

## **Abstract**

While Autism Spectrum Disorders (ASD) and Attention-Deficit/Hyperactivity Disorder (ADHD) have both distinct and overlapping symptoms, verbal working memory (verbal WM) deficit places a difference in their cognitive impairments. The objective of this study was to compare verbal WM in pure ASD students (ASD-) to ASD students with attention problems or hyperactivity (ASD+), pure ADHD students (ADHD) and typically developing students (TD), then to examine the relationship between verbal WM and their academic performances. In study 1, to test for verbal working memory, 17 ASD-, 13 ASD+ and 68 ADHD grade 1 to 4 students were assessed with the digit span backward task (DSB), and the results were compared with TD students. In study 2, performances of these four subgroups in two practical academic tasks, Chinese reading comprehension, and arithmetic test, in which verbal WM was highly involved, were further investigated to study the role of verbal WM on their deficits in academic performances. The results of the DSB task were mainly consistent with the academic tasks, with the ADHD group showing the greatest level of impairment, followed by the ASD+, TD, and ASD- groups. Clear verbal WM deficits were displayed in the groups that possess attention impairments, while an ASD advantage was found although the result was not statistically significant. Educational and clinical implications were suggested based on the results.