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| Table S1. Recruitment of study participants for evaluation with Miro version V.3 by study site and diagnostic group  |

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| **Study Site** | **Group** | **Count** | **Age mean(sd)** | **Age (range)** |
| 1 | HC | 31 | 70.5 (3.5) | 65-80 |
| 1 | aMCI | 1 | 69.0 (--) | 69 |
| 1 | naMCI | 5 | 75.0 (5.3) | 68-82 |
| 2 | HC† | 11 | 67.5 (4.6) | 61-76 |
| 2 | aMCI | 9 | 69.2 (4.3) | 65-76 |
| 2 | naMCI | 7 | 69.4 (4.6) | 65-76 |
| 3 | HC | 48 | 71.5 (5.3) | 64-82 |
| 3 | aMCI | 2 | 74.5 (2.1) | 73-76 |
| 3 | naMCI | 1 | 76.0 (--) | 76 |
| JHU | Affected | 15 | 66.1 (9.0) | 48-79 |
| JHU | aMCI | 9 | 72.4 (10.2) | 49-83 |
| JHU | naMCI | 4 | 67.8 (8.4) | 60-79 |

**aMCI** = amnestic mild cognitive impairment. **HC** = healthy controls. **MCI** = mild cognitive impairment. **naMCI** = nonamnestic mild cognitive impairment.

† A 61 year old healthy control was evaluated at study site 2 even though the protocol was to recruit study participants with ages 64-85 years. Excluding this study participant there are 10 controls from study site 2 with a minimum age of 64 and with mean and standard deviation of age 68.1(4.3) years.

Site 1

Northern California Research

3840 Watt Avenue, Building E

Sacramento, CA 95821

Site 2

IMIC Inc

18320 Franjo Rd

Palmetto Bay, FL 33157

Site 3

Meridien Research Corporate

1201 S. Orlando Avenue, Suite 362

Winter Park, FL 32789

Site JHU

Stroke Cognitive Outcomes & Recovery Lab

Johns Hopkins University

600 N. Wolfe St

Baltimore, MD 21287

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| Table S2. Concurrent validity of Miro V.2 vs. comparison neurocognitive tests |
| **Variable** | **Spearman** (95% CI) | **P-value** |
| Digit Span Backward: longest correct span | 0.60 (0.37, 0.76) | < 0.001*\*\*\** |
| Coding: total correct | 0.58 (0.34, 0.75) | < 0.001*\*\*\** |
| Design Fluency A: total correct | 0.58 (0.34, 0.75) | < 0.001*\*\*\** |
| Digit Span Forward: longest correct span | 0.49 (0.23, 0.68) | < 0.001*\*\*\** |
| Category Fluency: total correct | 0.49 (0.23, 0.68) | < 0.001*\*\*\** |
| Finger Tapping: avg taps dominant | 0.50 (0.21, 0.71) | < 0.001*\*\*\** |
| Phonemic Fluency: total correct | 0.42 (0.14, 0.63) |  0.004\*\* |
| Finger Tapping: avg taps nondominant | 0.36 (0.04, 0.61) |  0.027\* |
| *\*Significant at P < 0.05 \*\*Significant at P < 0.01 \*\*\*Significant at P < 0.001* |

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| Table S3. Comparison of Spearman and Pearson correlations for Concurrent Validity |  |  |
| **Variable** | **Spearman**(95% CI) | **P-value** |  | **Pearson**(95% CI) |  **P-value** |  |
|  |  |  |  |  |  |  |
| Digit Span Backward: longest correct span, touch | 0.68 (0.54, 0.79) | <0.001\*\*\*  | 0.70 (0.56, 0.80) |  <0.001\*\*\*  |
| Phonemic Fluency: total correct | 0.66 (0.53, 0.75) | <0.001\*\*\* | 0.66 (0.54, 0.76) |  <0.001\*\*\*  |
| Category Fluency: total correct | 0.66 (0.54, 0.76) | <0.001\*\*\* | 0.59 (0.46, 0.70) |  <0.001\*\*\*  |
| Digit Span Forward: longest correct span, touch | 0.57 (0.43, 0.69) | <0.001\*\*\* | 0.62 (0.49, 0.72) |  <0.001\*\*\*  |
| Iowa Trail Making Test Part B: total time | 0.59 (0.45, 0.71) | <0.001\*\*\* | 0.52 (0.36, 0.65) |  <0.001\*\*\*  |
| Design Fluency A: total correct | 0.48 (0.31, 0.63) | <0.001\*\*\* | 0.55 (0.39, 0.68) |  <0.001\*\*\*  |
| Iowa Trail Making Test Part A: total time | 0.52 (0.37, 0.65) | <0.001\*\*\* | 0.43 (0.26, 0.58) |  <0.001\*\*\*  |
| Coding: total correct | 0.40 (0.21, 0.57) | <0.001\*\*\* | 0.40 (0.21, 0.56) |  <0.001\*\*\*  |
| Finger Tapping: mean taps nondominant | 0.35 (0.15, 0.52) | <0.001\*\*\* | 0.26 (0.06, 0.44) |  0.013\*  |
| Spatial Span Backward: total correct | 0.33 (0.15, 0.50) | <0.001\*\*\* | 0.41 (0.23, 0.56) |  <0.001\*\*\*  |
| Finger Tapping: mean taps dominant | 0.32 (0.11, 0.49) | 0.003\*\* | 0.27 (0.06, 0.45) |  0.011\*  |
| VLM: largest correct set spoken | 0.30 (0.10, 0.47) | 0.004\*\* | 0.27 (0.06, 0.45) |  0.010\*  |
| DVLM free recall: largest correct set spoken | 0.36 (0.14, 0.55) | 0.002\*\* | 0.33 (0.10, 0.53) |  0.006\*\*  |
| DVLM free recall: total errors | 0.30 (0.07, 0.51) | 0.012\* | 0.12 (-0.12, 0.35) |  0.340  |
| Design Fluency B Switching: total correct | 0.28 (-0.02, 0.54) | 0.064 | 0.18 (-0.13, 0.46) |  0.250  |
| Spatial Span Forward: total correct | 0.27 (0.08, 0.45) | 0.005\*\* | 0.28 (0.09, 0.45) |  0.004\*\*  |
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| *VLM = Verbal Learning and Memory; DVLM = Delayed Verbal Learning & Memory**\*Significant at P<0.05 \*\*Significant at P<0.01 \*\*\*Significant at P<0.001* |  |

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| Table S4. Test-retest analysis of learning effects |
| **Variable** | **Trend**Avg (SD) | **Trend**p-value | **Progression** Avg (SD) | **Progression**p-value |
| Category Fluency: total correct | -0.019 (0.550) | 0.995 | -0.117 (1.774) | 0.990 |
| Choice reaction time: mean RT, complex | -0.286 (0.362) | 0.877 | -0.239 (1.435) | 0.974 |
| Choice reaction time: mean RT, simple | -0.411 (0.472) | 0.864 | 0.331 (1.420) | 0.964 |
| Coding: total correct | -0.089 (0.400) | 0.965 | 0.267 (1.570) | 0.973 |
| Design Fluency A: total correct | 0.100 (0.511) | 0.969 | -0.247 (1.424) | 0.973 |
| Design Fluency B Switching: total correct | 0.043 (0.315) | 0.978 | -0.131 (1.111) | 0.982 |
| Digit Span Forward: longest correct span, spoken | 0.061 (0.457) | 0.979 | -0.147 (1.716) | 0.987 |
| Digit Span Forward: longest correct span, touch | -0.018 (0.396) | 0.993 | -0.431 (1.226) | 0.945 |
| Digit Span Backward: longest correct span, spoken | -0.013 (0.574) | 0.997 | -0.462 (1.392) | 0.948 |
| Digit Span Backward: longest correct span, touch | 0.397 (0.287) | 0.786 | 0.833 (2.219) | 0.941 |
| VLM: largest correct set spoken | 0.036 (0.510) | 0.989 | 0.393 (1.254) | 0.951 |
| DVLM cued recall: total correct | -0.289 (0.236) | 0.810 | 0.654 (1.070) | 0.905 |
| DVLM cued recall: total errors | 0.125 (0.286) | 0.932 | 0.252 (1.746) | 0.977 |
| DVLM free recall: largest correct set spoken | 0.200 (0.515) | 0.939 | 0.191 (1.084) | 0.972 |
| DVLM free recall: total errors | 0.000(---) | 1.00 | 0.202(---) | 1.00 |
| Finger Tapping: mean taps dominant | -0.025 (0.458) | 0.992 | -0.431 (1.230) | 0.945 |
| Finger Tapping: mean taps nondominant | 0.002 (0.475) | 0.999 | -0.031 (1.080) | 0.995 |
| Finger Tapping: greatest taps dominant | -0.055 (0.552) | 0.984 | -0.633 (1.302) | 0.924 |
| Iowa Trail Making Test Part A: total time | -0.053 (0.320) | 0.974 | 0.540 (1.211) | 0.930 |
| Iowa Trail Making Test Part B: total time | -0.080 (0.316) | 0.960 | 0.202 (1.100) | 0.971 |
| Iowa Trail Making Test Part B: total correct | -0.004 (0.524) | 0.999 | -0.345 (1.897) | 0.972 |
| Phonemic Fluency: total correct | -0.060 (0.298) | 0.969 | -0.288 (1.060) | 0.957 |
| Picture Description: fundamental frequency | -0.128 (0.342) | 0.942 | 0.297 (1.040) | 0.955 |
| Picture Description: total number of content units | -0.117 (0.423) | 0.957 | 0.100 (1.129) | 0.986 |
| Picture Description: total prepositions | 0.159 (0.548) | 0.954 | -0.643 (1.580) | 0.936 |
| Spatial Span Forward: total correct | 0.029 (0.482) | 0.991 | 0.499 (1.516) | 0.949 |
| Spatial Span Backward: total correct | 0.035 (0.578) | 0.991 | -0.053 (1.959) | 0.996 |
| *The difference in the trend from assessment 2 to 3 minus the trend from assessment 1 to 2 is shown in Table S3 and is called, ‘progression’. Estimates of progression with their standard errors and p-values from a t-test for significance are included. VLM = Verbal Learning and Memory; DVLM = Delayed Verbal Learning and Memory.*  |

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| Table S5. Means, Standard Deviations, and Tests of Differences in Distribution of Miro Health Mobile Assessment Platform Variables in Healthy Control and aMCI subjects  |
| **Variable** | **HC**Avg (SD) | **aMCI**Avg (SD) | **Rank sum**p-value | **t-test**p-value |
| Category Fluency: total correct | 13 (5.0) | 4.1 (3.7) | <0.001\*\*\* | <0.001\*\*\* |
| Choice reaction time: average response time, complex | 3.5 (1.0) | 4.6 (1.1) | <0.001\*\*\* | <0.001\*\*\* |
| Choice reaction time: average response time, simple | 2.9 (0.9) | 4.1 (1.6) | <0.001\*\*\* | <0.001\*\*\* |
| Coding: total correct | 37 (11) | 21 (8.2) | 0.407 | <0.001\*\*\* |
| Design Fluency A: total correct | 14 (3.8) | 9.4 (3.7) | 0.073 | <0.001\*\*\* |
| Design Fluency Switching: total correct | 6.6 (2.3) | 4.3 (1.2) | 0.379 | 0.107 |
| Digit Span Forward: longest correct span, verbal | 6.4 (1.3) | 4.5 (1.7) | 0.940 | <0.001\*\*\* |
| Digit Span Forward: longest correct span, visual | 6.7 (1.3) | 5.1 (1.9) | <0.001\*\*\* | <0.001\*\*\* |
| Digit Span Backward: longest correct span, verbal | 4.7 (1.5) | 2.8 (1.3) | 0.472 | <0.001\*\*\* |
| Digit Span Backward: longest correct span, visual | 5.7 (1.3) | 2.2 (1.8) | 0.098 | <0.001\*\*\* |
| VLM: largest correct set spoken | 7.5 (5.0) | 4.9 (1.5) | 0.736 | 0.068 |
| DVLM cued recall: total correct | 8.0 (1.9) | 6.3 (2.5) | 0.454 | 0.075 |
| DVLM cued recall: total errors | 0.8 (1.1) | 0.8 (0.9) | 0.860 | 0.984 |
| DVLM free recall: largest correct set spoken | 4.2 (2.8) | 2.4 (0.8) | 0.161 | 0.077 |
| DVLM free recall: total errors | 0.0 (0.2) | 0.0 (0.0) | 0.436 | 0.618 |
| Finger Tapping: average taps dominant | 70 (23) | 51 (23) | 0.006\*\* | 0.001\*\* |
| Finger Tapping: average taps nondominant | 72 (32) | 52 (27) | 0.049\* | 0.015\* |
| Finger Tapping: greatest taps dominant | 87 (34) | 65 (33) | 0.042\* | 0.012\* |
| Iowa Trail Making Test Part A: total time | 16 (4.0) | 28 (8.7) | <0.001\*\*\* | <0.001\*\*\* |
| Iowa Trail Making Test Part B: total time | 87 (21) | 113 (14) | <0.001\*\*\* | <0.001\*\*\* |
| Iowa Trail Making Test Part B: total correct | 30 (2.4) | 19 (8.1) | <0.001\*\*\* | <0.001\*\*\* |
| Phonemic Fluency: total correct | 17 (5.0) | 8.3 (5.4) | <0.001\*\*\* | <0.001\*\*\* |
| Picture Description: fundamental frequency | 151 (29) | 152 (40) | 0.900 | 0.910 |
| Picture Description: total number of content units | 86 (27) | 50 (28) | <0.001\*\*\* | <0.001\*\*\* |
| Picture Description: total prepositions | 16 (6.1) | 7.6 (6.0) | <0.001\*\*\* | <0.001\*\*\* |
| Spatial Span Forward: total correct | 3.0 (0.9) | 2.5 (1.0) | 0.598 | 0.044\* |
|  Spatial Span Backward: total correct | 3.5 (1.1) | 2.4 (1.5) | 0.167 | 0.001\*\* |
| *VLM = Verbal Learning and Memory; DVLM = Delayed Verbal Learning and Memory**\*Significant at P<0.05 \*\*Significant at P<0.01 \*\*\*Significant at P<0.001* |