# Supplementary Material

Supplemental Table 1. Pairwise comparisons of characteristics between diagnostic groups.

| Pair | Age | Sex | Education | MMSE | MoCA | MoCA-MIS |
| --- | --- | --- | --- | --- | --- | --- |
| SCD – MCI | -5.78 ± 0.59,*p* < .001 | 0.18 ± 0.15,*p* = .972 | -0.20 ± 0.21,*p* = .993 | 1.37 ± 0.28,*p* < .001 | 2.33 ± 0.33,*p* < .001 | 3.62 ± 0.27,*p* < .001 |
| SCD – AD dementia | -4.44 ± 0.45,*p* < .001 | -0.36 ± 0.11,*p* = .044 | 0.51 ± 0.16,*p* = .036 | 7.00 ± 0.21,*p* < .001 | 8.64 ± 0.25,*p* < .001 | 5.85 ± 0.20,*p* < .001 |
| SCD – FTD | -2.44 ± 0.95,*p* = .226 | -0.34 ± 0.24,*p* = .913 | 0.45 ± 0.33,*p* = .940 | 4.24 ± 0.44,*p* < .001 | 6.35 ± 0.52,*p* < .001 | 4.04 ± 0.45,*p* < .001 |
| SCD – DLB | -8.47 ± 0.84,*p* < .001 | 1.13 ± 0.26,*p* < .001 | 0.24 ± 0.29,*p* = .999 | 5.07 ± 0.39,*p* < .001 | 6.90 ± 0.46,*p* < .001 | 3.60 ± 0.39,*p* < .001 |
| SCD – VD | -8.80 ± 1.18,*p* < .001 | 0.37 ± 0.31,*p* = .972 | 0.99 ± 0.41,*p* = .324 | 4.08 ± 0.55,*p* < .001 | 6.35 ± 0.65,*p* < .001 | 3.83 ± 0.54,*p* < .001 |
| SCD – PPA | -5.76 ± 1.15,*p* < .001 | -0.25 ± 0.29,*p* = .997 | 0.85 ± 0.41,*p* = .534 | 2.90 ± 0.54,*p* < .001 | 6.07 ± 0.64,*p* < .001 | 3.47 ± 0.52,*p* < .001 |
| SCD – Other dementia | -5.39 ± 1.07,*p* < .001 | -0.16 ± 0.27,*p* > .999 | 1.47 ± 0.38,*p* = .004 | 3.81 ± 0.50,*p* < .001 | 4.97 ± 0.59,*p* < .001 | 2.45 ± 0.48,*p* < .001 |
| SCD – Other neurology | 0.06 ± 0.81,*p* > .999 | 0.36 ± 0.21,*p* = .784 | 0.91 ± 0.28,*p* = .042 | 1.65 ± 0.38,*p* = .001 | 2.39 ± 0.45,*p* < .001 | 1.73 ± 0.36,*p* < .001 |
| SCD – PPD | 1.64 ± 0.56,*p* = .101 | 0.05 ± 0.14,*p* > .999 | 1.40 ± 0.20,*p* < .001 | 2.43 ± 0.26,*p* < .001 | 3.58 ± 0.31,*p* < .001 | 1.75 ± 0.25,*p* < .001 |
| MCI – AD dementia | 1.34 ± 0.59,*p* = .339 | -0.54 ± 0.15,*p* = .010 | 0.72 ± 0.20,*p* = .016 | 5.64 ± 0.27,*p* < .001 | 6.31 ± 0.32,*p* < .001 | 2.23 ± 0.26,*p* < .001 |
| MCI – FTD | 3.34 ± 1.02,*p* = .036 | -0.52 ± 0.26,*p* = .566 | 0.65 ± 0.36,*p* = .714 | 2.88 ± 0.47,*p* < .001 | 4.02 ± 0.56,*p* < .001 | 0.43 ± 0.48,*p* = .997 |
| MCI – DLB | -2.69 ± 0.92,*p* = .100 | 0.95 ± 0.27,*p* = .019 | 0.44 ± 0.32,*p* = .938 | 3.70 ± 0.43,*p* < .001 | 4.57 ± 0.51,*p* < .001 | -0.01 ± 0.43,*p* > .999 |
| MCI – VD | -3.02 ± 1.24,*p* = .308 | 0.19 ± 0.32,*p* > .999 | 1.19 ± 0.43,*p* = .151 | 2.71 ± 0.58,*p* < .001 | 4.02 ± 0.69,*p* < .001 | 0.22 ± 0.57,*p* > .999 |
| MCI – PPA | 0.02 ± 1.21,*p* > .999 | -0.44 ± 0.30,*p* = .916 | 1.06 ± 0.43,*p* = .288 | 1.53 ± 0.56,*p* = .168 | 3.74 ± 0.67,*p* < .001 | -0.15 ± 0.55,*p* > .999 |
| MCI – Other dementia | 0.39 ± 1.14,*p* > .999 | -0.34 ± 0.28,*p* = .972 | 1.68 ± 0.40,*p* = .001 | 2.44 ± 0.53,*p* < .001 | 2.63 ± 0.63,*p* = .001 | -1.17 ± 0.51,*p* = .401 |
| MCI – Other neurology | 5.85 ± 0.89,*p* < .001 | 0.18 ± 0.23,*p* = .999 | 1.11 ± 0.31,*p* = .013 | 0.28 ± 0.42,*p* > .999 | 0.06 ± 0.50,*p* > .999 | -1.89 ± 0.40,*p* < .001 |
| MCI – PPD | 7.42 ± 0.68,*p* < .001 | -0.13 ± 0.17,*p* = .999 | 1.60 ± 0.24,*p* < .001 | 1.06 ± 0.31,*p* = .026 | 1.25 ± 0.37,*p* = .030 | -1.87 ± 0.30,*p* < .001 |
| AD dementia – FTD | 2.00 ± 0.94,*p* = .512 | 0.02 ± 0.23,*p* > .999 | -0.06 ± 0.33,*p* > .999 | -2.76 ± 0.44,*p* < .001 | -2.29 ± 0.52,*p* < .001 | -1.80 ± 0.44,*p* = .002 |
| AD dementia – DLB | -4.02 ± 0.83,*p* < .001 | 1.49 ± 0.26,*p* < .001 | -0.28 ± 0.29,*p* = .995 | -1.93 ± 0.39,*p* < .001 | -1.74 ± 0.46,*p* = .007 | -2.25 ± 0.39,*p* < .001 |
| AD dementia – VD | -4.36 ± 1.18,*p* = .009 | 0.73 ± 0.31,*p* = .342 | 0.48 ± 0.41,*p* = .978 | -2.92 ± 0.55,*p* < .001 | -2.29 ± 0.65,*p* = .017 | -2.01 ± 0.54,*p* = .008 |
| AD dementia – PPA | -1.32 ± 1.15,*p* = .980 | 0.11 ± 0.29,*p* > .999 | 0.34 ± 0.41,*p* = .998 | -4.11 ± 0.53,*p* < .001 | -2.57 ± 0.64,*p* = .002 | -2.38 ± 0.52,*p* < .001 |
| AD dementia – Other dementia | -0.95 ± 1.07,*p* = .997 | 0.20 ± 0.27,*p* = .999 | 0.96 ± 0.37,*p* = .236 | -3.19 ± 0.50,*p* < .001 | -3.68 ± 0.59,*p* < .001 | -3.40 ± 0.48,*p* < .001 |
| AD dementia – Other neurology | 4.51 ± 0.81,*p* < .001 | 0.72 ± 0.21,*p* = .020 | 0.40 ± 0.28,*p* = .923 | -5.35 ± 0.38,*p* < .001 | -6.25 ± 0.45,*p* < .001 | -4.12 ± 0.36,*p* < .001 |
| AD dementia – PPD | 6.08 ± 0.55,*p* < .001 | 0.42 ± 0.14,*p* = .083 | 0.89 ± 0.19,*p* < .001 | -4.58 ± 0.26,*p* < .001 | -5.06 ± 0.31,*p* < .001 | -4.10 ± 0.25,*p* < .001 |
| FTD – DLB | -6.02 ± 1.18,*p* < .001 | 1.47 ± 0.33,*p* < .001 | -0.21 ± 0.41,*p* > .999 | 0.83 ± 0.55,*p* = .888 | 0.55 ± 0.65,*p* = .998 | -0.44 ± 0.56,*p* = .999 |
| FTD – VD | -6.35 ± 1.44,*p* = .001 | 0.72 ± 0.37,*p* = .657 | 0.54 ± 0.50,*p* = .987 | -0.16 ± 0.67,*p* > .999 | -0.002 ± 0.80,*p* > .999 | -0.21 ± 0.67,*p* > .999 |
| FTD – PPA | -3.31 ± 1.42,*p* = 365 | 0.09 ± 0.35,*p* > .999 | 0.40 ± 0.50,*p* = .999 | -1.34 ± 0.66,*p* = .572 | -0.28 ± 0.79,*p* > .999 | -0.58 ± 0.65,*p* = .997 |
| FTD – Other dementia | -2.95 ± 1.35,*p* = .473 | 0.18 ± 0.34,*p* > .999 | 1.02 ± 0.47,*p* = .488 | -0.43 ± 0.63,*p* > .999 | -1.39 ± 0.75,*p* = .704 | -1.60 ± 0.62,*p* = .238 |
| FTD – Other neurology | 2.51 ± 1.16,*p* = .481 | 0.70 ± 0.30,*p* = .333 | 0.46 ± 0.40,*p* = .981 | -2.59 ± 0.54,*p* < .001 | -3.96 ± 0.64,*p* < .001 | -2.32 ± 0.53,*p* < .001 |
| FTD – PPD | 4.08 ± 1.00,*p* = .002 | 0.40 ± 0.25,*p* = .856 | 0.95 ± 0.35,*p* = .168 | -1.82 ± 0.47,*p* = .004 | -2.77 ± 0.55,*p* < .001 | -2.30 ± 0.47,*p* < .001 |
| DLB – VD | -0.33 ± 1.38,*p* > .999 | -0.76 ± 0.39,*p* = .621 | 0.75 ± 0.48,*p* = .861 | -0.99 ± 0.64,*p* 0.874 | -0.55 ± 0.76,*p* = .999 | 0.23 ± 0.64,*p* > .999 |
| DLB – PPA | 2.71 ± 1.35,*p* = .595 | -1.38 ± 0.37,*p* = .006 | 0.62 ± 0.48,*p* = .954 | -2.17 ± 0.63,*p* = .020 | 0.83 ± 0.75,*p* = .984 | -0.14 ± 0.62,*p* > .999 |
| DLB – Other dementia | 3.07 ± 1.28,*p* = .328 | -1.29 ± 0.35,*p* = .009 | 1.24 ± 0.45,*p* = .153 | -1.26 ± 0.60,*p* = .519 | -1.94 ± 0.71,*p* = .163 | -1.15 ± 0.59,*p* = .625 |
| DLB – Other neurology | 8.53 ± 1.07,*p* < .001 | -0.77 ± 0.31,*p* = .291 | 0.68 ± 0.37,*p* = .734 | -3.42 ± 0.50,*p* < .001 | -4.51 ± 0.60,*p* < .001 | -1.88 ± 0.49,*p* = .005 |
| DLB – PPD | 10.10 ± 0.90,*p* < .001 | -1.08 ± 0.27,*p* = .003 | 1.16 ± 0.31,*p* = .008 | -2.64 ± 0.42,*p* < .001 | -3.32 ± 0.50,*p* < .001 | -1.86 ± 0.42,*p* < .001 |
| VD – PPA | 3.04 ± 1.59,*p* = .659 | -0.63 ± 0.41,*p* = .875 | -0.14 ± 0.56,*p* > .999 | -1.18 ± 0.74,*p* = 0.847 | -0.28 ± 0.88,*p* > .999 | -0.37 ± 0.73,*p* > .999 |
| VD – Other dementia | 3.41 ± 1.53,*p* = .439 | -0.53 ± 0.39,*p* = .939 | 0.48 ± 0.53,*p* = .996 | -0.27 ± 0.71,*p* > .999 | -1.38 ± 0.85,*p* = .832 | -1.39 ± 0.70,*p* = .610 |
| VD – Other neurology | 8.86 ± 1.36,*p* < .001 | -0.01 ± 0.36,*p* > .999 | -0.08 ± 0.47,*p* > .999 | -2.43 ± 0.63,*p* = .005 | -3.96 ± 0.75,*p* < .001 | -2.11 ± 0.62,*p* = .024 |
| VD – PPD | 10.43 ± 1.23,*p* < .001 | -0.32 ± 0.32,*p* = .993 | 0.41 ± 0.43,*p* = .994 | -1.65 ± 0.57,*p* = .106 | -2.77 ± 0.68,*p* = .002 | -2.09 ± 0.56,*p* = .008 |
| PPA – Other dementia | 0.37 ± 1.51,*p* > .999 | -0.09 ± 0.38,*p* > .999 | 0.62 ± 0.53,*p* = .977 | 0.91 ± 0.70,*p* =.953 | -1.11 ± 0.83,*p* = .948 | -1.02 ± 0.68,*p* = .895 |
| PPA – Other neurology | 5.82 ± 1.33,*p* = .001 | 0.62 ± 0.34,*p* = .715 | 0.06 ± 0.47,*p* > .999 | -1.25 ± 0.62,*p* = .591 | -3.68 ± 0.74,*p* < .001 | -1.74 ± 0.60,*p* = .107 |
| PPA – PPD | 7.40 ± 1.20,*p* < .001 | 0.31 ± 0.30,*p* = .990 | 0.55 ± 0.42,*p* = .956 | -0.47 ± 0.56,*p* =.998 | -2.49 ± 0.66,*p* = .007 | -1.72 ± 0.54,*p* = .050 |
| Other dementia – Other neurology | 5.46 ± 1.26,*p* = .001 | 0.53 ± 0.32,*p* = .829 | -0.56 ± 0.44,*p* = .960 | -2.16 ± 0.59,*p* = .009 | -2.58 ± 0.70,*p* = .009 | -0.72 ± 0.57,*p* = .959 |
| Other dementia – PPD | 7.03 ± 1.12,*p* < .001 | 0.22 ± 0.28,*p* = .999 | -0.07 ± 0.39,*p* > .999 | -1.38 ± 0.52,*p* = .193 | -1.39 ± 0.62,*p* = .433 | -0.70 ± 0.51,*p* = .931 |
| Other neurology – PPD | 1.57 ± 0.87,*p* = .735 | -0.31 ± 0.23,*p* = .939 | 0.49 ± 0.30,*p* = .845 | 0.78 ± 0.41,*p* = .663 | 1.19 ± 0.48,*p* = .292 | 0.02 ± 0.39,*p* > .999 |

*Note:* Displaying estimate ± standard deviation and adjusted *p*-value. P-values have been adjusted for multiple comparisons with Tukey’s Honest Significant Difference post-hoc test. Estimates with adjusted *p*-values > .05 are grayed out.

*Abbreviations:* AD, Alzheimer’s disease; DLB, dementia with Lewy bodies; FTD, frontotemporal dementia; PPA, primary progressive aphasia; PPD, primary psychiatric diagnosis; SCD, subjective cognitive decline; VD, vascular dementia.

Supplemental Table 2. Correlation between MMSE and MoCA, by diagnostic group.

|  |  |
| --- | --- |
| Diagnostic group | Correlation |
| All | 0.86 [0.85, 0.87] |
| SCD | 0.56 [0.50, 0.61] |
| MCI | 0.55 [0.46, 0.63] |
| AD dementia | 0.85 [0.83, 0.87] |
| FTD | 0.81 [0.72, 0.87] |
| DLB | 0.80 [0.72, 0.86] |
| VD | 0.81 [0.69, 0.89] |
| PPA | 0.69 [0.52, 0.81] |
| Other dementia | 0.77 [0.64, 0.85] |
| Other neurology | 0.73 [0.63, 0.80] |
| PPD | 0.83 [0.79, 0.86] |

*Note:* Displaying Pearson’s *r* correlation coefficient with 95% confidence intervals.

*Abbreviations:* AD, Alzheimer’s disease; DLB, dementia with Lewy bodies; FTD, frontotemporal dementia; MCI, mild cognitive impairment; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; PPA, primary progressive aphasia; PPD, primary psychiatric diagnosis; SCD, subjective cognitive decline; VD, vascular dementia.

Table 3. Number and proportion of patients scoring at the ceiling (30 points) and below conventional and norm-adjusted cutoffs, on MMSE and MoCA.

|  | MMSE |  |  | MOCA |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | At ceiling | Below conventional cutoff | Below norm-adjusted cutoff1 | At ceiling | Below conventional cutoff | Below norm-adjusted cutoff1 |
| All | 230 (9.9) | 653 (28.1) | 1,168 (50.6) | 33 (1.4) | 1,807 (77.7) | 654 (28.3) |
| SCD | 152 (24.7) | 9 (1.5) | 89 (14.6) | 26 (4.2) | 288 (46.8) | 15 (2.5) |
| MCI | 24 (9.1) | 20 (7.6) | 93 (35.4) | 0 (0.0) | 220 (83.7) | 23 (8.7) |
| AD dementia | 8 (1.2) | 414 (61.8) | 568 (85.2) | 0 (0.0) | 663 (99.0) | 402 (60.3) |
| FTD | 3 (3.7) | 29 (35.8) | 49 (61.3) | 0 (0.0) | 75 (92.6) | 33 (41.3) |
| DLB | 2 (1.9) | 54 (50.0) | 80 (74.8) | 0 (0.0) | 102 (94.4) | 54 (50.5) |
| VD | 2 (4.0) | 17 (34.0) | 32 (64.0) | 0 (0.0) | 48 (96.0) | 21 (42.0) |
| PPA | 1 (1.9) | 14 (26.9) | 24 (48.0) | 0 (0.0) | 45 (86.5) | 17 (34.0) |
| Other dementia | 2 (3.2) | 19 (30.6) | 41 (67.2) | 0 (0.0) | 57 (91.9) | 17 (27.9) |
| Other neurology | 10 (8.5) | 14 (12.0) | 48 (41.0) | 4 (3.4) | 82 (70.1) | 12 (10.3) |
| PPD | 26 (8.5) | 63 (20.5) | 144 (47.4) | 3 (1.0) | 227 (73.9) | 60 (19.7) |

Note: All data are displayed as *n* (%). MMSE conventional cutoff <24; MoCA conventional cutoff <26. Norm-adjusted cutoffs are adjusted for age, sex, and education. 1 excluding *n* = 15 patients for whom educational attainment was unknown.

*Abbreviations:* AD, Alzheimer’s disease; DLB, dementia with Lewy bodies; FTD, frontotemporal dementia; MCI, mild cognitive impairment; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; PPA, primary progressive aphasia; PPD, primary psychiatric diagnosis; SCD, subjective cognitive decline; VD, vascular dementia.

Supplementary Table 4. Mini-Mental State Examination item-level scores, in the whole sample and by diagnostic group.

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Item | Whole sample | scd | mci | ad dementia | ftd | DLB | VD | ppa | Other dementia | Other neurology | ppd |
| Oriented in timeCompletely oriented1YearSeasonMonthDateDay of the week | 1,316 (65.0)1,836 (90.7)1,781 (88.0)1,826 (90.2)1,566 (77.3)1,742 (86.1) | 468 (88.5)524 (98.9)514 (97.0)522 (98.5)504 (95.1)518 (97.9) | 171 (76.0)218 (96.9)214 (95.1)213 (94.7)190 (84.4)210 (93.3) | 205 (34.8)463 (78.3)445 (75.3)457 (77.2)307 (51.9)400 (67.7) | 45 (65.2)65 (94.2)61 (88.4)64 (92.8)55 (79.7)59 (85.5) | 45 (53.6)72 (84.7)73 (85.9)77 (90.6)64 (75.3)77 (91.7) | 19 (41.3)41 (89.1)41 (89.1)36 (78.3)31 (67.4)36 (78.3) | 41 (87.2)46 (97.9)43 (91.5)47 (100.0)45 (95.7)46 (97.9) | 39 (70.9)49 (89.1)47 (85.5)50 (90.9)46 (83.6)48 (87.3) | 81 (79.4)99 (97.1)99 (97.1)99 (97.1)93 (91.2)94 (92.2) | 202 (74.0)259 (94.5)244 (88.7)261 (95.6)231 (84.0)254 (92.0) |
| Oriented in spaceCompletely oriented1ProvinceCityBuildingDepartmentFloor | 1,165 (57.9)1,727 (85.4)1,943 (96.0)1,832 (90.6)1,589 (78.5)1,548 (76.4) | 442 (83.7)500 (94.5)529 (99.8)525 (99.1)504 (95.3)495 (93.4) | 147 (65.6)212 (94.2)223 (99.1)216 (96.4)188 (83.6)182 (80.9) | 177 (30.3)444 (75.3)528 (89.5)468 (79.5)354 (59.9)336 (56.8) | 30 (43.5)56 (81.2)66 (95.7)58 (84.1)52 (75.4)41 (59.4) | 39 (47.0)69 (81.2)83 (97.6)74 (88.1)59 (69.4)60 (71.4) | 24 (53.3)37 (82.2)41 (89.1)43 (93.5)31 (67.4)36 (78.3) | 27 (57.4)41 (87.2)46 (97.9)43 (91.5)34 (72.4)39 (83.0) | 26 (47.3)46 (83.6)55 (100.0)47 (85.5)44 (80.0)38 (69.1) | 64 (63.4)91 (90.1)100 (98.0)98 (96.1)80 (78.4)83 (81.4) | 189 (68.7)231 (83.7)272 (98.9)260 (94.2)243 (88.0)238 (86.2) |
| Immediate recallAll21None | 1,953 (96.7)48 (2.4)15 (0.7)4 (0.2) | 527 (99.6)2 (0.4)0 (0.0)0 (0.0) | 223 (99.1)1 (0.4)1 (0.4)0 (0.0) | 552 (93.9)23 (3.9)11 (1.9)2 (0.3) | 65 (94.2)3 (4.3)0 (0.0) 1 (1.5) | 75 (88.2)8 (9.4)1 (1.2)1 (1.2) | 45 (97.8)0 (0.0)1 (2.2)0 (0.0) | 45 (95.7)2 (4.3)0 (0.0)0 (0.0) | 54 (98.2)1 (1.8)0 (0.0)0 (0.0) | 99 (98.0)2 (2.0)0 (0.0)0 (0.0) | 268 (97.5)6 (2.2)1 (0.4)0 (0.0) |
| Serial 7sAll4321None | 1,005 (49.7)355 (17.5)214 (10.6)141 (7.0)186 (9.2)122 (6.0) | 381 (72.0)101 (19.1)26 (4.9)13 (2.5)7 (1.3)2 (0.4) | 143 (63.6)36 (16.0)25 (11.1)13 (5.8)7 (3.1)1 (0.4) | 165 (27.8)89 (15.0)80 (13.5)58 (9.8)115 (19.4)85 (14.4) | 31 (45.6)12 (17.6)9 (13.2)5 (7.4)6 (8.8)5 (7.4) | 17 (20.2)16 (19.0)12 (14.3)14 (16.7)20 (23.8)5 (6.0) | 22 (47.8)5 (10.9)8 (17.4)4 (8.7)2 (4.3)5 (10.9) | 28 (59.6)9 (19.1)5 (10.6)2 (4.3)2 (4.3)1 (2.1) | 18 (32.7)15 (27.3)7 (12.7)5 (9.1)6 (10.9)4 (7.3) | 64 (62.7)16 (15.7)7 (6.9)7 (6.9)6 (5.9)2 (2.0) | 136 (49.6)56 (20.4)35 (12.8)20 (7.3)15 (5.5)12 (4.4) |
| Delayed recallAll21None | 519 (25.7)491 (24.3)531 (26.3)479 (23.7) | 252 (47.6)151 (28.5)87 (16.4)39 (7.4) | 61 (27.1)60 (26.7)68 (30.2)36 (16.0) | 50 (8.5)86 (14.6)193 (32.7)262 (44.3) | 12 (17.6)16 (23.5)19 (27.9)21 (30.9) | 13 (15.3)21 (24.7)19 (22.4)32 (37.6) | 9 (20.5)10 (22.7)10 (22.7)15 (34.1) | 10 (21.3)19 (40.4)6 (12.8)12 (25.5) | 9 (16.4)9 (16.4)22 (40.0)15 (27.3) | 31 (31.0)22 (22.0)32 (32.0)15 (15.0) | 72 (26.2)96 (34.9)75 (27.3)32 (11.6) |
| Object namingBoth1None | 1,984 (98.0)33 (1.6)7 (0.3) | 528 (99.6)2 (0.4)0 (0.0) | 224 (99.6)1 (0.4)0 (0.0) | 572 (96.6)18 (3.0)2 (0.3) | 66 (95.7)1 (1.4)2 (2.9) | 84 (100.0)0 (0.0)0 (0.0) | 45 (97.8)1 (2.2)0 (0.0) | 38 (80.9)7 (14.9)2 (4.3) | 55 (100.0)0 (0.0)0 (0.0) | 102 (100.0)0 (0.0)0 (0.0) | 270 (98.5)3 (1.1)1 (0.4) |
| Repetition | 1,609 (82.3) | 458 (88.8) | 198 (91.7) | 431 (75.4) | 56 (83.6) | 67 (80.7) | 38 (86.4) | 32 (69.6) | 43 (79.6) | 89 (91.8) | 197 (75.5) |
| Reading | 1,857 (94.9) | 508 (98.6) | 211 (98.6) | 517 (90.5) | 60 (89.6) | 74 (89.2) | 42 (95.5) | 41 (89.1) | 49 (90.7) | 97 (99.0) | 258 (97.7) |
| Stage commandAll steps correct2 steps correct1 step correctNone correct | 1,700 (84.0)257 (12.7)56 (2.8)10 (0.5) | 501 (94.5)28 (5.3)1 (0.2)0 (0.0) | 211 (93.8)12 (5.3)2 (0.9)0 (0.0) | 420 (71.2)126 (21.4)37 (6.3)7 (1.2) | 52 (75.4)14 (20.3)3 (4.3)0 (0.0) | 65 (77.4)16 (19.0)2 (2.4)1 (1.2) | 38 (84.4)7 (15.6)0 (0.0)0 (0.0) | 33 (70.2)12 (25.5)2 (4.3)0 (0.0) | 45 (81.8)10 (18.2)0 (0.0)0 (0.0) | 94 (92.2)6 (5.9)1 (1.0)1 (1.0) | 241 (87.3)26 (9.4)8 (2.9)1 (0.4) |
| Writing | 1,784 (91.2) | 500 (97.1) | 204 (94.9) | 497 (86.6) | 59 (86.8) | 71 (85.5) | 39 (90.7) | 35 (76.1) | 48 (88.9) | 88 (91.7) | 243 (92.7) |
| Visuoconstruction | 1,533 (78.4) | 491 (95.5) | 198 (91.7) | 341 (59.8) | 53 (77.9) | 39 (47.6) | 26 (59.1) | 39 (84.8) | 37 (68.5) | 84 (86.6) | 225 (85.2) |

All data displayed as number (valid percentage, i.e., excluding missing values). Due to rounding, percentages may not always add exactly to 100. 1 This row represents the patients who got all five sub-items correct.

*Abbreviations:* AD, Alzheimer’s disease; DLB, dementia with Lewy bodies; FTD, frontotemporal dementia; MCI, mild cognitive impairment; PPA, primary progressive aphasia; PPD, primary psychiatric disorder; SCD, subjective cognitive decline; VD, vascular dementia.

Supplementary Table 5. Montreal Cognitive Assessment item-level scores, in the whole sample and by diagnosis.

| Item | Whole sample | scd | mci | ad dementia | ftd | DLB | VD | ppa | Other dementia | Other neurology | ppd |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Alternating trail | 1,342 (66.5) | 469 (88.7) | 170 (75.9) | 260 (44.1) | 41 (59.4) | 24 (28.2) | 20 (43.5) | 38 (80.9) | 31 (56.4) | 81 (78.6) | 208 (76.5) |
| Cube copy | 1,153 (57.2) | 415 (78.6) | 171 (76.7) | 222 (37.8) | 32 (46.4) | 30 (35.7) | 20 (43.5) | 33 (70.2) | 21 (38.2) | 57 (55.3) | 152 (55.9) |
| ClockAll elements21None | 1,139 (56.5)469 (23.3)347 (17.2)60 (3.0) | 426 (80.5)83 (15.7)19 (3.6)1 (0.2) | 160 (71.4)50 (22.3)14 (6.3)0 (0.0) | 174 (29.5)162 (27.5)205 (34.8)48 (8.1) | 28 (40.6)24 (34.8)14 (20.3)3 (4.3) | 16 (19.0)28 (33.3)37 (44.0)3 (3.6) | 17 (37.0)15 (32.6)13 (28.3)1 (2.2) | 24 (52.2)18 (39.1)3 (6.5)1 (2.2) | 27 (49.1)19 (34.5)7 (12.7)2 (3.6) | 80 (77.7)15 (14.6)8 (7.8)0 (0.0) | 187 (69.3)55 (20.4)27 (10.0)1 (0.4) |
| Animal namingAll21None | 1,721 (85.0)223 (11.0)53 (2.6)28 (1.4) | 495 (93.4)31 (5.8)3 (0.6)1 (0.2) | 207 (92.4)16 (7.1)1 (0.4)0 (0.0) | 457 (77.3)93 (15.7)28 (4.7)13 (2.2) | 44 (63.8)19 (27.5)4 (5.8)2 (2.9) | 78 (91.8)5 (5.9)2 (2.4)0 (0.0) | 39 (84.8)7 (15.2)0 (0.0)0 (0.0) | 26 (55.3)6 (12.8)4 (8.5)11 (23.4) | 43 (78.2)10 (18.2)2 (3.6)0 (0.0) | 92 (89.3)9 (8.7)2 (1.9)0 (0.0) | 240 (87.3)27 (9.8)7 (2.5)1 (0.4) |
| Immediate recall, 1st trialAll4321None | 720 (35.7)527 (26.1)336 (16.6)187 (9.3)93 (4.6)156 (7.7) | 300 (56.7)125 (23.6)57 (10.8)22 (4.2)3 (0.6)22 (4.2) | 104 (46.4)61 (27.2)39 (17.4)7 (3.1)3 (1.3)10 (4.5) | 130 (22.1)125 (21.2)115 (19.5)88 (14.9)52 (8.8)79 (13.4) | 16 (23.2)18 (26.1)12 (17.4)10 (14.5)7 (10.1)6 (8.7) | 13 (15.3)14 (16.5)15 (17.6)17 (20.0)10 (11.8)16 (18.8) | 9 (19.6)20 (43.5)8 (17.4)3 (6.5)4 (8.7)2 (4.3) | 15 (31.9)11 (23.4)11 (23.4)4 (8.5)2 (4.3)4 (8.5) | 12 (21.8)23 (41.8)11 (20.0)5 (9.1)1 (1.8)3 (5.5) | 34 (33.0)44 (42.7)13 (12.6)4 (3.9)4 (3.9)4 (3.9) | 87 (32.0)86 (31.6)55 (20.2)27 (9.9)7 (2.6)10 (3.7) |
| Immediate recall, 2nd trialAll4321None | 1,110 (55.0)441 (21.8)223 (11.0)72 (3.6)29 (1.4)145 (7.2) | 412 (77.9)57 (10.8)18 (3.4)6 (1.1)0 (0.0)36 (6.8) | 149 (66.5)45 (20.1)17 (7.6)2 (0.9)0 (0.0)11 (4.9) | 201 (34.1)163 (27.7)100 (17.0)43 (7.3)22 (3.7)60 (10.2) | 31 (44.9)19 (27.5)9 (13.0)4 (5.8)0 (0.0)6 (8.7) | 31 (36.5)23 (27.1)17 (20.0)6 (7.1)2 (2.4)6 (7.1) | 24 (52.2)13 (28.3)7 (15.2)0 (0.0)0 (0.0)2 (4.3) | 23 (48.9)10 (21.3)8 (17.0)2 (4.3)1 (2.1)3 (6.4) | 27 (49.1)11 (20.0)10 (18.2)1 (1.8)0 (0.0)6 (10.9) | 59 (57.3)29 (28.2)9 (8.7)1 (1.0)1 (1.0)4 (3.9) | 153 (56.0)71 (26.0)28 (10.3)7 (2.6)3 (1.0)11 (4.0) |
| Digit span forward | 1,694 (83.7) | 491 (92.8) | 202 (90.2) | 454 (76.6) | 57 (82.6) | 65 (77.4) | 39 (84.8) | 41 (87.2) | 44 (80.0) | 93 (90.3) | 208 (76.2) |
| Digit span backward | 1,626 (80.4) | 476 (89.8) | 201 (89.7) | 427 (72.3) | 49 (71.0) | 57 (67.9) | 34 (73.9) | 40 (85.1) | 40 (72.7) | 91 (88.4) | 211 (77.0) |
| Vigilance (Go/No go) | 1,703 (85.2) | 502 (95.4) | 205 (92.8) | 451 (77.8) | 50 (75.8) | 58 (69.0) | 34 (73.9) | 36 (76.6) | 38 (70.4) | 97 (94.2) | 232 (85.0) |
| Serial 7s4 or 5 correct2 or 3 correct1 correctNone correct | 1,296 (64.4)378 (18.8)209 (10.4)130 (6.5) | 471 (88.8)48 (9.1)8 (1.5)3 (0.6) | 167 (75.2)47 (21.2)7 (3.2)1 (0.5) | 228 (38.7)143 (24.3)124 (21.1)94 (16.0) | 42 (61.8)15 (22.1)5 (7.4)6 (8.8) | 32 (39.5)24 (29.6)21 (25.9)4 (4.9) | 26 (56.5)12 (26.1)3 (6.5)5 (10.9) | 36 (78.3)8 (17.4)2 (4.3)0 (0.0) | 32 (58.2)12 (21.8)9 (16.4)2 (3.6) | 75 (73.5)17 (16.7)6 (5.9)4 (3.9) | 187 (68.2)52 (19.0)24 (8.8)11 (4.0) |
| RepetitionBoth1None | 910 (45.4)733 (36.6)362 (18.1) | 332 (63.4)151 (28.8)42 (7.8) | 130 (58.3)71 (31.8)22 (9.9) | 173 (29.5)253 (43.2)160 (27.3) | 29 (42.0)25 (36.2)15 (21.7) | 25 (30.1)43 (51.8)15 (18.1) | 26 (56.5)16 (34.8)4 (8.7) | 10 (21.7)18 (39.1)18 (39.1) | 25 (46.3)21 (38.9)8 (14.8) | 55 (53.9)34 (33.3)13 (12.7) | 105 (38.7)101 (37.3)65 (24.0) |
| Phonetic fluency | 1,038 (51.9) | 362 (69.0) | 144 (64.6) | 276 (47.1) | 16 (25.0) | 35 (42.7) | 12 (26.7) | 15 (31.9) | 10 (18.2) | 41 (40.2) | 127 (47.0) |
| Abstract reasoningBoth1None | 1,088 (54.1)688 (34.2)234 (11.6) | 393 (74.4)125 (23.7)10 (1.9) | 148 (66.4)66 (29.6)9 (4.0) | 229 (39.2)227 (38.9)128 (21.9) | 23 (33.8)27 (39.718 (26.5) | 27 (32.5)42 (50.6)14 (16.9) | 18 (39.1)21 (45.7)7 (15.2) | 19 (41.3)11 (23.9)16 (34.8) | 19 (35.2)29 (53.7)6 (11.1) | 62 (60.2)37 (35.9)4 (3.9) | 150 (54.5)103 (37.5)22 (8.0) |
| Spontaneous delayed recallAll4321None | 110 (5.4)164 (8.1)237 (11.7)299 (14.8)252 (12.5)961 (47.5) | 67 (12.7)99 (18.7)103 (19.5)113 (21.4)65 (12.3)82 (15.5) | 4 (1.8)8 (3.6)25 (11.2)30 (13.4)38 (17.0)119 (53.1) | 1 (0.2)4 (0.7)17 (2.9)43 (7.3)44 (7.4)481 (81.5) | 3 (4.3)3 (4.3)7 (10.1)8 (11.6)5 (7.2)43 (62.3) | 2 (2.4)2 (2.4)11 (12.9)12 (14.1)17 (20.0)41 (48.2) | 1 (2.2)0 (0.0)3 (6.5)6 (13.0)8 (17.4)28 (60.9) | 2 (4.3)5 (10.6)3 (6.4)8 (17.0)4 (8.5)25 (53.2) | 5 (9.1)5 (9.1)4 (7.3)9 (16.4)5 (9.1)27 (49.1) | 9 (8.7)6 (5.8)17 (16.5)16 (15.5)20 (19.4)35 (34.0) | 16 (5.8)32 (11.6)47 (17.1)54 (19.6)46 (16.7)80 (29.1) |
| OrientationAll54321None | 1,353 (67.2)326 (16.2)147 (7.3)70 (3.5)62 (3.1)36 (1.8)18 (0.9) | 478 (90.2)45 (8.5)4 (0.8)2 (0.4)0 (0.0)1 (0.2)0 (0.0) | 178 (79.8)31 (13.9)10 (4.5)3 (1.3)1 (0.4)0 (0.0)0 (0.0) | 217 (37.1)139 (23.8)85 (14.5)45 (7.7)52 (8.9)32 (5.5)15 (2.6) | 43 (63.2)17 (25.0)5 (7.4)0 (0.0)1 (1.5)1 (1.5)1 (1.5) | 45 (54.9)22 (26.8)8 (9.8)5 (6.1)2 (2.4)0 (0.0)0 (0.0) | 22 (47.8)11 (23.9)8 (17.4)2 (4.3)1 (2.2)2 (4.3)0 (0.0) | 41 (89.1)4 (8.7)1 (2.2)0 (0.0)0 (0.0)0 (0.0)0 (0.0) | 39 (70.9)6 (10.9)4 (7.3)4 (7.3)2 (3.6)0 (0.0)0 (0.0) | 80 (78.4)16 (15.7)5 (4.9)1 (1.0)0 (0.0)0 (0.0)0 (0.0) | 210 (76.4)35 (12.7)17 (6.2)8 (2.9)3 (1.1)0 (0.0)2 (0.7) |

All data displayed as number (percentage). Due to rounding, percentages may not always add exactly to 100.

*Abbreviations:* AD, Alzheimer’s disease; DLB, dementia with Lewy bodies; FTD, frontotemporal dementia; MCI, mild cognitive impairment; PPA, primary progressive aphasia; PPD, primary psychiatric disorder; SCD, subjective cognitive decline; VD, vascular dementia.

Supplemental Table 6. Linear models investigating the influence of patient characteristics on MMSE and MoCA total scores.

| Model | MMSE | MoCA |
| --- | --- | --- |
| B | 95%CI | B | 95%CI |
| 1: Age in years | -0.06 | [-0.08, -0.03] | -0.09 | [-0.11, -0.06] |
| 2: Female sex | -0.80 | [-1.17, -0.43] | -1.05 | [-1.49, -0.61] |
| 3: Education in years | 0.39 | [0.32, 0.45] | 0.54 | [0.46, 0.61] |
| 4: Diagnosismciad dementiaftddlbvdppaOther dementiaOther neurologyppd | -1.37-6.98-3.96-5.07-4.08-2.66-3.81-1.65-2.30 | [-1.89, -0.84][-7.38, -6.58][-4.80, -3.11][-5.82, -4.32][-5.13, -3.03][-3.69, -1.63][-4.76, -2.86][-2.37, -0.93][-2.80, -1.80] | -2.33-8.58-6.12-6.90-5.95-5.20-4.97-2.39-3.35 | [-2.95, -1.72][-9.04, -8.11][-7.11, -5.13][-7.78, -6.03][-7.18, -4.72][-6.41, -3.99][-6.08, -3.85][-3.23, -1.55][-3.93, -2.96] |
| 5: EverythingAge in yearsFemale sexeducation in yearsDiagnosismciad dementiaftddlbvdppaOther dementiaOther neurologyppd | 0.01-0.340.34-1.52-6.82-3.85-5.22-3.88-2.44-3.43-1.37-1.83 | [-0.01, 0.03][-0.64, -0.05][0.29, 0.39][-2.04, -1.00][-7.21, -6.42][-4.67, -3.03][-5.96, -4.48][-4.91, -2.86][-3.46, -1.42][-4.36, -2.49][-2.07, -0.67][-2.32, -1.34] | -0.00-0.510.48-2.45-8.28-5.93-6.93-5.52-4.59-4.37-2.00-2.71 | [-0.02, 0.02][-0.84, -0.17][0.42, 0.54][-3.04, -1.85][-8.73, -7.82][-6.87, -4.99][-7.77, -6.08][-6.69, -4.34][-5.76, -3.43][-5.44, -3.30][-2.80, -1.20][-3.27, -2.15] |

*Abbreviations:* AD, Alzheimer’s disease; DLB, dementia with Lewy bodies; FTD, frontotemporal dementia; MCI, mild cognitive impairment; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; PPA, primary progressive aphasia; PPD, primary psychiatric diagnosis; VD, vascular dementia; 95%CI, 95% confidence interval.

Supplemental Table 7. Estimates of patient characteristics’ influence on the relationship between MMSE and MoCA scores, from linear mixed models.

|  |  |
| --- | --- |
| Model | B [95%CI] |
| 0: No covariatesScreener | -3.76 [-3.87, -3.65] |
| 1: Age in yearsScreenerAgeAge x screener | -1.85 [-2.67, -1.03]-0.06 [-0.08, -0.03]-0.03 [-0.04, -0.02] |
| 2: Female sexScreenerSexSex x screener | -3.65 [-3.80, -3.51]-0.80 [-1.21, -0.39]-0.25 [-0.47, -0.02] |
| 3: Education in yearsScreenerEducationeducation x screener | -5.54 [-6.00, -5.08]0.39 [0.32, 0.46]0.15 [0.12, 0.19] |
| 4: DiagnosisScreenermciad dementiaftddlbvdppaOther dementiaOther neurologyppdmci x screenerad dementia x screenerftd x screenerdlb x screenervd x screenerppa x screenerOther dementia x screenerOther neurology x screenerppd x screener | -2.73 [-2.94, -2.52]-1.37 [-1.94, -0.80]-6.98 [-7.42, -6.55]-3.96 [-4.88, -3.04]-5.07 [-5.88, -4.26]-4.08 [-5.22, -2.94]-2.66 [-3.78, -1.54]-3.81 [-4.85, -2.77]-1.65 [-2.44, -0.87]-2.30 [-2.84, -1.76]-0.97 [-1.35, -0.58]-1.59 [-1.88, -1.30]-2.16 [-2.77, -1.55]-1.83 [-2.37, -1.29]-1.87 [-2.63, -1.11]-2.54 [-3.29, -1.79]-1.16 [-1.85, -0.47]-0.74 [-1.26, -0.22]-1.05 [-1.41, -0.68] |

|  |  |
| --- | --- |
| Model | B [95%CI] |
| 5: EverythingScreenerAgeAge x screenerSexSex x screenerEducationEducation x screenermciad dementiaftddlbvdppaOther dementiaOther neurologyppdmci x screenerad dementia x screenerftd x screenerdlb x screenervd x screenerppa x screenerOther dementia x screenerOther neurology x screenerppd x screener | -3.52 [-4.47, -2.57]0.01 [-0.01, 0.03]-0.01 [-0.03, -0.00]-0.34 [-0.66, -0.03]-0.16 [-0.38, 0.05]0.35 [0.28, 0.39]0.14 [0.10, 0.18]-1.52 [-2.08, -0.96]-6.82 [-7.24, -6.39]-3.85 [-4.73, -2.96]-5.22 [-6.01, -4.42]-3.88 [-4.99, -2.78]-2.44 [-3.53, -1.34]-3.43 [-4.43, -2.42]-1.37 [-2.12, -0.62]-1.83 [-2.36, -1.31]-0.93 [-1.31, -0.50]-1.46 [-1.80, -1.18]-2.08 [-2.69, -1.47]-1.71 [-2.25, -1.16]-1.63 [-2.39, -0.87]-2.16 [-2.91, -1.40]-0.94 [-1.63, -0.25]-0.63 [-1.15, -0.12]-0.87 [-1.24, -0.51] |

*Note:* The reference for screener was MMSE (i.e., showing estimate for MoCA); the reference for diagnosis was SCD (i.e., showing each diagnosis compared to SCD).

*Abbreviations:* AD, Alzheimer’s disease; B, estimate; DLB, dementia with Lewy bodies; FTD, frontotemporal dementia; MCI, mild cognitive impairment; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; PPA, primary progressive aphasia; PPD, primary psychiatric diagnosis; SCD, subjective cognitive decline; VD, vascular dementia; 95%CI, 95% confidence interval.

Supplemental Figure 1. Raw MMSE and equated MoCA scores (left, in blue), and raw MoCA and equated MMSE scores (right, in green).



Supplemental Figure 2. Item-level data from MMSE and MoCA, in the whole sample and by diagnostic group.

Bars extending left from the center represent scores of less than half the available points (e.g., <3 out of 5) and darker red shades represent fewer points; bars extending right from the center of the plot represent scores of more than half the available points (e.g., ≥3 out of 5) and darker shades represent more points. The total possible number of points is displayed in each item header.

*Abbreviations:* AD, Alzheimer’s disease; FTD, frontotemporal dementia; DLB, dementia with Lewy bodies; MCI, mild cognitive impairment; MMSE, Mini-Mental State Examination; MoCA, Montreal Cognitive Assessment; PPA, primary progressive aphasia; PPD, primary psychiatric disorder; pt(s)., point(s); SCD, subjective cognitive decline; VD, vascular dementia.