

Detection of Mild Cognitive Impairment Using In-clinic and Remote Unsupervised Digital Cognitive Assessments



Cogstate

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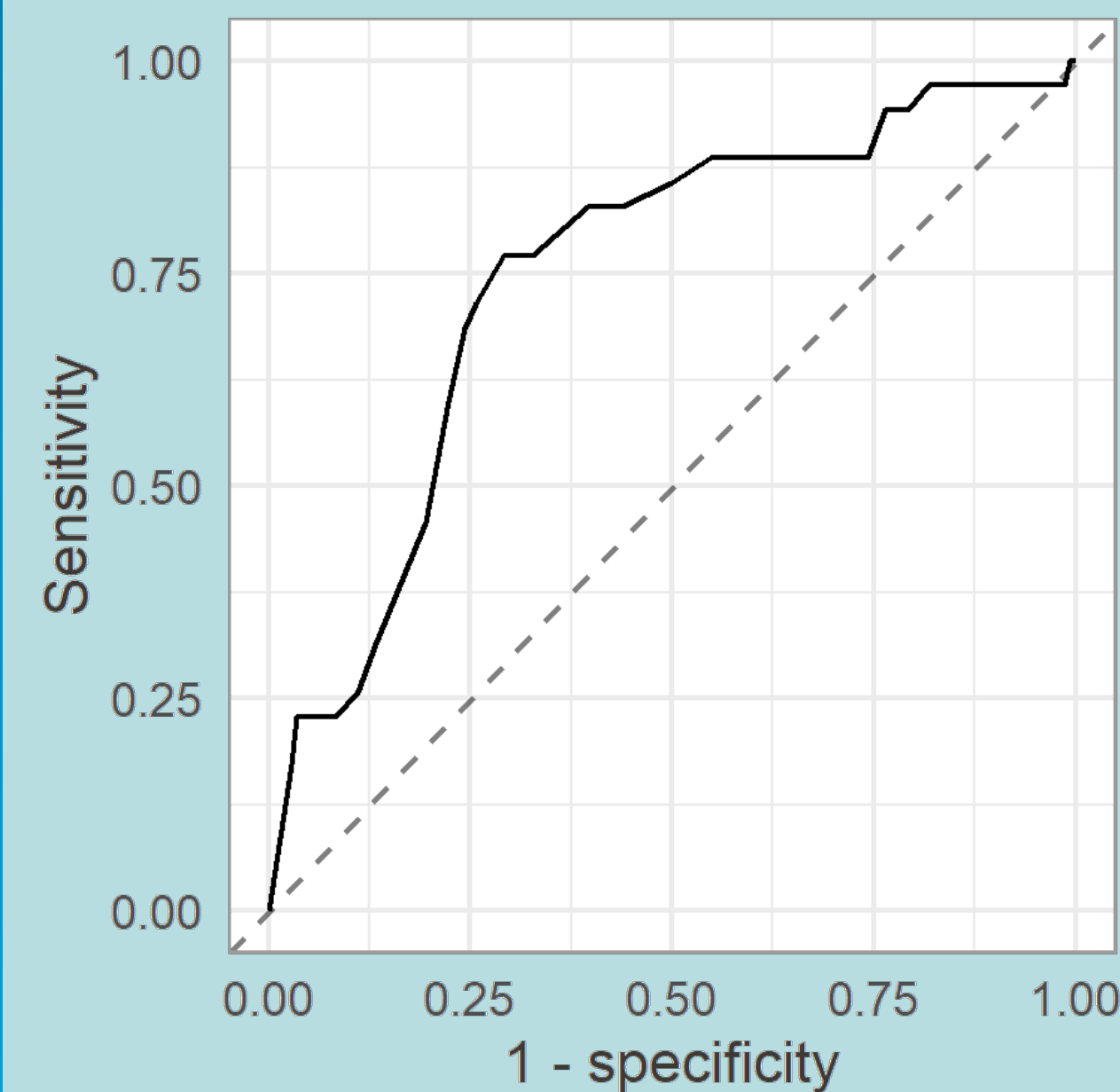
Background

- The Cogstate Brief Battery (CBB) is a digital cognitive assessment validated for Alzheimer's disease (AD) and unsupervised use
- The CBB assesses processing speed, attention, visual learning, and working memory and was offered to cognitively normal (CN) and mild cognitive impairment (MCI) participants in ADNI-3
- In-clinic visits were completed annually for MCI and every other year for CN, with both groups also able to complete unsupervised assessments at-home within 14 days of the first in-clinic visit and at up to 3 monthly intervals
- A short form of the One Card Learning test ("OCL48") has recently been developed to reduce participant burden and improve binary classification accuracy and data for the One Card Learning test presented here were transformed using a published scaling algorithm and updated normative data applied (White et al, 2021)

White JP, Schembri A, Edgar CJ, Lim YY, Masters CL and Maruff P (2021) A Paradox in Digital Memory Assessment: Increased Sensitivity With Reduced Difficulty. *Front. Digit. Health* 3:780303. doi: 10.3389/fdgth.2021.780303

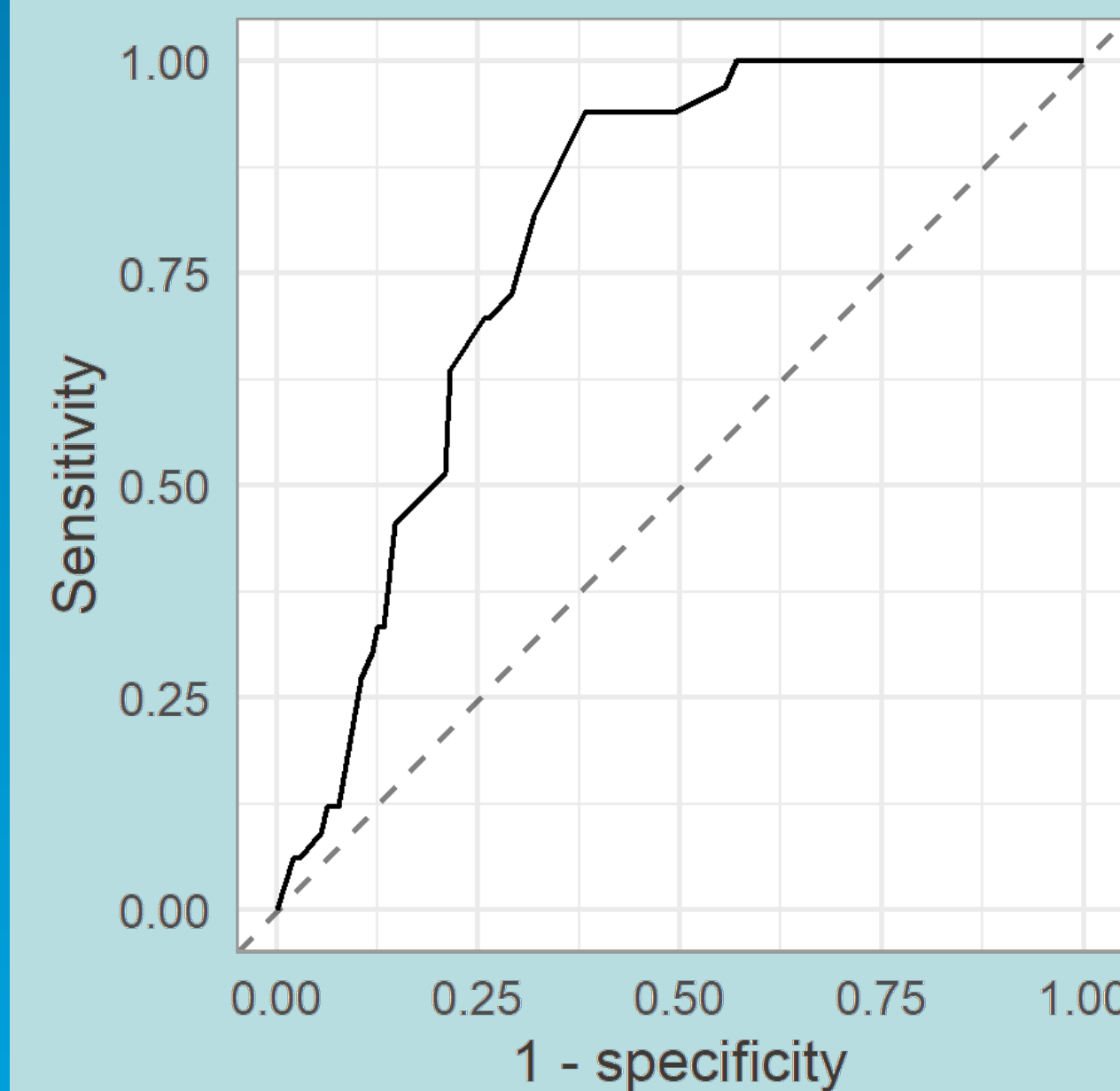
The CBB showed good ability to classify MCI-related cognitive impairment in ADNI3, both supervised in clinic, and remotely without supervision

In-Clinic AUC 0.75



One Card Learning Accuracy
AUC 0.747
[95% CI 0.655, 0.838]

At-home AUC 0.80



One Card Learning Accuracy
AUC 0.796
[95% CI [0.729, 0.863]

Method

- Participants were 146 CN older adults ($M_{age} = 72.1$, $SD = 6.43$, age range 57-90 years, 58.2% females) and 37 older adults with MCI ($M_{age} = 74.4$, $SD = 7.50$, age range 61-89 years, 51.4% females)
- All participants underwent PET scans and confirmation of diagnosis at Baseline
- Only participants with confirmed amyloid status were included in these analyses (i.e., all MCI participants were $A\beta+$ and all CU participants were $A\beta-$)
- Participants completed the CBB in a supervised in-clinic setting at Baseline, and again in an unsupervised remote setting within 90 days
- Receiver Operating Characteristic analyses were conducted to ascertain whether the classification performance of the CBB in detecting MCI was similar in both settings

Results

- All CBB measures showed a statistically significant ability to discriminate between CU $A\beta-$ and MCI $A\beta+$ participants at both the supervised in clinic baseline (AUCs 0.63-0.75) and initial remote visit (AUCs 0.63-0.78)
- There was no significant difference for any CBB measure in classification performance (measured by AUC) between remote and supervised assessment ($ps > 0.146$)