

ORIGINAL ARTICLE

AQT cognitive speed and processing efficiency differentiate adults with and without ADHD: A preliminary study

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Abstract

Objective. We evaluated the hypotheses that A Quick Test of Cognitive Speed (AQT) single- and dual-dimension naming speed measures would differentiate normal adults and adults with ADHD before medication and that there would be no differences between groups after stabilization with medication. **Methods.** Thirty adults with ADHD, aged 18–43, were evaluated with the AQT color (C), form (F) and color–form combination (CF) naming tests before and after medication with methylphenidate. Thirty age- and sex-matched normal adults served as controls. **Results.** Among adults with ADHD, pre-medication naming times (s) for C, F, and CF were significantly longer and overhead [CF – (C + F)] significantly larger than post-medication. Before medication, C, F and CF naming and processing efficiency (overhead) (s) differed significantly between ADHD adults and controls. After medication, there were no significant differences between groups. When we used fail criteria for dual-dimension naming (>60 s) and overhead (processing efficiency) (>+6 s) together the sensitivity was 93% and specificity 100%. **Conclusions.** Within the study limitations, findings suggest that the processing-speed and efficiency measures in AQT may be used to screen adults for executive dysfunction and reduced cognitive control associated with ADHD.

Key Words: Adults, attention deficit/hyperactivity disorders, AQT, processing speed, cognitive control, methylphenidate

Introduction

Attention deficits and executive function disorders are hallmarks of attention deficit hyperactivity disorders (ADHD) and persist from childhood to adulthood [1–3]. In psychiatric practice, the impact of ADHD on functional abilities is generally established qualitatively by using behavioral rating scales [4]. The impact of ADHD on attention and executive functions can be established quantitatively with broad-based or specific neuropsychological tests [5–11]. Processing-speed tests are commonly used to assess specific executive functions in ADHD. Of these, the Stroop Color–Word Test [6] evaluates inhibition, Conner’s Continuous Performance Test II [7,8] and the Integrated Visual and Auditory Continuous Performance Test [9,10] evaluate inhibition and sustained attention. The Trail Making Test [11] evaluates attentional abilities, including executive control and cognitive set shifting. However, most standardized processing speed tests do not allow for test–retest

within short time intervals and some require advanced technological support and interpretation is relatively complex [7–10].

A Quick Test of Cognitive Speed (AQT) [12,13] is a screening test, designed to assess single- and dual-dimension processing speed by using rapid, continuous, automatic naming tasks. Color–Form Naming features two single-dimension tests (color and form naming) and one dual-dimension test (color–form combination naming). Each test uses 40 visual stimuli and the results are reflected by timed naming speed in seconds. The single-dimension tests measure reaction + retrieval + response time. The dual-dimension test measures processing speed and overhead from increased demands on attention, working memory, and set shifting (switch cost). AQT Color–Form Naming has proven useful in assessing changes in cognitive function secondary to neurological and neuropsychiatric disorders [14–16]. Administration and scoring are quick and easy,