Training Parameters with Dual N-Back Task Affect the Outcome of the Attentional Network Task in ADHD Patients

Masashi Dotare, Yoshiyuki Asai, Sarah K. Mesrobian, Michel Bader, Alessandro E. P. Villa, and Alessandra Lintas

Abstract Patients affected by attention-deficit/hyperactivity disorder (ADHD) are characterized by impaired executive functioning and/or attentional deficits. Our study is aimed to determine whether the outcomes measured by the attentional network task (ANT), i.e., the reaction times (RT) to specific target and cueing conditions and alerting, orienting, and conflict effects, are affected by cognitive training with a dual N-Back task. We considered three groups of young adult participants: ADHD patients without medication, ADHD with medication (MADHD), and age/education-matched controls (CTL). Working memory training began the day after the pretest. Participants were asked to perform 20 trainings composed of 20 blocks during an entire month. They were told that they would have to practice the dual N-Back task for about 30 min per day during the week and to rest for two days in the weekend. Each experimental group was randomly assigned into two conditions, the first with a progressive level (PL) of difficulty training, while the second was blocked at the

M. Dotare (✉)
School of Medicine, Yamaguchi University, 1-1-1 Minami-kogushi, Ube, Yamaguchi, Japan
e-mail: i907eb@yamaguchi-u.ac.jp

Y. Asai
Department of Systems Bioinformatics, Graduate School of Medicine, Yamaguchi University, 1-1-1 Minami-kogushi, Ube, Yamaguchi, Japan
e-mail: asai@yamaguchi-u.ac.jp

M. Bader
Research Unit of the University Department of Child and Adolescent Psychiatry (SUPEA), CHUV University Hospital, 1004 Lausanne, Switzerland
e-mail: bader_m@bluewin.ch

S. K. Mesrobian · A. E. P. Villa · A. Lintas
NeuroHeuristic Research Group, University of Lausanne, 1015 Lausanne, Switzerland
e-mail: smesrobian@neuristic.org

A. E. P. Villa
e-mail: alessandro.villa@unil.ch
URL: http://www.neuroheuristic.org

A. Lintas
e-mail: alessandra.lintas@unil.ch

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level 1 during the whole training phase (baseline training). We observed that PL training was beneficial with reduced RTs in all groups and reduced conflict effects. MADHD showed a positive effect already with baseline training, whereas ADHD showed no significant reduction of neither RTs nor conflict effect after baseline training. No group showed any effect of training on alerting and orienting effects.