

THE EFFECT OF ENVIRONMENTAL DISTRACTORS INCORPORATION INTO A CPT ON SUSTAINED ATTENTION AND ADHD DIAGNOSIS AMONG ADOLESCENTS

Berger, I., & Cassuto, H. (2014). *Journal of Neuroscience Methods*, 222, 62-68.

SYNOPSIS

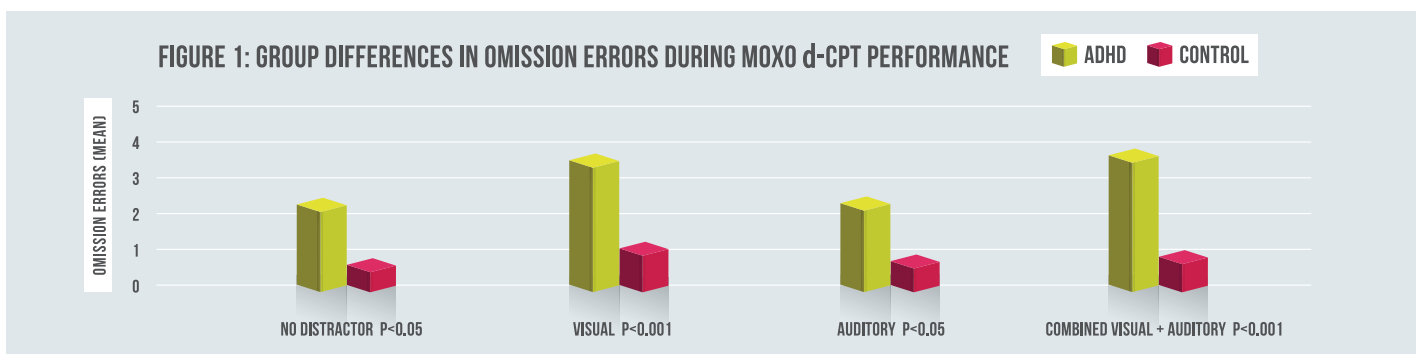
This study showed that adolescents with ADHD were more distracted than controls during all MOXO d-CPT distractors conditions (pure visual or auditory distractors and combined distractors). Distractibility of ADHD adolescents was marked in the presence of visual environmental stimuli or the combination of visual and auditory stimuli but not in the presence of auditory stimuli.

STUDY SUMMARY

- Population: 176 adolescents (ages 13-18 years), of them 133 with ADHD and 43 controls.
- Measures:
 - Parents and teachers form of Conner's ADHD/DSM IV scales.
 - Omission errors were observed during MOXO d-CPT performance.

RESULTS

- ADHD adolescents demonstrated significantly higher rates of omission errors than their unaffected peers in all MOXO d-CPT distractors conditions (Figure 1).
- ADHD adolescents produced significantly more omission errors in the presence of pure visual distractors and the combination of visual and auditory distractors than in no-distractors conditions. In contrast, distracting stimuli had no effect on CPT performance of non-ADHD adolescents.
- Receiver Operating Characteristic (ROC) analysis further demonstrated that independent of modality, the mere presence of distractors (AUC = 0.890) significantly improved the areas under the curve (AUC) of the test, as compared to the absence of distractors [$\chi^2(1, N = 176) = 8.51, p < 0.01$]. Specifically, the AUC of combined visual and auditory distractors was the highest. Pure visual and pure auditory distractors did not yield any diagnostic advantage over no-distractors conditions.



DISCUSSION

- Study results support the idea that ADHD is indeed marked by high distractibility and that teenagers with ADHD have difficulties to sustain attention in the presence of irrelevant environmental stimuli.
- Visual stimuli appeared as more potent distractor for ADHD adolescents than auditory, probably because MOXO d-CPT is based on a visual task channel, which is more vulnerable to visual distractors that use the same cognitive modality. It is also possible that due to impaired visual attention in ADHD, additional visual information easily overloads the cognitive/physiological system of an individual, thus interfering with his performance.
- The fact that adolescents with ADHD were distracted by external stimuli suggests that in everyday life these individuals may be more distracted by irrelevant stimuli in the classroom (e.g., someone talks in the next room) rather than background stimuli (e.g., music) or distractors that are part of the cognitive task.
- Incorporating environmental distractors improves the test's discriminative validity between ADHD adolescents and their non-affected peers. Thus, such a CPT test can be useful as an aiding tool in the diagnosis of ADHD in adolescents once employing appropriate task demands that better simulate distractibility in everyday life.