

Day-to-day Memory Fluctuations In MCI: Linking Subjective Concerns To Real-world Performance Using Mobile Cognitive Assessment0645

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INTRODUCTION

- Cognition fluctuates, yet these daily changes are poorly captured by traditional assessments.
- Cognitive ecological momentary assessment (EMA) can examine both average performance and variability in cognition in daily life.
- It remains unclear how everyday cognitive concerns relate to actual performance in daily life, highlighting the need for statistical methods to examine predictors of both average and variability in cognition.

METHODS

Participants: 97 adults aged 54 - 87 from San Diego, Dallas, and Miami

Cognitive status: 50 met Jak/Bondi criteria for MCI and 47 were classified as cognitively normal (CN) via traditional neuropsychological testing

EMA protocol: 30-day protocol completing EMA and NeuroUX cognitive EMA tests.

- **Subjective Cognitive EMA:** Cognitive concerns (i.e., forgetfulness, difficulty concentrating, and slowed thinking) were reported three times per day using Likert-type scales and averaged to form a cognitive concerns composite.
- **Objective Cognitive EMA:** The 18-word version of the Variable Difficulty List Memory Test was given 5 times. Instances of reported alcohol or cannabis use on EMA earlier that day were excluded.

Statistical Analysis: Person-specific mean levels and momentary deviations in cognitive concerns from those means were computed. Bayesian mixed-effect location-scale models (MELS) simultaneously examined predictors of average and variability in memory performance. Models adjusted for day and demographic variables associated with outcomes; interactions between MCI status cognitive concerns were tested and removed if non-significant.

Table 1. Demographic characteristics

	MCI (n=50)	CN (n=47)	p-value
Age	71.6 (7.6)	70.6 (6.4)	0.495
Sex (female)	30 (60.0%)	33 (70.2%)	0.291
Race/ethnicity (non-Hispanic white)	38 (76.0%)	38 (80.6%)	0.561
Years of education	16.0 (2.6)	16.2 (2.0)	0.639

Figure 1. Example of NeuroUX 18-word Variable Difficulty List Memory Test



Table 2. MELS Estimates

	Estimate	Error	95% CI
MEAN COGNITION			
Day	0.02	0.04	-0.05, 0.10
MCI Status (ref: CN)	-2.75	1.24	-5.22, -0.32*
Sex (ref: Male)	4.95	1.31	2.40, 7.56*
Average Cognitive Concerns	-0.23	0.80	-1.76, 1.36
Within-person Cognitive Concerns	0.81	0.91	-0.92, 2.60
VARIABILITY IN COGNITION			
Day	0.00	0.01	-0.01, 0.01
MCI Status (ref: CN)	0.65	0.23	0.20, 1.11*
Sex (ref: Male)	-0.13	0.12	-0.37, 0.10
Average Cognitive Concerns	0.12	0.07	-0.02, 0.26
Within-person Cognitive Concerns	0.14	0.22	-0.30, 0.59
MCI*Average Cognitive Concerns	-0.41	0.14	-0.69, -0.12*
MCI*Within-person Cognitive Concerns	-0.56	0.37	-1.28, 0.16

* Considered significant when 95% CI does not include zero.

RESULTS

For average performance:

- Being classified as MCI and male sex were associated with worse memory performance.
- Neither mean cognitive concerns nor momentary deviations were associated with average memory performance.

Variability portion of the model:

- Being classified as MCI was associated with greater intraindividual variability.
- A significant interaction indicated that, compared to the cognitively healthy group, greater average cognitive complaints were associated with less variability in the MCI group.

CONCLUSIONS

Key Takeaway: Greater average subjective cognitive concerns among individuals with MCI were associated with more stable, though poorer, performance. This suggests that people with MCI who endorse more cognitive concerns may have a more stable impairment memory profile.

Limitations & Future Directions: This pilot study had limited observations assessing memory. This study demonstrates the utility of cognitive EMA combined with advanced statistical modeling to provide novel insights into daily cognitive processes that are not detectable with a single assessment.

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