The California Face-Name Associative Memory Exam (C-FNAME)

Background: The Face-Name Associative Memory Exam (FNAME) is a sensitive measure of associative memory and age-related cognitive decline, with FNAME scores declining in parallel with increasing amyloid and tau burden in preclinical Alzheimer's disease (Rentz et al., 2011). Here we describe the California FNAME (C-FNAME), a fully automated, brief (8.8 min) computerized test designed for at-home administration under telemedical supervision.

Method:

PARTICIPANTS. The C-FNAME was remotely administered to 435 healthy adults (42.8% female, M=64.8, ±14.7) in their homes via tablet computer. Participants underwent two C-FNAME test sessions on successive days.

TECHNOLOGY. C-FNAME administration was automated, with instructions delivered using text-to-speech and responses scored with automatic speech recognition. Examiners monitored participant performance via video and audio feeds using a web-browser interface that displayed recall scores in real time.

TASK. Participants saw 6 faces with associated first names, last names, and occupations (encoding). Faces were presented individually, and participants repeated the names and occupations before the next face appeared. After each encoding trial, participants were asked to recall the associations when presented with the face alone (Figure 1a and 1b). After 30 minutes, participants saw the faces again one at a time and repeated the recall portion of the task (delayed recall).

Results: The C-FNAME showed excellent test-retest reliability ($r = 0.83$ for total recall scores, $r = 0.82$ for delayed recall scores). Multiple regression analysis revealed highly significant effects of age (Figure 2), education, gender, and vocabulary on total recall ($p < 0.001$ for all comparisons), with these variables aggregately accounting for 28.2% of variance. Performance significantly improved by 1.23 standard deviations on repeated testing ($p< 0.001$). As in previous FNAME studies (Papp et al., 2014), participants recalled occupations more accurately than names (Figure 3).

Conclusion: At-home computerized administration of the C-FNAME demonstrated excellent psychometric properties and produced results similar to those obtained with FNAME assessments administered in the laboratory.. The design of the C-FNAME allows for rapid, remote administration and scoring, which encourages the participation of populations that may be sometimes excluded from research protocols in laboratory settings.

Figure 1a. During encoding, participants heard and repeated first names, last names, and occupations while seeing an associated face. During recall (shown above) they were shown the face and asked to say the name and occupation out loud.

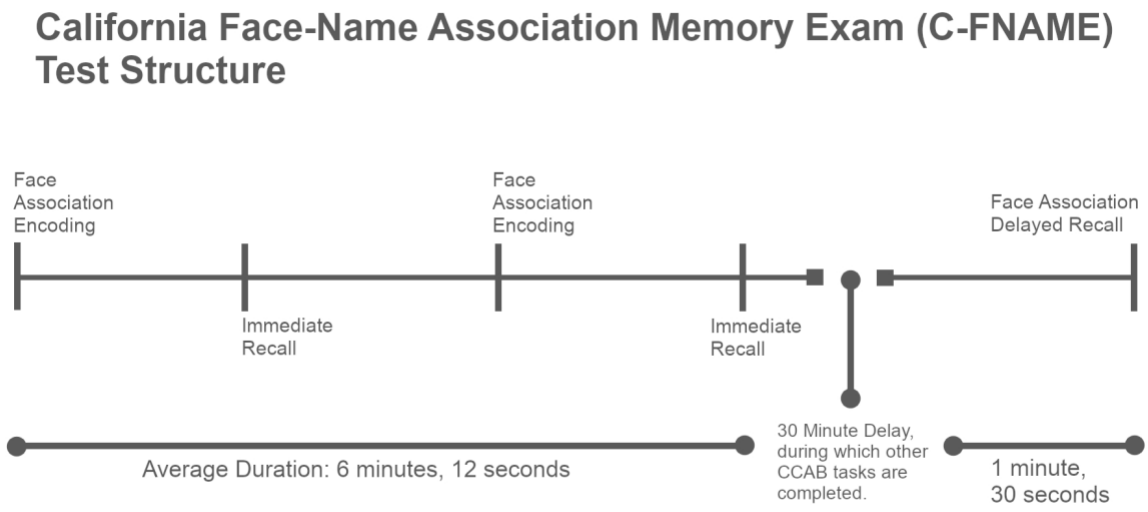

Figure 1b. Test structure and average durations of C-FNAME components. Participants underwent two encoding and immediate recall blocks. After a 30-min delay they were asked to recall the names and occupations of the faces they had previously seen.

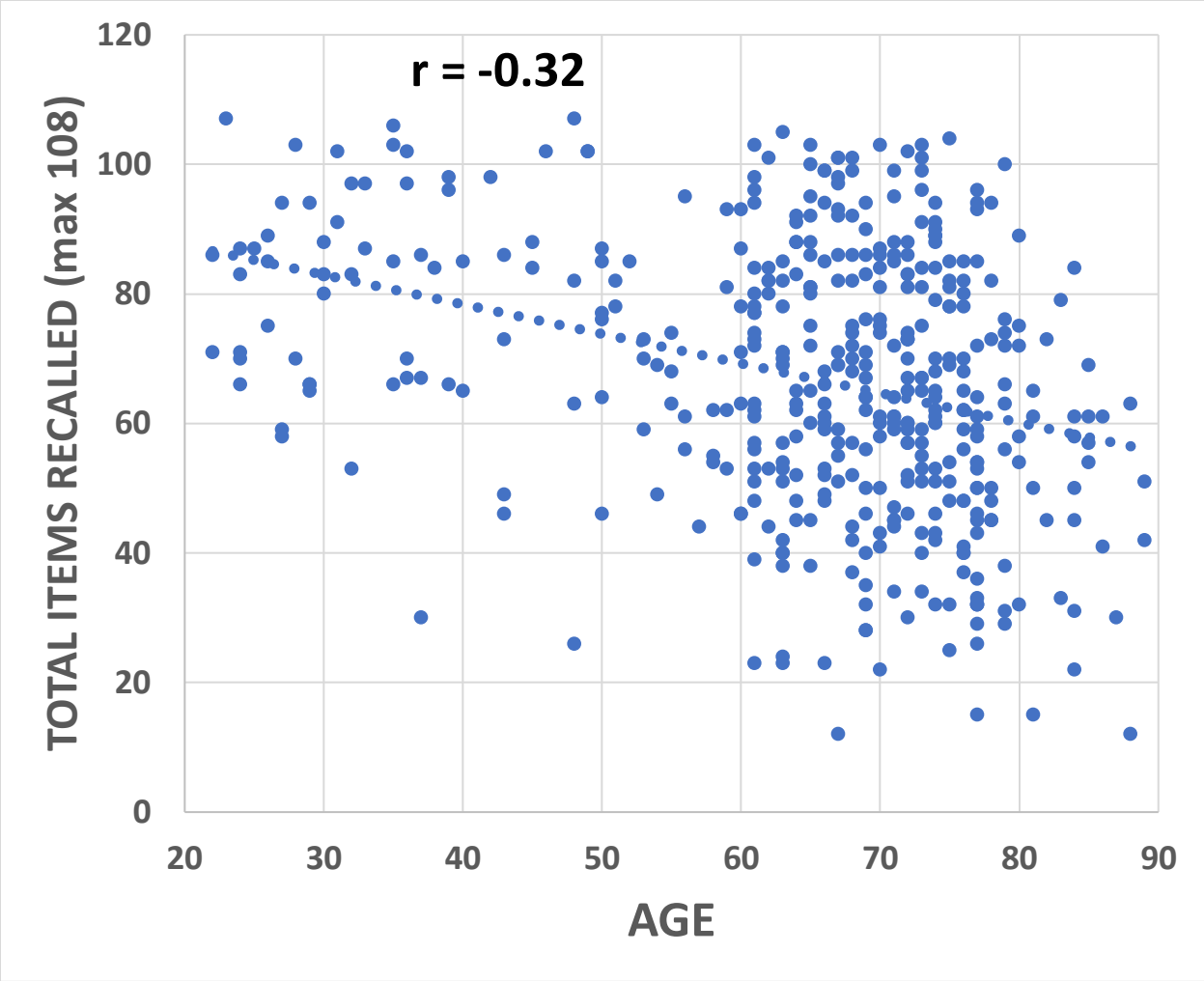

Figure 2. Total number of names and occupations correctly recalled, summed over list presentations and days, as a function of age.

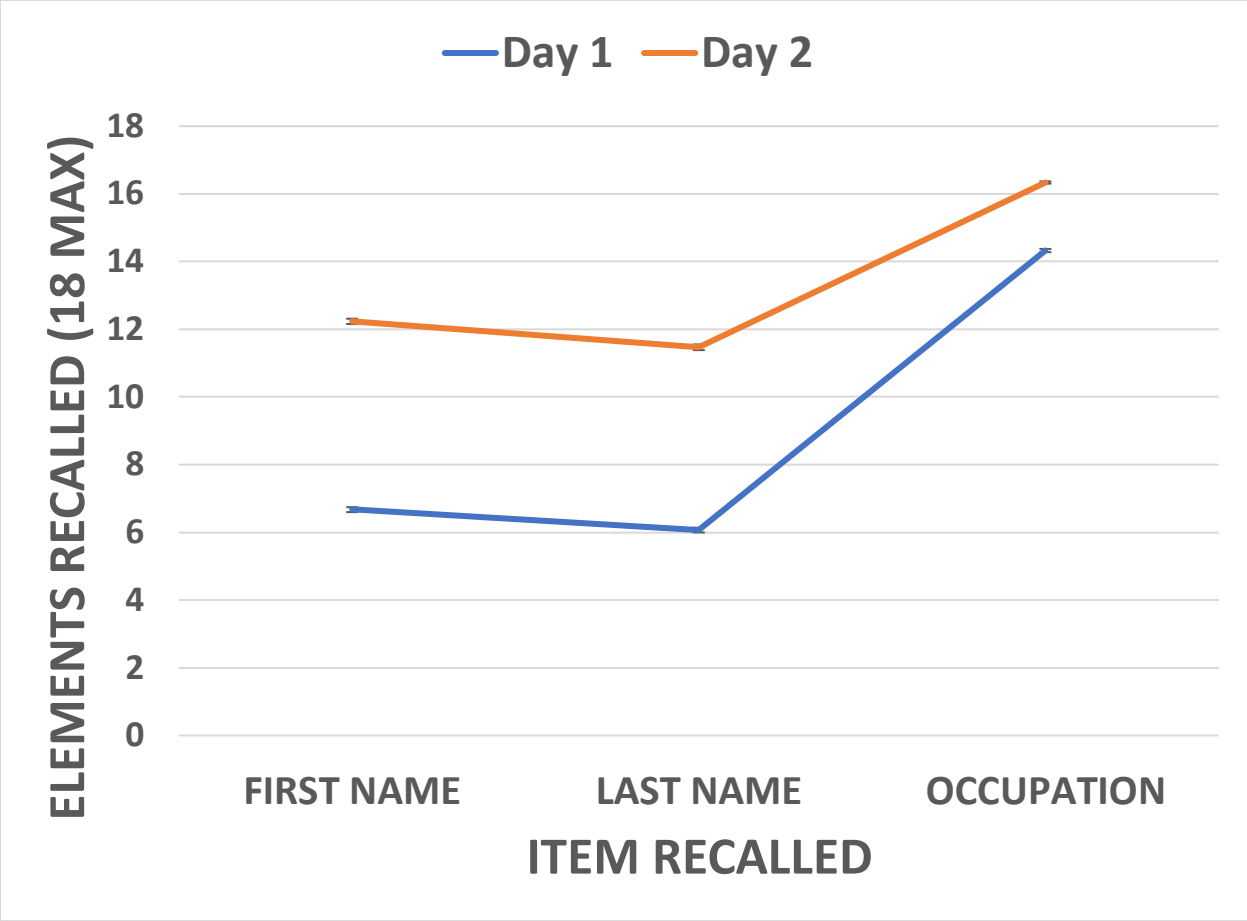

Figure 3. Learning effects. First names, last names, and occupations recalled over three list presentations on Day 1 and Day 2. Error bars show standard errors of the mean.