



# Becoming More Multimodal: Digital Voice

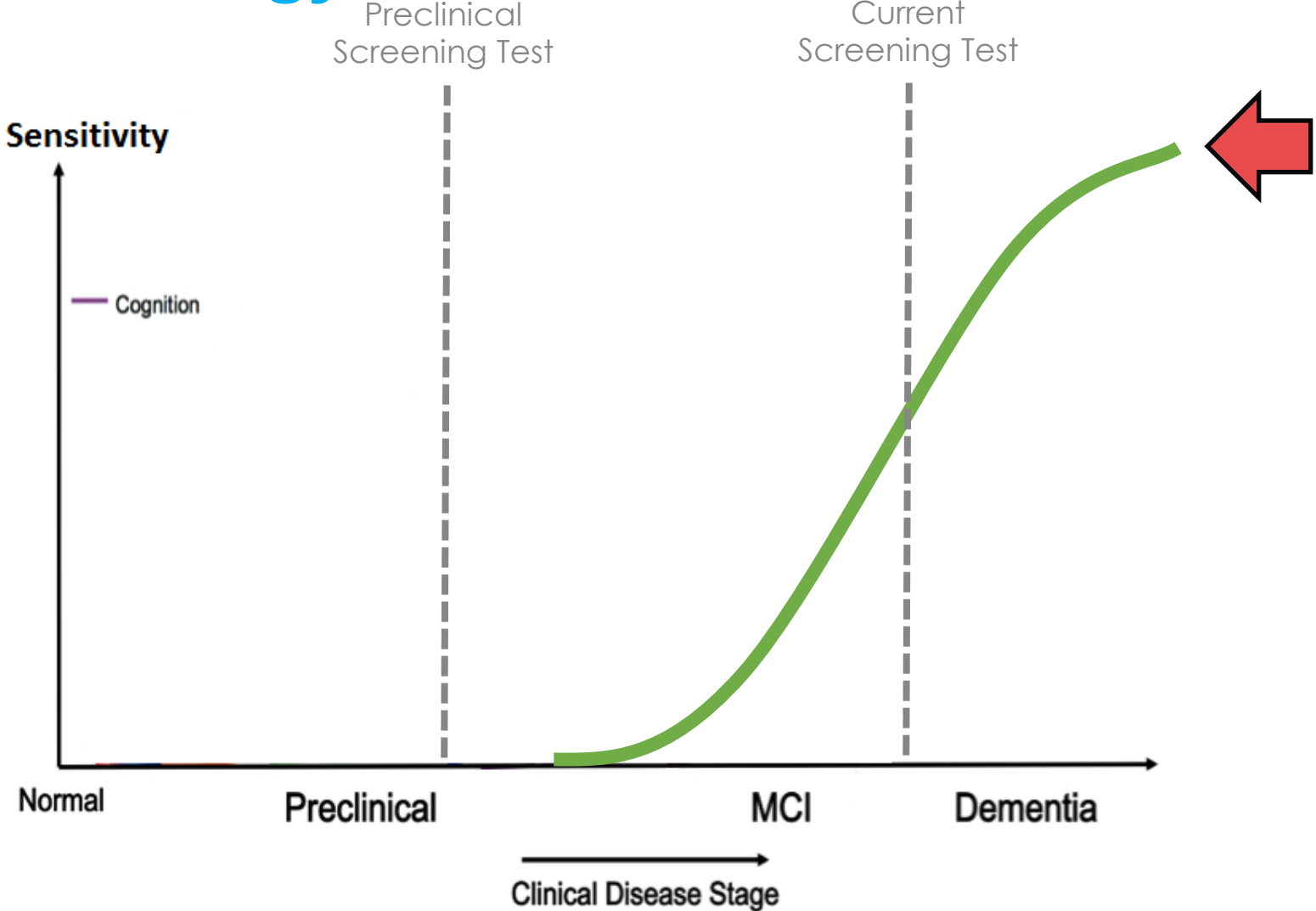
Rhoda Au, Ph.D.

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NACC Session, October 20, Fall 2023 ADRC Meeting

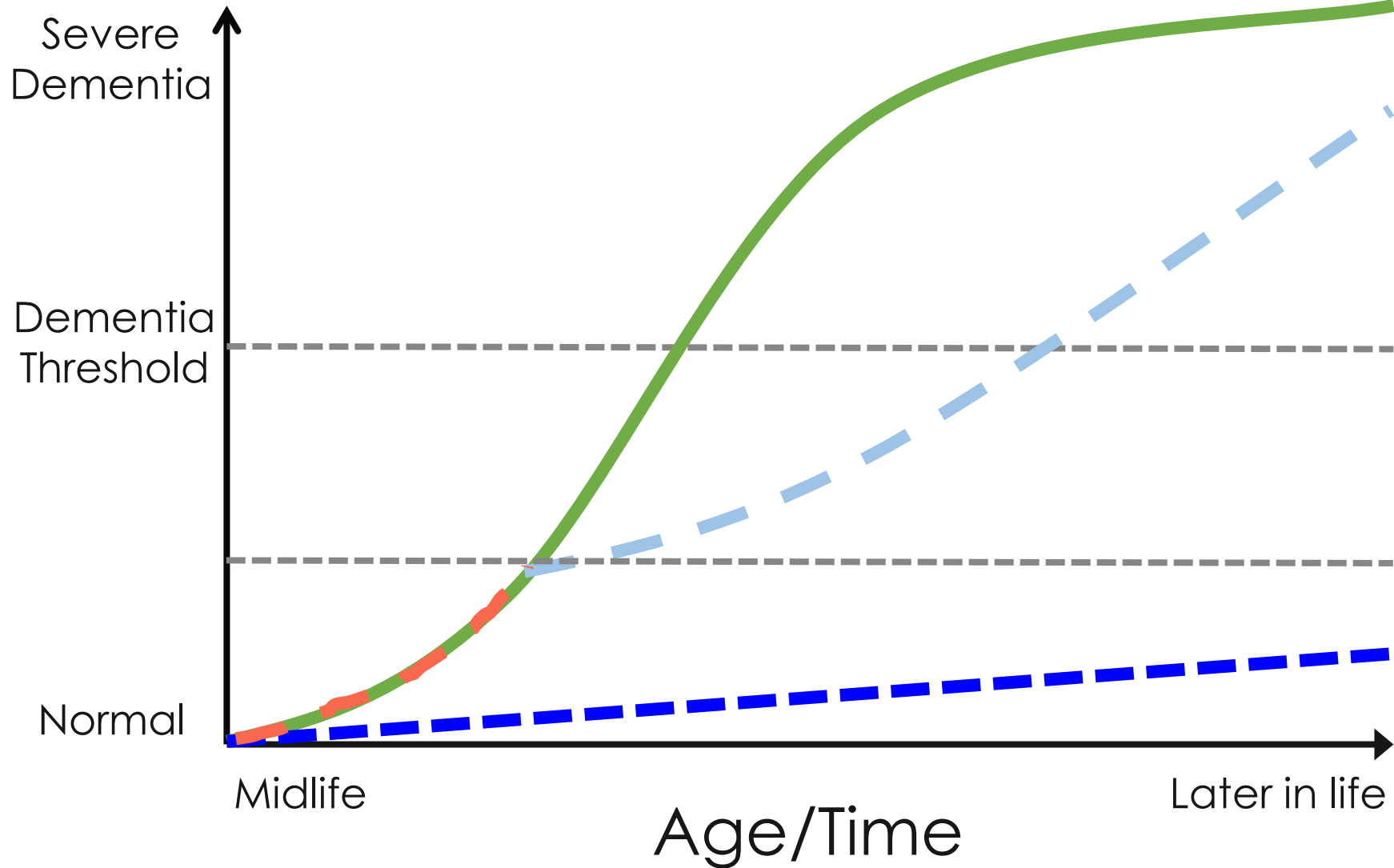
# Current Situation

## New Research Strategy



Adapted by Drs. Dana Penney and Randall Davis from Fig 3 of *Criteria For Preclinical Alzheimer's Disease*, Alzheimer's Association report (2010), which in turn cites Jack C R, et al., Hypothetical model of dynamic biomarkers of the Alzheimer's pathological cascade, *The Lancet*, 9:1, Jan 2010, pp 119-128.

# Potential Impact



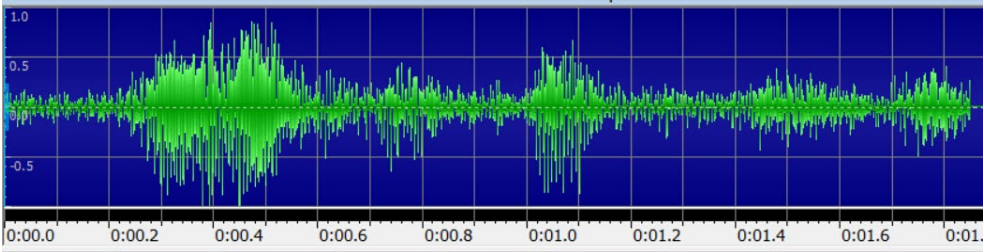
# Solving the Cognitive Change Detection Challenge

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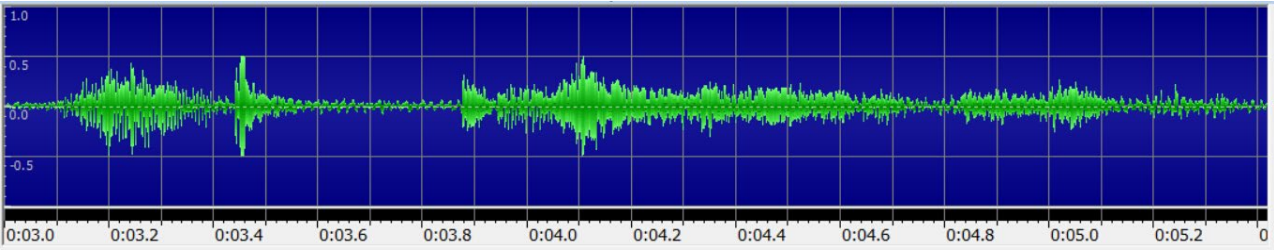
- The UDS Approach
- Boston Process Approach
  - Preserve traditional UDS measures
  - Expand test beyond single score
  - Focus on path to final response

# BPA on Steroids: Digital Voice

Not Demented: 2009

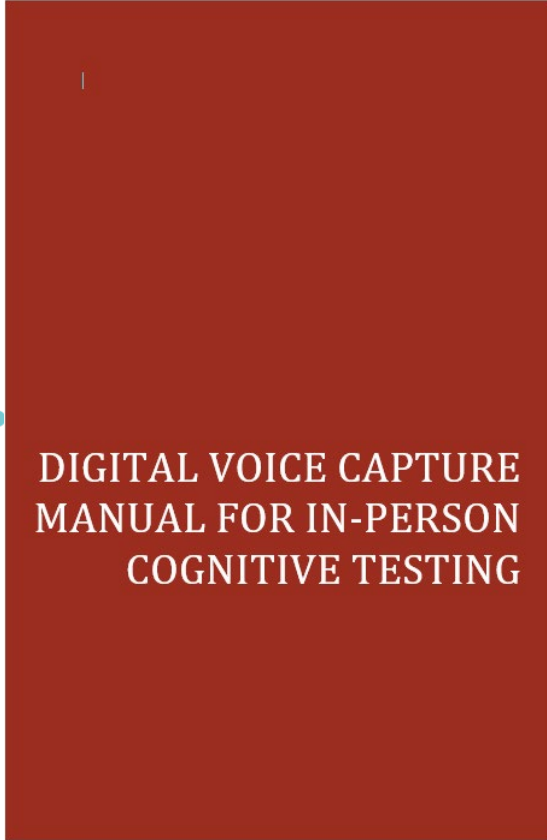


Mild Cognitive Impairment: 2015



# dVoice is Coming to UDS 4.0

- Cognition UDS 4.0



Sherral Devine, PhD  
Cody Karjadi, MS  
Hannah Craft, MPH



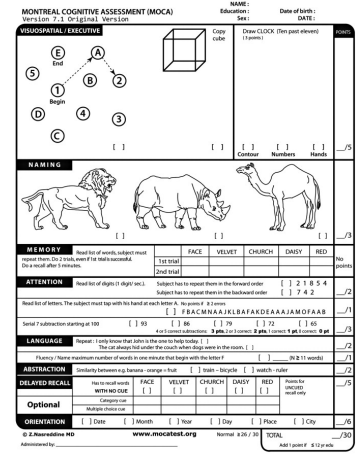
Sherral Devine



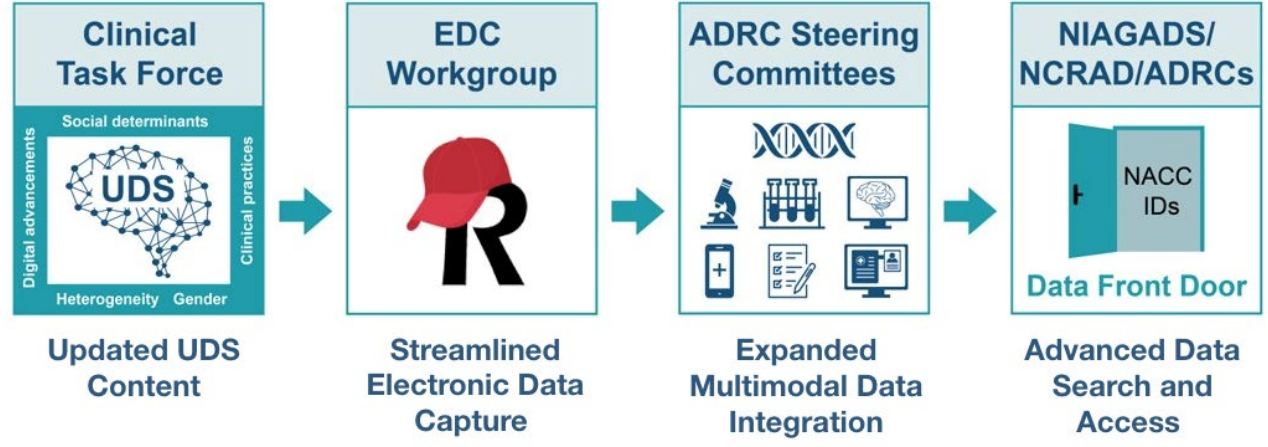
Hannah Craft



Cody Karjadi



- How you will start
- Recorder
- Local server
- Uploading to secure enclave



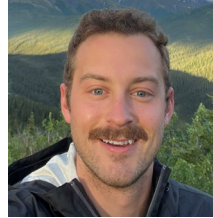


# Tech WG is Going to Help

## Tech WG- Parent Co-Leaders



Rhoda Au



Spencer Low

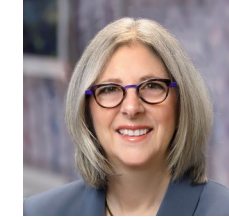


Sarah Biber

## Members (+Subcommittee Co-Leaders)



Alan Lerner



Nina Silverberg



Sean Mooney

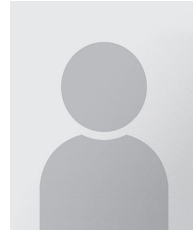
## In-clinic UDS digital instruments Co-Leaders



Kate Possin



Teresa Gomez-Isla



NACC TBD

## Members



Campbell Sullivan

## Telehealth (in-clinic) UDS instruments Co-Leaders



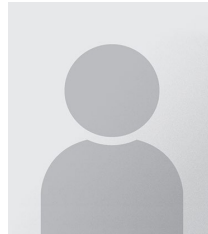
Hiroko Dodge



Sudeshna Das



Melissa Lamar

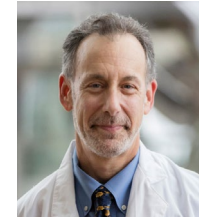


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Bonnie Sachs

## New non-UDS digital instruments Co-Leaders



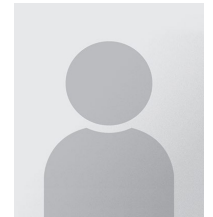
Jeff Kaye



Jason Hassenstab



Kate Papp



NACC TBD

## Members

## Members



Felicia Goldstein

# Digital Voice Collection & Processing Toolkit

Collection

Quality Control

Deidentification

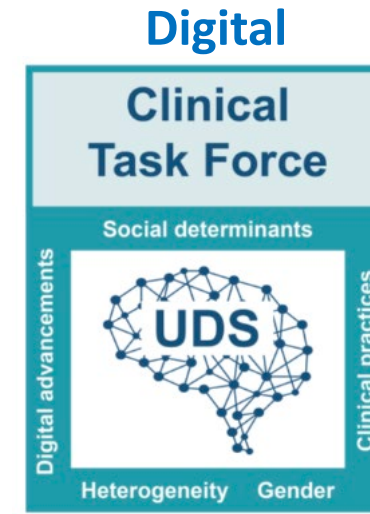
Sharing

Processing

Harmonization

ML Analysis

Epi-biostats Analysis



Boston University Alzheimer's Disease Research Center



# Operational Benefits

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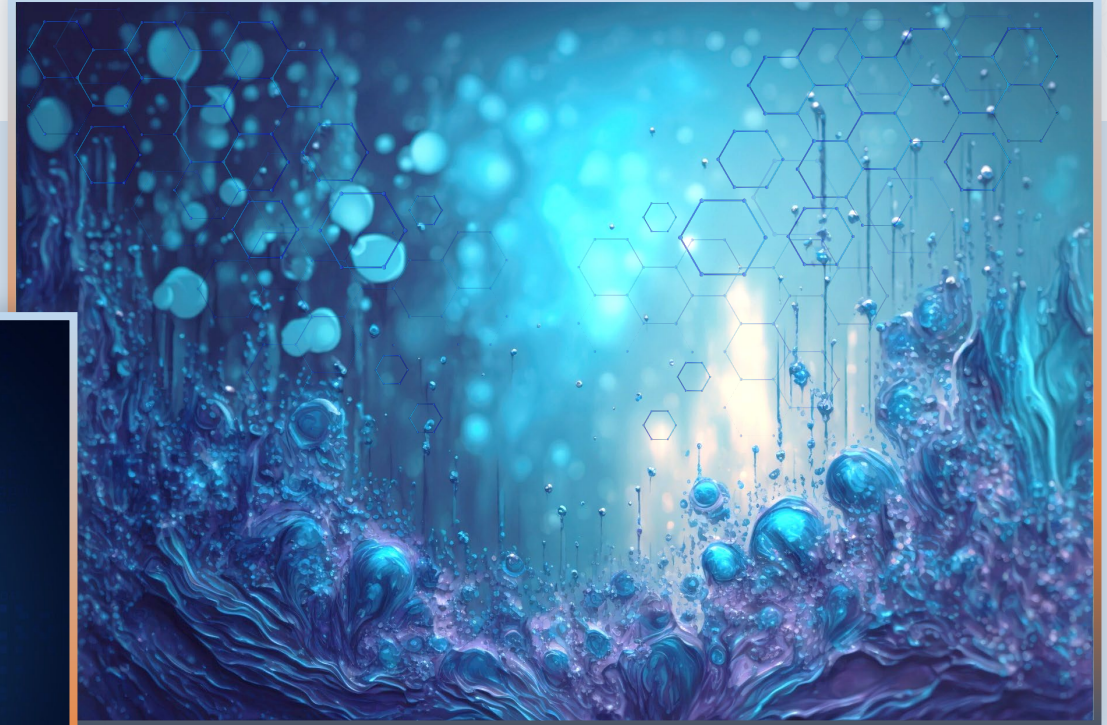
- Replicate Consent
- Quality Control
  - Test Administration
  - Scoring
- Re-create Test Session

# “Billy Beane” Effect

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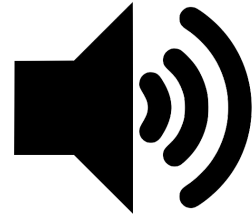


# Digital is the new blood





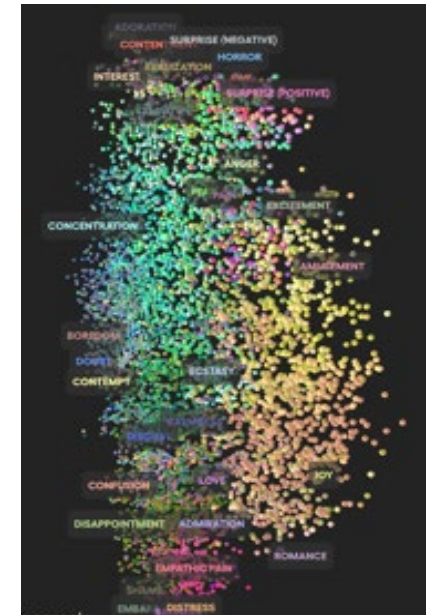
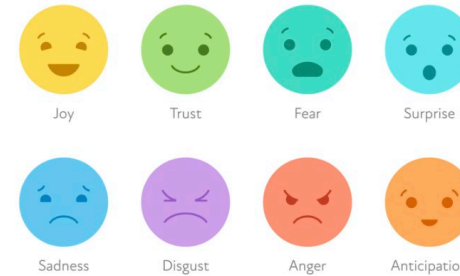
# Cognition and Mood Re-imagined



## Cognition

The 'Cognition' section features three smartphone screens and a central brain diagram. The first screen shows an 'Executive Function' test with a grid of letters (H, I, J, K, L, M, N, O, P, Q, R, S, T, U, V, W, X, Y, Z) and a path of green dots. The second screen displays 'Assessment Complete' with scores for Executive Function (97), Attention (36), Episodic Memory (67), Processing Speed (45), and Working Memory (88), along with an overall MyCO Score of 66. The third screen shows 'My Reports' with a radar chart for Attention, Processing Speed, Working Memory, and Episodic Memory. The brain diagram is surrounded by icons for a magnifying glass, laptop, lightbulb, smartphone, and various data charts.

## Mood/Mental Health



# Connect with BU Tech Team



Spencer Low  
Tech WG co-Lead  
splow@bu.edu



Visit Booth



Cody Karjadi  
FHS-BU Digital Tech Data Manager  
ckarjadi@bu.edu



# Thank you!







# Connect with Dr. Au

**Rhoda Au, Ph.D.**

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[rhodaau@bu.edu](mailto:rhodaau@bu.edu)