

Digital Cognitive Profiling of Mild Cognitive Impairment in Primary Care: Evidence from the Altoida NeuroMarker Platform

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BACKGROUND

Digital cognitive assessments may provide a scalable solution in primary care to differentiate Mild Cognitive Impairment (MCI) from Subjective Cognitive Decline (SCD). We evaluated whether the Altoida NeuroMarker detects global and domain-specific cognitive differences between SCD and MCI in a primary care setting, and examined its convergent validity.

METHODS

The Altoida NeuroMarker platform is a 10-minute cognitive test battery conducted on an iOS device. It evaluates instrumental activities of daily living via motoric and augmented reality tasks, including tapping, tracing, and placing/finding virtual objects in a real environment (Image 1). We included 48 participants with cognitive complaints recruited in a primary care setting in Barcelona, classified as SCD (n=10; age=71.9±8.5; MMSE=28.1±1.4) or MCI (n=38; age=79.9±6.8; MMSE=23.8±3.1). MCI participants were further subclassified based on their clinical and pTau₂₁₇ profile into MCI-AD (n=22) or non-degenerative MCI (nd-MCI).

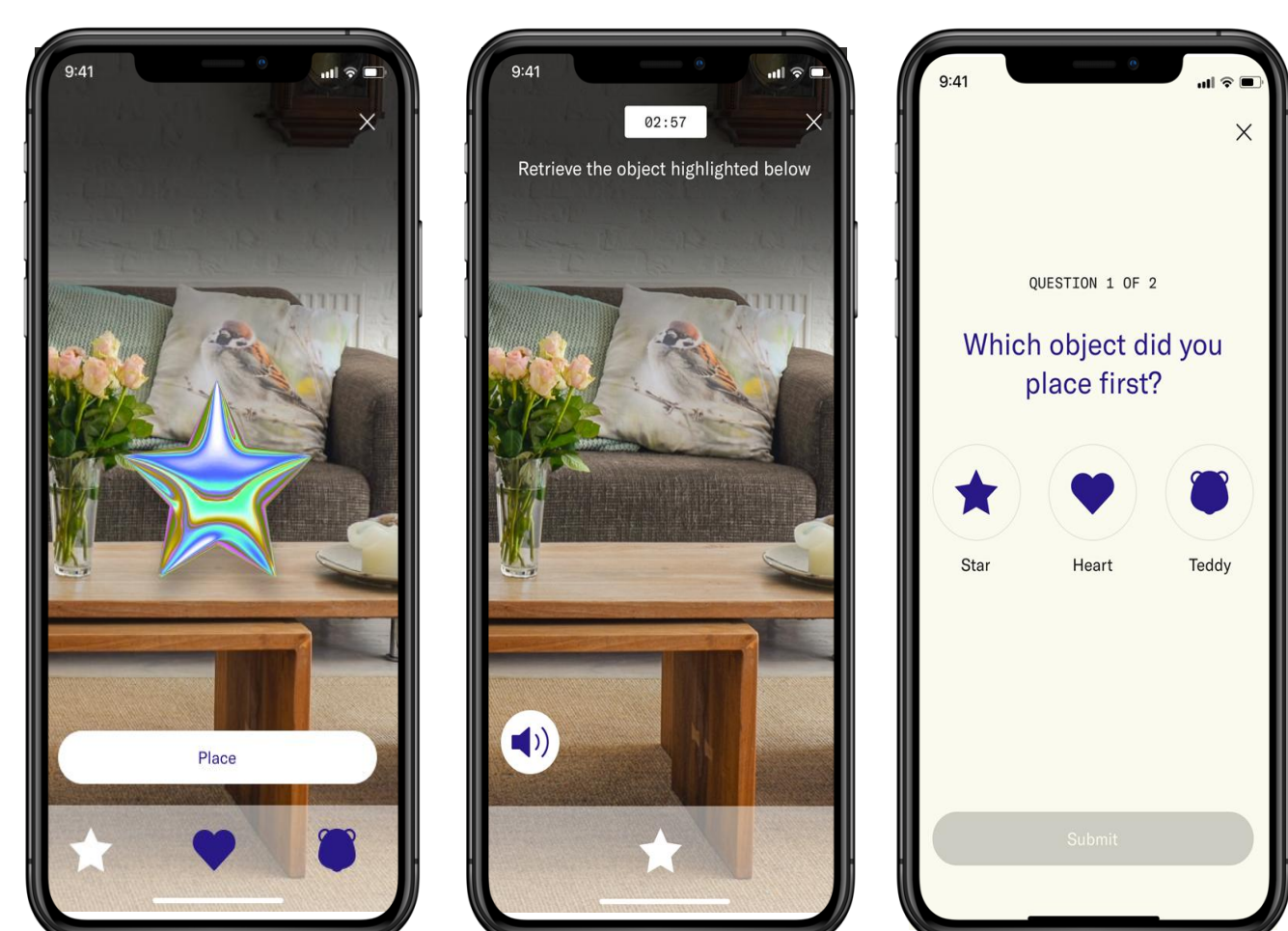


Image 1. The Altoida Neuromarker

The platform generates a global composite score reflecting overall cognitive performance, and scores of cognitive domains mapped to DSM-V. These domains comprise 14 task-derived cognitive subdomains

RESULTS

Participants with MCI showed significantly lower Altoida's global composite score compared with SCD (t=2.96, p<0.01). At the domain level, significant impairments were identified in perceptual-motor function (t=2.98, p<0.01), complex attention (t=3.02, p<0.01), and executive function (t=2.75, p<0.01) [Figure 1].

Significant differences were found in 10 subdomains: cued recall (t=3.25, p<0.01), sustained attention (t=2.54, p<0.05), selective attention (t=2.98, p<0.01), processing speed (t=2.66, p<0.05), planning (t=3.93, p<0.01), decision-making (t=3.08, p<0.01), responding to feedback (t=2.11, p<0.05), inhibition (t=2.46, p<0.05), visual perception (t=2.55, p<0.05), and perceptual-motor coordination (t=3.01, p<0.01). Differences in the composite were found between SCD and MCI-AD (t=2.68, p<0.05) and between SCD and nd-MCI (t=2.53, p<0.05).

Altoida's global composite demonstrated good diagnostic accuracy for identifying MCI (ROC-AUC=0.795) and showed strong convergent validity with the Memory Alteration Test (r=0.556, p<0.01; Figure 2), the most used screening test in our setting.

CONCLUSIONS

Altoida NeuroMarker is sensitive to global and domain-specific cognitive impairment and demonstrates good diagnostic performance and convergent validity in primary care. Our findings support its potential role within a scalable diagnostic framework applicable to primary care and other frontline settings.

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Figure 1. Group comparisons among the Altoida's NeuroMarker global and domain-specific score

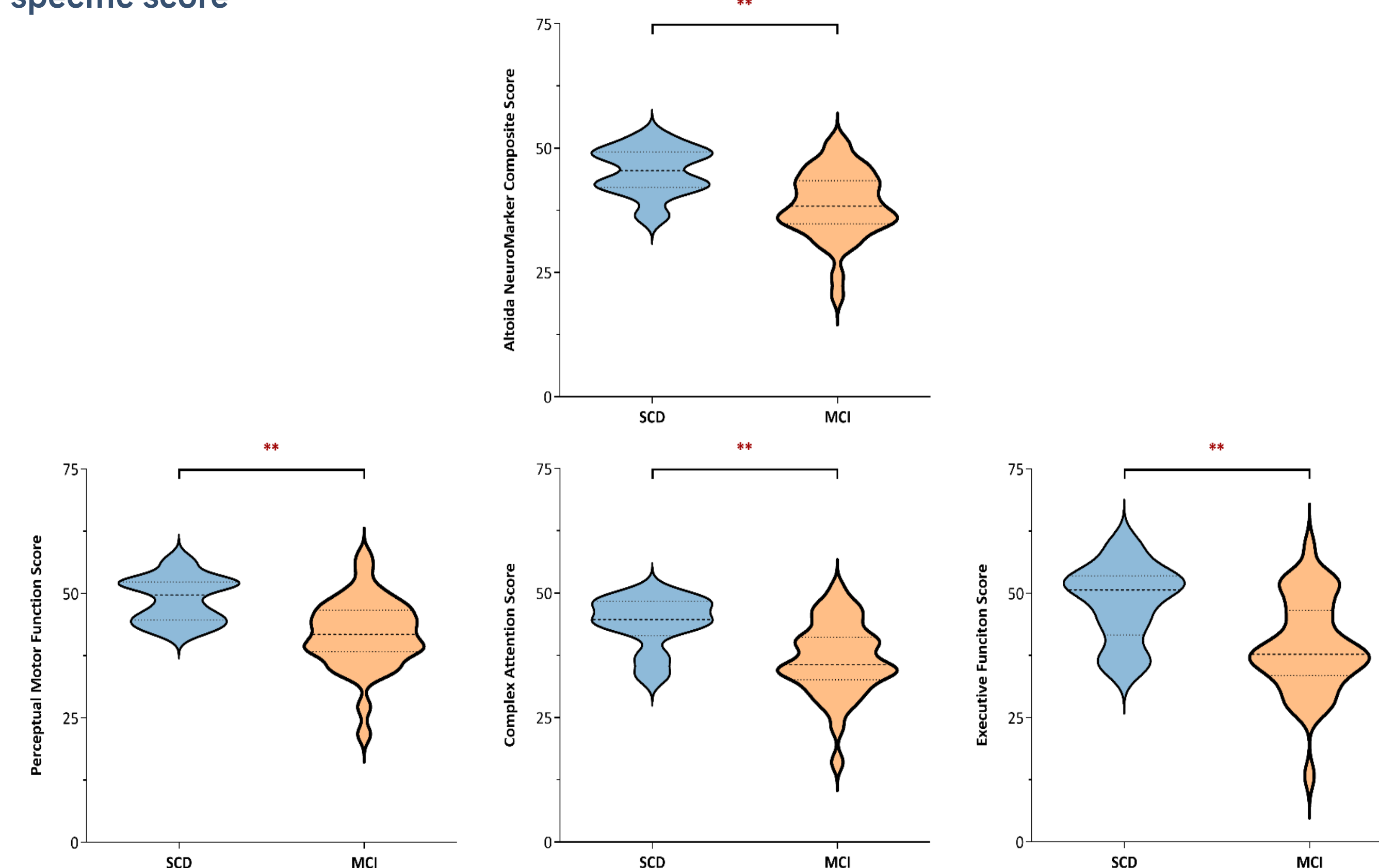


Figure 2. Correlations between the Memory Alteration Test and Altoida's Global Composite Score

