

Background

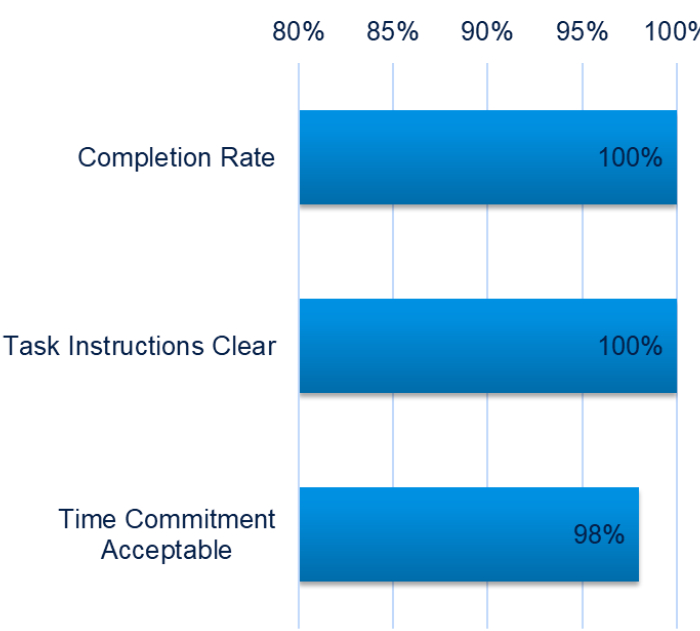
- Young-onset dementia is often underdiagnosed in diverse populations, highlighting the need for scalable, low-burden approaches to early detection.
- The ALLFTD Mobile App created on the Datacubed Health Platform offers a promising, accessible method to capture early cognitive changes in real-world settings.¹
- The Biomarker Evaluation in Young Onset Dementia from Diverse Populations (BEYONDD) study was designed to evaluate these tools alongside clinical and biological measures.

Methods

- Participants (N = 81) completed the ALLFTD Mobile App battery. Feasibility and acceptability were assessed via completion rates and in-app surveys.
- Flanker (executive function) scores were compared with gold-standard neuropsychological testing and subjective cognitive concerns.
- Subjective cognitive concerns were measured through a self-reported changes in memory, personality, and speech and summed for severity score
- A demographically matched normative sample from the Brain Health Registry (BHR).^{2,3}
- Associations with biological factors were examined, including vascular risk, and plasma biomarkers (A β 42/40).

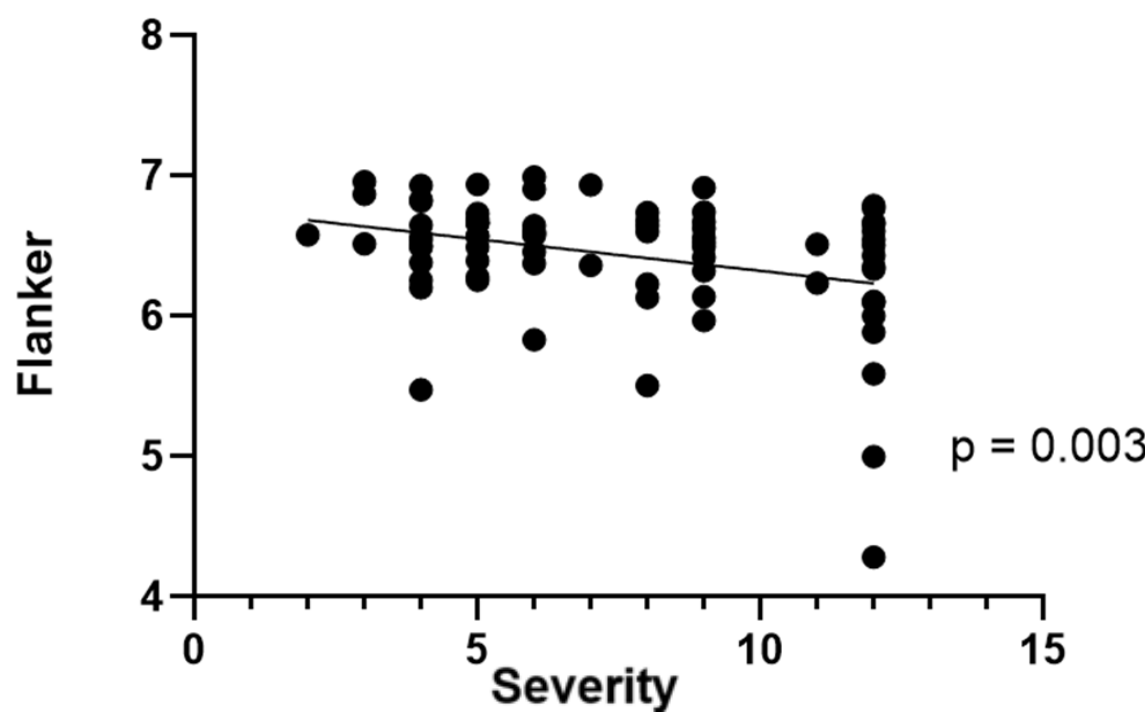
Demographics & Feasibility Results

	BEYONDD (N = 81)
Age (Mean (SD))	51.7 (6.6)
Sex (N (%))	
Female	63 (77.8%)
Male	18 (22.2%)
Race (N (%))	
African American	36 (44.4%)
Asian	9 (11.1%)
Multiracial	14 (17.3%)
White	12 (14.8%)
Other	9 (11.1%)



Subjective Cognitive Concern

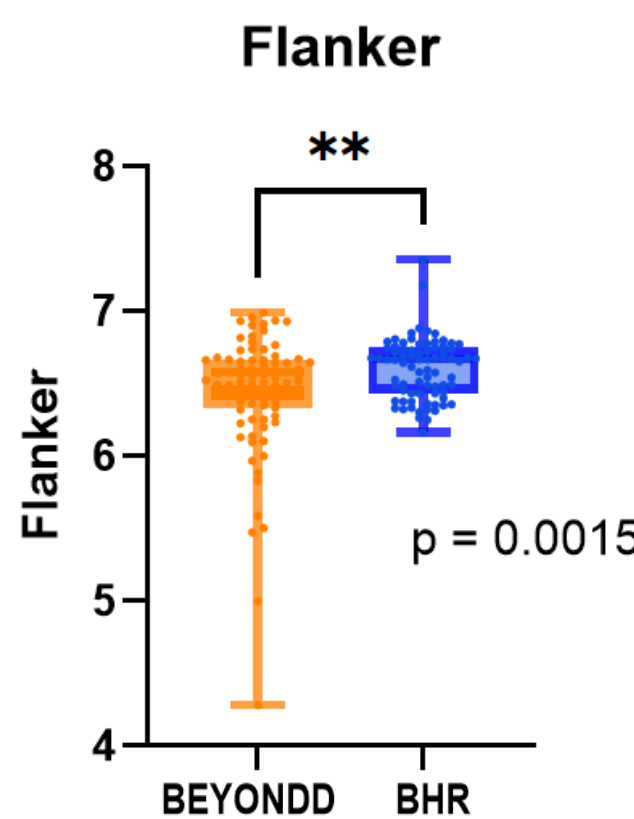
Results showed that there was a significant association with worse baseline Flanker score significantly correlated with increasing severity in subjective cognitive concern ($\beta = -0.29$, $p = 0.003$)



Normative Cohort Comparison

An age- and demographically matched cohort from the Brain Health Registry (BHR) was used as a normative comparison group.

The BEYONDD cohort demonstrated significant differences in cognitive performance in executive function and memory scores.

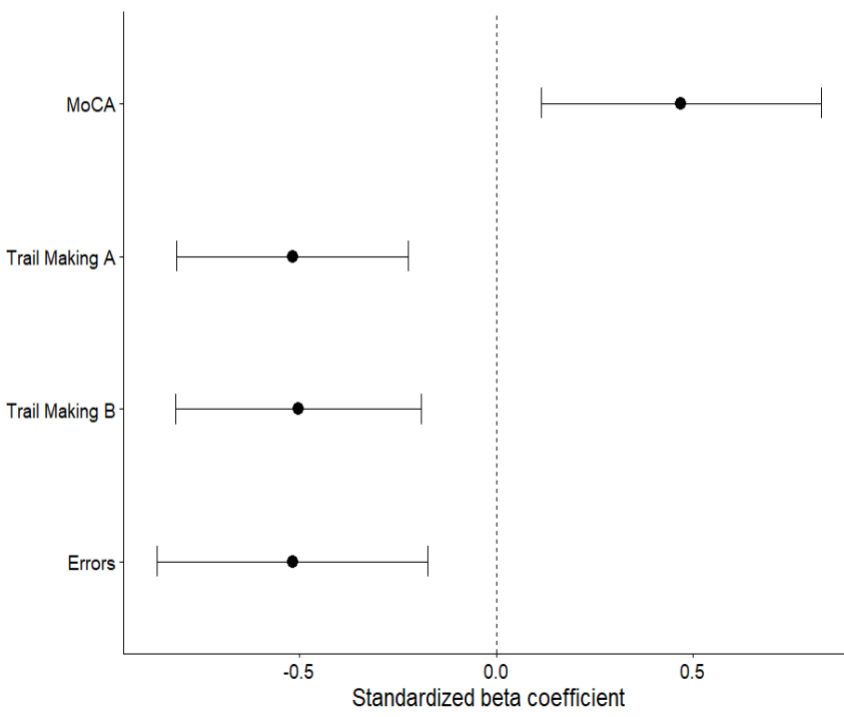


Higher Flanker scores also corresponded with better performance on gold standard measures of executive functioning (Trail Making Test Part B [$\beta = -0.50$, $p = 0.001$]).

Neuropsychological Validation

App-based Flanker scores correlated with gold-standard neuropsychological tests adjusted for age, sex, and education.

Significant associations with global cognition, processing speed, and executive function.



Discussion

- Smartphone cognitive assessments were feasible, acceptable, and sensitive to cognitive impairments in underrepresented backgrounds reporting early onset cognitive symptoms.
- Validity was supported by associations with gold-standard tasks, risk factors, and biomarkers.
- These provide preliminary support that remote assessments can reflect biologically relevant cognitive changes in underrepresented populations.

Contact

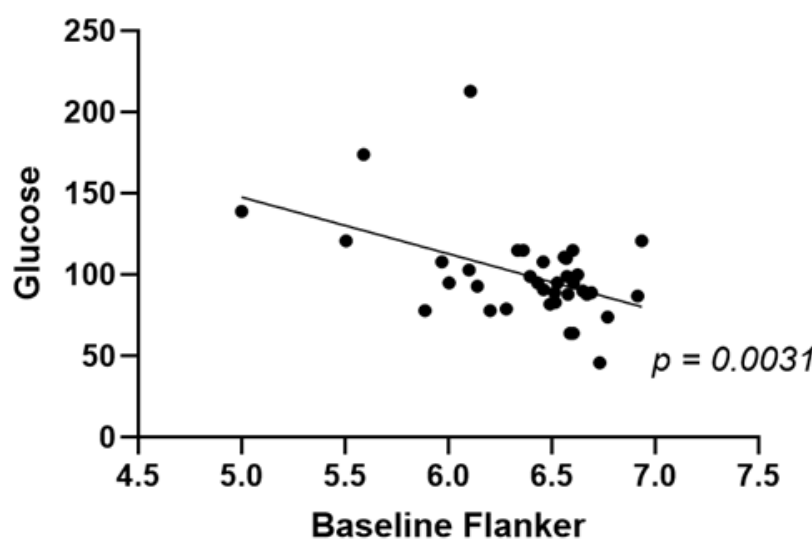
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References: 1. Staffaroni AM, Clark AL, Taylor JC, et al. Reliability and Validity of Smartphone Cognitive Testing for Frontotemporal Lobar Degeneration. JAMA Netw Open. 2024, doi:10.1001/jamanetworkopen.2024.4266
2. Weiner MW, Nosheny R, Camacho M, Truran-Sacrey D, Mackin RS, Flenniken D, Ulbricht A, Insel P, Finley S, Fockler J, Veitch D. The Brain Health Registry: An internet-based platform for recruitment, assessment, and longitudinal monitoring of participants for neuroscience studies. Alzheimers Dement. 2018 doi: 10.1016/j.jalz.2018.02.021
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Biological Associations

Executive function (Flanker) was correlated with blood tests. Measured values included vascular and dementia risk factors.

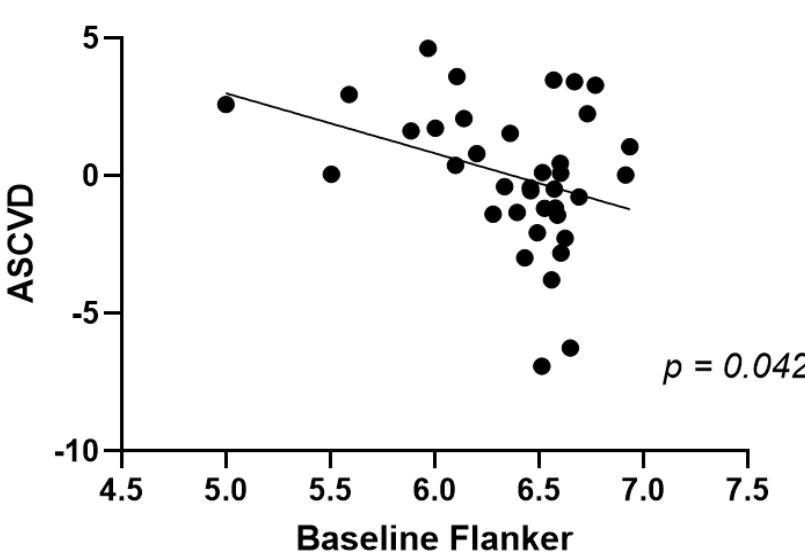
Fasting Glucose and Executive Function



Fasting Glucose

Higher fasting glucose also related to lower accuracy ($\beta = -0.44$, $p = 0.003$) and slower reaction time ($\beta = -0.44$, $p = 0.002$).

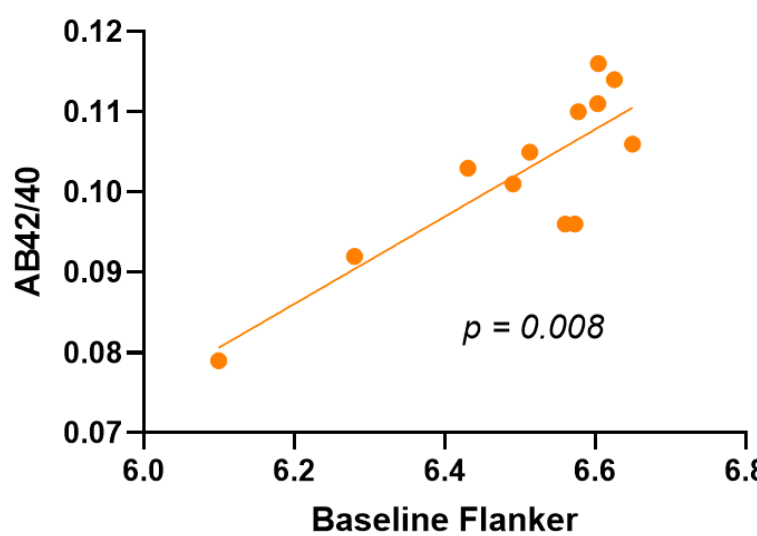
Proxy ASCVD and Executive Function



Proxy ASCVD Risk Score

Score was calculated based on Age, Cholesterol, Diabetes, Smoking, Hypertension, Statin use, Sex, and Race.

AB42/40 Low ASCVD Risk



AB42/40 Ratio

Lower A β 42/40 ratios (reflecting higher amyloid burden) were associated with worse smartphone-app executive function scores, particularly among individuals with low vascular burden (N = 12, $\beta = 0.70$, $p = 0.025$).