1. Introduction

- Inhibitory control (IC), as described by Rothbart (1989), is the capacity to plan and to suppress inappropriate approach responses under instructions or in novel or uncertain situations.
- IC forms an integral part of Rothbart's model of temperament, which he defines as ‘constitutional differences in reactivity and self-regulation’. Reactivity refers to motor, emotional, and attentional responses to internal and external stimuli. Self-regulation are those processes serving to modulate this reactivity (e.g., Approach/Withdrawal, Inhibitory control, and Attention). Temperamental concepts are being used to explain emotional, behavioral and physiological patterns and responses that are evoked under conditions of stress (e.g., novelty situations, unfamiliar persons).
- Using the Children's Behavior Questionnaire (CBQ) (Rothbart, et al., 2001) differences in IC were found between CWS and CWNS (Eggers, et al., 2009 & 2010) (Figure 1).
- IC plays a significant role in determining how various mental processes work together in the successful performance of a task (Dowsett & Livesey, 1999) and is strongly related to the conscious use of attention (Kochanska, '97).

2. Aim of the study

- To examine whether previously found questionnaire-based differences on IC in CWS are also apparent in AWS, as measured by a direct, behavioral, neuropsychological computer task.

3. Participants

- 48 adults (42 men and 6 women); 24 AWS (mean age= 27.01; SD = 9.4) and 24 age (± 1Y) and gender-matched AWNS (mean age= 27.01; SD = 9.2); all native Dutch speakers, with no known/reported neurological, psychological, developmental problems, normal hearing (Wood, 2003), and normal or corrected to normal vision.
- Socio-economic status based on the educational level.
- Diagnosis AWS: min. 3 % WWD and/or MWR, and at least ‘mild’ on the SSI-3, based on a sample of min. 300W.

4. Procedure

- Participants were all paid volunteers, recruited after initial contact with their fluency specialist or self-help group (for the AWS). All tests were conducted in a quiet setting at the home of the participant during one or two visits by a trained student.
- Gonogo-task (De Sonneville, 2005): go-stimulus (50%): participants need to press the button as soon as possible, nogo-stimulus (50%): tendency to press must be inhibited. (signal duration: fixed, 800ms., valid response: 200-2300ms., events interval: fixed: 2800 ms.; 8 practice sessions & 48 trials) (Figure 2).

5. Results

- Independent-samples t-tests were employed to evaluate possible differences on chronological age, SES, IQ-score, and a simple reaction time task. No significant between-group differences were found (p > .05).
- Analysis of variance showed a significant difference between the two participant groups on the gonogo-task variable ‘false alarms’, i.e., the failure to inhibit pressing the response button to a nogo-signal (dependent variable). Participant group was the independent variable, F (1, 46) = 5, p < .05 (Figure 3).

6. Conclusions

- AWS, as a group, exhibited a less controlled response style, with more frequent reactions to nogo-signals. This finding is compliant with our earlier CBQ-based findings on IC in CWS.
- Classically, IC was assumed to be triggered by nogo-signals; recent studies however link the go-signal to the release of IC. Inhibition may act proactively during pre-stimulus period, ending with the arrival & identification of a go-signal. Several cortical areas play a modulating role in this proactive inhibition, with the major focus on the subthalamic nucleus (Ballanger, et al., 2009).
- (Low) IC could increase the amount of stress-related situations that PWS encounter. IC could also play a role in linguistic processing, moderating error-detection or error-processing (e.g., Vasic & Wijnen, 2006).
- Clinical considerations are premature since further research is still needed. This may provide additional information on spontaneous recovery and on treatment outcome.

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8. References