------|--|
| Stroop test | Simple (ms) | CG | 1260 (390) | 1204 (325) | -.56 (-146; 34) | .014 | .959 | .338 |
| | | IG | 1293 (530) | 1166 (256) | -.127 (-243; -10) | (.037) | (.000) | (.006) |
| | Complex (ms) | CG | 1727 (503) | 1520 (435) | -.207 (-328; -87) | <.001 | .565 | .220 |
| | | IG | 1715 (435) | 1600 (378) | -.115 (-202; -30) | (.107) | (.002) | (.010) |
| Corsi-block tapping test | Mean sequence length | CG | 4.22 (1.11) | 4.49 (1.08) | 0.27 (0.02; 0.52) | <.001 | .761 | .837 |
| | | IG | 4.16 (0.97) | 4.46 (1.14) | 0.31 (0.08; 0.53) | (.072) | (.001) | (.000) |
| Rapid visual processing test | Accuracy (range 0-1) | CG | -.198 (-.153) | -.305 (-.204) | -.107 (-.070; -.144) | <.001 | .217 | .041 |
| | | IG | -.257 (-.170) | -.310 (-.193) | -.053 (-.015; .090) | (.189) | (.010) | (.026) |
| | Alertness (range 0-1) | CG | -.541 (-.214) | -.592 (-.269) | -.051 (-.001; .101) | .017 | .744 | .494 |
| | | IG | -.560 (-.166) | -.588 (-.148) | -.029 (-.013; .070) | (.036) | (.001) | (.003) |
| | Reaction time (ms) | CG | 649 (142) | 654 (123) | 5.69 (-32.3; 43.5) | .984 | 1.000 | .643 |
| | | IG | 655 (122) | 648 (94.0) | -6.21 (-40.0; 27.7) | (.000) | (.000) | (.001) |

Results – cognitive performance



Discussion & conclusions



With gratitude

- A big thanks to:
 - Van der Gaag Grant of the Royal Netherlands Academy of Arts and Sciences
 - Renate
 - University of Loughborough
- The co-authors:
 - Yoyo
 - Natalie
 - Stephan
 - Daniel
 - Renate
 - Stacy

