**SUPPLEMENTAL DIGITAL CONTENT**

**Table S1.** Selected studies supporting the association of executive function and social cognition in healthy individuals and peers with a psychiatric or neurological disorder.

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| **Author, year** | **Sample** | **Measures** | **Outcomes** |
| Gyurak et al. 2012 (1) | N = 21 healthy older adults  N = 48 older adults with a neurological disorder | Affective film  Forward/ Backward Digit Span  Stroop task  Trail Making task  Verbal fluency | Cognitive flexibility ↔ Emotion regulation (both groups) |
| Lantrip et al. 2016 (2) | N = 70 healthy adolescents | Emotion Regulation Questionnaire for Youth  Behavior Rating Inventory of Executive Function-Self-Report | Executive function ↔ Emotion regulation |
| Bradford et al. 2015 (3) | N = 62 healthy young and middle-aged adults | False-belief task  Stroop task | Inhibitory control ↔ Theory of mind |
| Wang et al. 2016 (4) | N = 255 healthy children | Backward Digit Span  Trail Making task  Arrows Task  Smiling Faces task Triangles Task  Silent Film task  Strange Stories task | Executive function ↔ Theory of mind |
| Groves et al. 2021 (5) | N = 102 children with ADHD  N = 28 healthy children | Emotion Regulation Checklist Letter Updating Task  Rapport Visuospatial Reordering  Counting Span  Stop Signal task  Go/NoGo task  Shifting tasks | Working memory ↔ Emotion regulation (both groups) |
| David et al. 2014 (6) | N = 110 adults with depression  N = 96 healthy adults | Emotion Hexagon Test  Wisconsin Card Sorting Test | Cognitive flexibility ↔ Emotion recognition (both groups) |

*Notes:* Positive associations between outcomes are indicated by ↔

**Table S2.** Selected experimental studies showing acute and long-term benefits of exercise on executive function.

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| **Author, year** | **Sample** | **Exposure** | **Measures** | **Outcomes** |
| **Acute effects** | | | | |
| Brush et al. 2016 (7) | N = 28 healthy adults | I1: 20 min RES, LI  I2: 20 min RES, MI  I3: 20 min RES, HI  C: passive | Stroop task  Simon task  Plus-Minus task  N-Back task | Pre vs post:  (-) Reaction time in I3 vs I1, I2 and C (Stroop task)  (0) Accuracy in I3 vs I1, I2 and C (Stroop task) |
| Drollette et al. 2012 (8) | N = 36 healthy children | I: 20 min END, MI  C: passive | N-Back task  Flanker task | Post:  (+) Accuracy in I vs C (Flanker task)  (0) Reaction time in I vs C (Flanker task) |
| Kamijo et al. 2009 (9) | N = 12 healthy young adults  N = 12 healthy older adults | I1: 20 min END, LI  I2: 20 min END, MI  C: passive | Flanker task | Post:  (-) Reaction time in I1 vs C (both groups)  (-) Reaction time in I2 vs I1 and C (both groups)  (0) Accuracy in I1 and I2 vs C (both groups) |
| Ludyga et al. 2017(10) | N = 18 healthy adolescents  N = 16 adolescents with ADHD | I1: 20 min END, MI  I2: 20 min COR, MI  C: active | Flanker task | Pre vs post:  (-) Reaction time in I1 and I2 vs C (both groups)  (0) Accuracy in I1 and I2 vs C (both groups) |
| **Long-term effects** | | | | |
| Hillman et al. 2014 (11) | N = 221 healthy children | I: MIX 5 x 120 min/w, MI  C: Active | Modified Flanker Task  Color-shape Switch Task | Pre vs post:  (+) Accuracy in I vs C (both tasks)  (0) Reaction time in I vs C (both tasks) |
| Koutsandréou et al. 2016 (12) | N = 71 healthy children | I1: END 3 x 45 min/w, MI  I2: COR 3 x 45 min/w, MI  C: Active | Letter Digit Span | Pre vs post:  (+) Accuracy in I1 vs C  (+) Accuracy in I2 vs I2 and C |
| Ludyga et al. 2018 (13) | N = 35 healthy adolescents | I: MIX 5 x 20 min/w, MI  C: passive | Stroop Color-Word | Pre vs post:  (-) Reaction time in I vs C  (0) Accuracy in I1 vs C |
| Best et al. 2015 (14) | N = 155 older adults | I1: RES 1 x 60 min/w, HI  I2: RES 2 x 60 min/w, HI  C: Active | Stroop Color-Word  Trail Making Test  Backward Digit Span  Digit Symbol Substitution Test | Pre vs post:  (+) Executive function (latent construct) in I1  (0) Executive function (latent construct) in I2 and C |
| Stern et al. 2019 (15) | N = 132 healthy adults | I: END 4 x 45 min/w, VI  C: Active | Set Switching  Grotton Maze Learning | Pre vs post:  (+) Executive function (latent construct) in I1 vs C |

*Notes:* For outcomes the direction of effects are indicated by (-) = Decrease or inverse association, (0) = No change, and (+) = Increase; C = Control group or condition; COR = coordinative exercise; END = endurance exercise; HI = high intensity; I = Intervention group or condition; LI = low intensity; MI = moderate intensity; MIX = mixed exercise; RES = resistance exercise; UI = unspecific intensity; VI = vigorous intensity

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