

Tracking Change: Leveraging a Digital App to Understand a Compensation and Brain Health Intervention for Subjective Cognitive Decline

Maureen Schmitter-Edgecombe¹, Hillary Aralis² Jacklyn Fox³, Samina Rahman¹, Catherine Luna¹, Sarah Tomaszewski Farias³

¹Washington State University, Department of Psychology ²UC Davis School of Medicine, Department of Public Health ³University of California, Davis, Department of Neurology



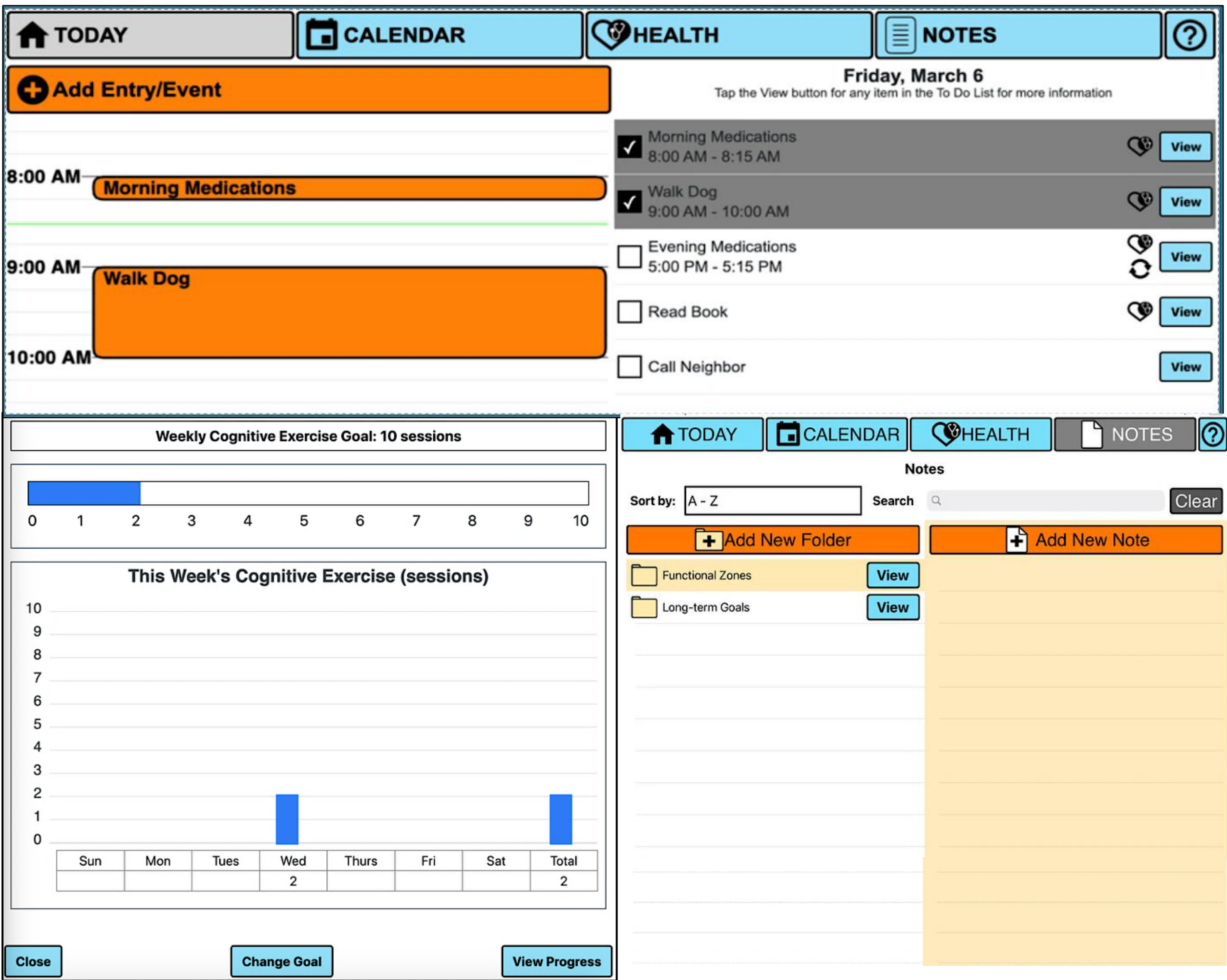
OBJECTIVE

- Optimizing multimodal brain health interventions for subjective cognitive decline (SCD) requires identifying which components drive outcomes.
- This study examined how adherence to compensatory (i.e., to-do list, calendar) and lifestyle (i.e., physical, cognitive/social, well-being) components of a multimodal, app-supported intervention relates to outcome changes in older adults with SCD.

METHOD

- Participants were 163 individuals age 65 or older with SCD in the structured intervention arm of a larger RCT (Farias et al., 2023)
- Participants were organized into 5 cohorts (10 groups; 14–22 per group) and received 16 in-person sessions: weekly ($n = 10$), biweekly ($n = 4$), and monthly (final 2).
- The EMMA app (Figure 1) facilitated compensatory and lifestyle strategies; component specific goals captured by the EMMA app are detailed in Table 1.
- Outcome measures included primary distal (cognition, everyday functioning) and secondary proximal outcomes aligned with intervention goals (Table 2).

Figure 1. Pages of the EMMA Application



Note. This figure displays the Today page (top), a graph within the Health page (bottom left), and the Notes page with predefined folders (bottom right).

RESULTS

- For the distal measures, greater adherence to specific goals was linked to differential cognitive improvements: daily to-do list adherence predicted gains in executive function, while cognitive activity and well-being adherence predicted improvements in episodic memory.
- For proximal measures, higher adherence to most goals was associated with increased physical and social activity, and well-being adherence was linked to greater use of compensatory strategies.
- No significant associations were found for processing speed, everyday functioning, cognitive activities or positive affect. See Table 2.

SUPPORT AND CONTACT: National Institute on Aging #R01 AG066748
Contact: schmitter-e@wsu.edu

Table 2. Model results from the regression of change score (6-month minus baseline) on: age, education, sex, cohort, adherence metric, and the value of the measure at baseline.

	Standardized Parameter Estimate				
	t-Value				
	Goal Adherence				
Outcomes	Calendar	To-Do	Physical	Cognitive	Well-being
Distal Measures					
Episodic Composite ($n = 160$)	0.11 1.65	0.07 1.05	0.05 0.71	0.17^c 2.47	0.14^c 1.99
Executive Composite ($n = 159$)	0.09 1.08	0.17^c 2.06	-0.06 -0.64	0.09 1.08	0.03 0.38
Processing Speed ($n = 160$)	-0.04 -0.57	-0.11 -1.44	-0.00 -0.04	-0.09 -1.20	-0.07 -0.92
Everyday Function ($n = 161$)	-0.02 -0.25	0.01 0.15	-0.03 -0.40	-0.07 -0.93	0.01 0.12
Proximal Measures					
CHAMPS Moderate Physical ($n = 162$)	0.16^c 2.08	0.04 0.57	0.27^b 3.36	0.25^b 3.18	0.24^b 3.03
CHAMPS Cognitive ($n = 162$)	0.04 0.78	0.00 0.08	0.01 0.28	0.06 1.30	0.03 0.70
CHAMPS Social ($n = 162$)	0.19^b 2.83	0.09 1.35	0.20^b 2.80	0.15^c 2.16	0.24^a 3.52
EComp ($n = 161$)	0.07 0.96	0.10 1.28	0.12 1.48	0.15 1.92	0.16^c 2.12
Positive Affect ($n = 163$)	-0.00 -0.06	0.05 0.76	0.10 1.42	0.09 1.28	0.05 0.66

Note: CHAMPS = Community Healthy Activities Model Program for Seniors; Ecomp = Everyday Compensatory Strategy Questionnaire ^a $p < .001$; ^b $p < .01$; ^c $p < .05$

CONCLUSIONS

- Digital adherence tracking can strengthen intervention delivery and evaluation by identifying which components are most strongly linked to meaningful outcomes.
- Higher overall adherence was associated with improvements in physical and social activity, while more differentiated, goal-specific relationships (especially for distal outcomes) suggest certain components may uniquely drive targeted changes; however, these findings are exploratory and require replication.
- Results support the potential for using adherence data to inform more personalized, adaptive interventions, and may, in future applications, help identify declines responsive to tailored nudges or automated boosters.