



Mood and Cognitive Assessment Across the Lifespan

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Disclosure

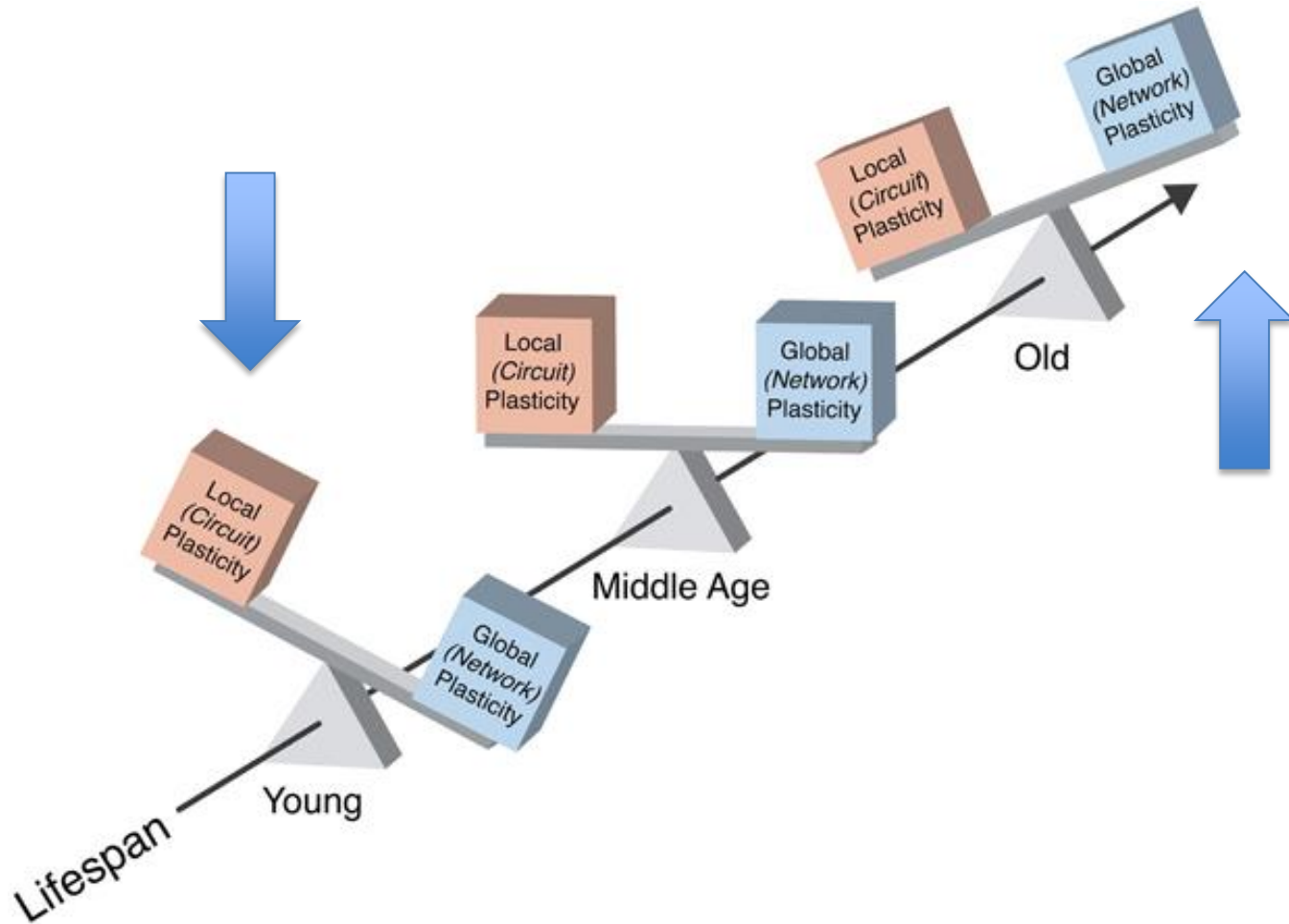
- All support from NIH

Overview

- Developmental issues in assessing mood;
- Outcomes of importance to focus on;
- Challenges with assessment;
- Solutions for overcoming challenges.



Plasticity over the life span



Current Status

- Variable and brittle response to medications;
- Not enough information about long term effects of behavioral interventions;
- Recruitment challenges leads to selected samples (diagnosis of MDD);
- Mood measures are usually age adjusted self-report or other-report instruments.

What we probably should be measuring

- Consumer Driven:
 - Better sleep;
 - Higher quality social contact;
 - Better concentration/focus;
 - Better health/ability to “do more”.
- Researcher Driven:
 - Executive functions
 - Attention bias
 - Reward anticipation, valuation and motivation

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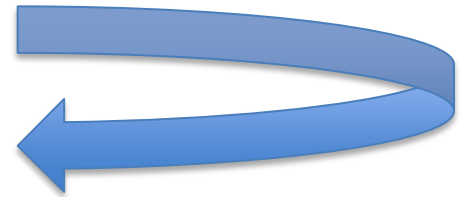
Importance of assessing cognition: Late Life

- Pretreatment EF associated with SSRI response;
- Residual EF impairments associated with poor response in all treatments;

A late life RCT that does not assess EF domains is an incomplete trial.

Assessment Challenges

- Reporting accuracy influenced by age;
- Changes in mood not always related to other outcomes;
- Assessment is burdensome and questionably accurate for lifespan;
- Impact of context on mood;
- Conflicting reports from “others”.

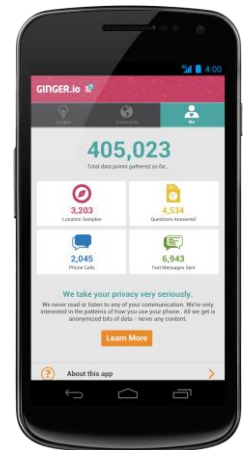
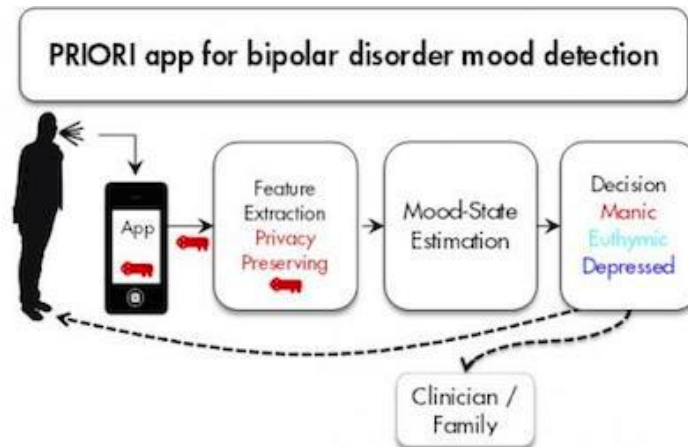




**SOLUTIONS & INNOVATIONS IN
MOOD ASSESSMENT ACROSS
LIFESPAN.**

Milieu based assessment

- Use of mobile technologies to deploy assessment in home;
- Monitor activity outcomes;



Ginger.io measures clinical indicators for behavioral health conditions



Movement data

- Physical isolation
- Lethargy / Restlessness



Screen usage data*

- Insomnia / Hypersomnia
- Restlessness
- Diminished interest in phone activities



Communication data*

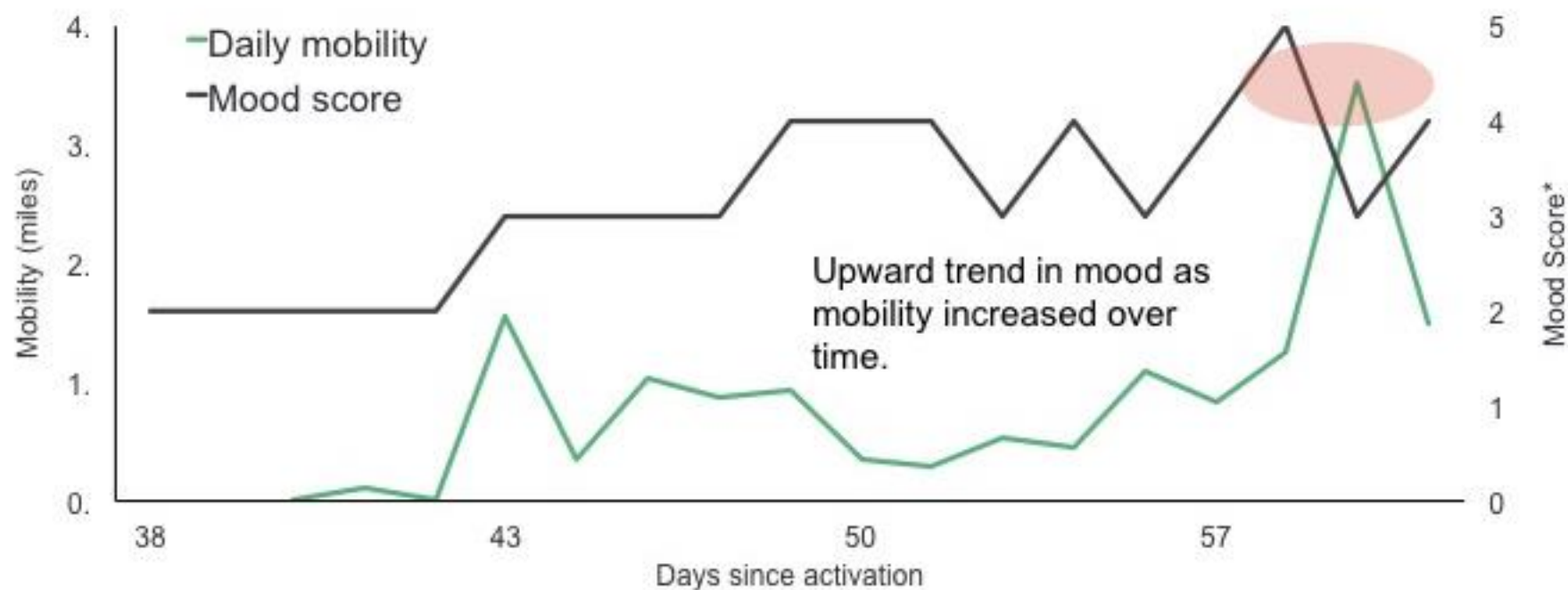
- Social isolation
- Support network outreach



Patient-reported outcomes data

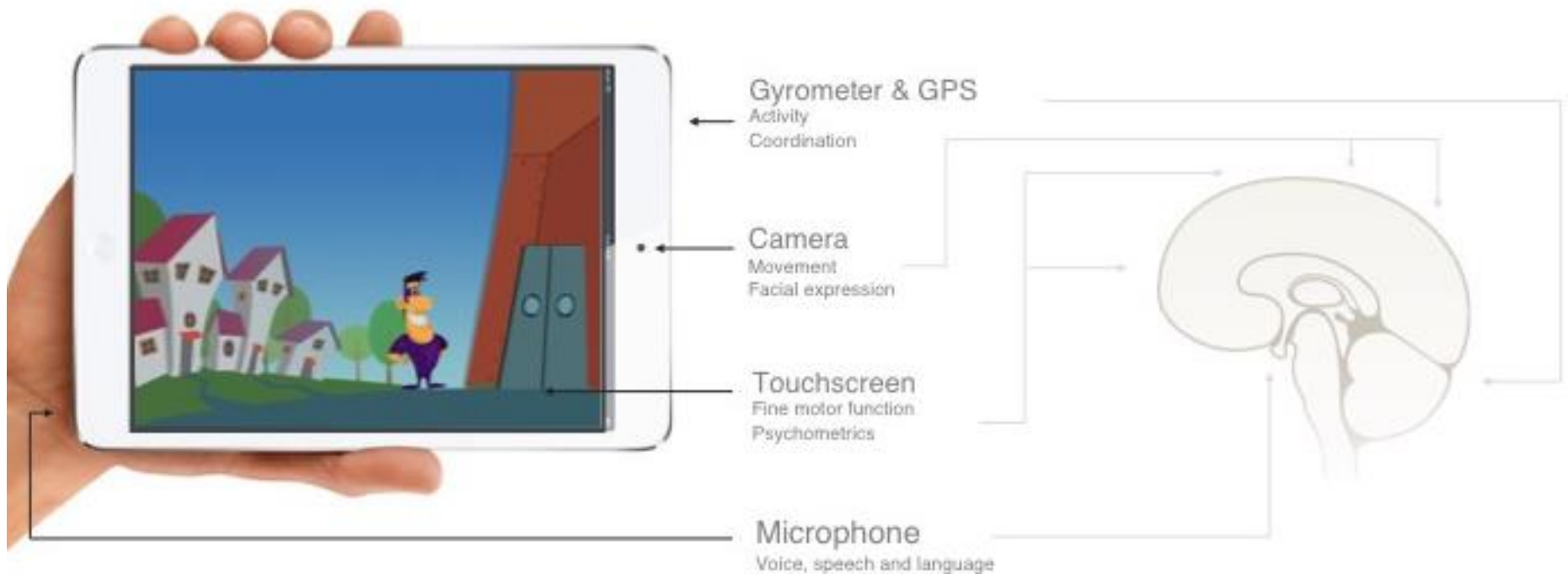
- Medication compliance
- Validated mood scores (e.g., PHQ-9)
- Anhedonia, guilt, suicidal ideations, irritability, et al.

Ginger.io helped care manager uncover a pattern between stress at home & low mobility



A modern approach to research

The old way of conducting research is dying. It's inefficient, costly, unscalable, and frankly, not fun for patients or docs. We're mashing up knowledge from gaming, experience design, technology and science to create experiences that take advantage of all the advances mobile devices have to offer.



Attention, reaction time & response inhibition

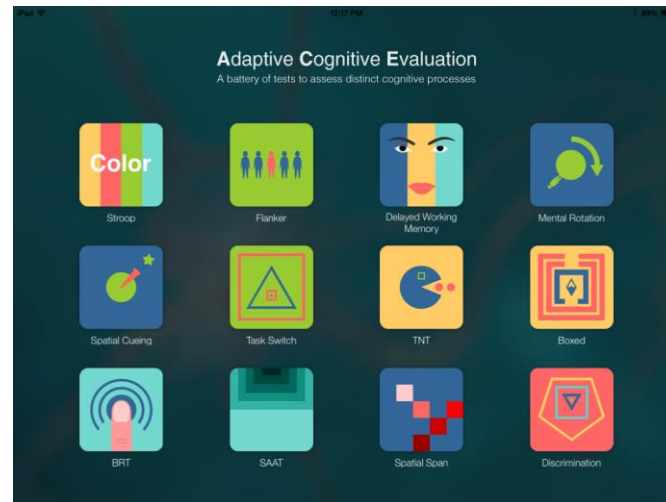


Learning & memory



Set shifting & visual search





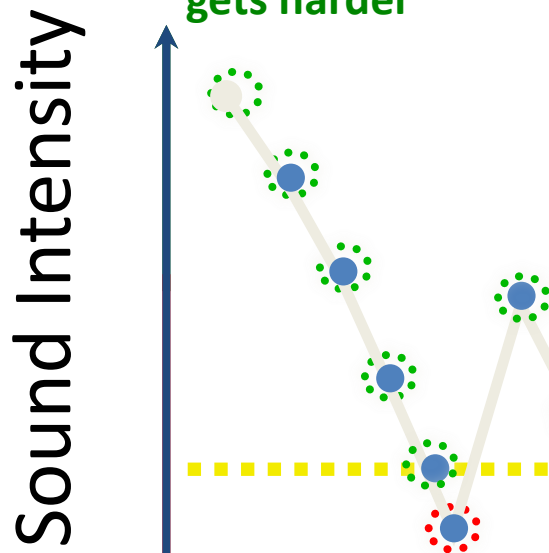
**A mobile way to assess
cognitive control in a quick,
fun, and robust fashion**

Adaptive Cognitive Evaluation

Based on Psychophysics
...like a hearing test



"Yes, I heard it" Correct!...so this
gets harder



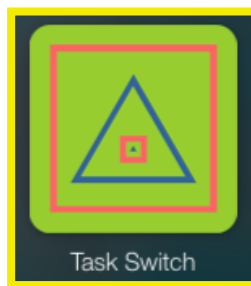
Wrong! Let's
make this easier

*"I didn't hear a
thing"*

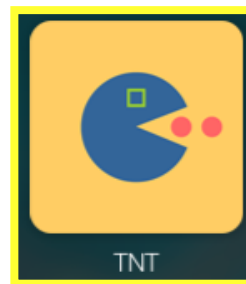
Trial / Time



Adaptive Cognitive Evaluation

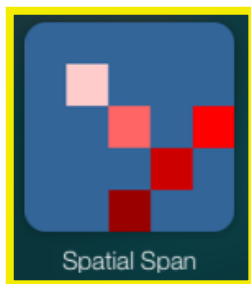


Task Switch

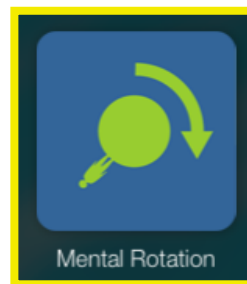


TNT

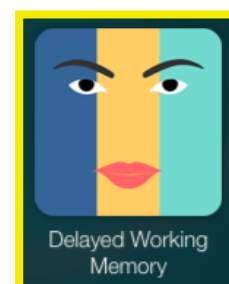
*Goal
Manageme
nt*



Spatial Span

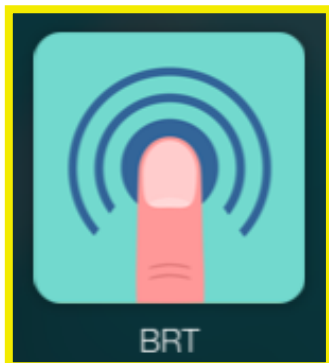


Mental Rotation



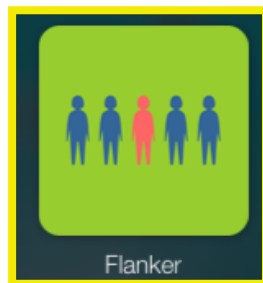
Delayed Working
Memory

*Working
Memory*

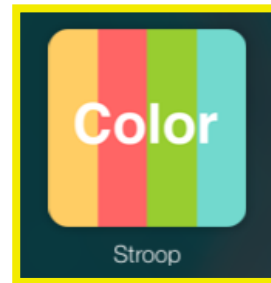


BRT

*Basic
Response
Time*

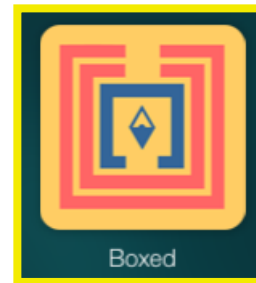


Flanker



Color

Stroop

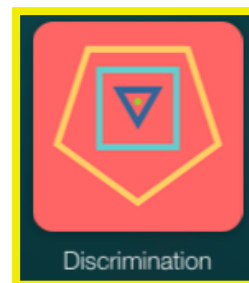


Boxed

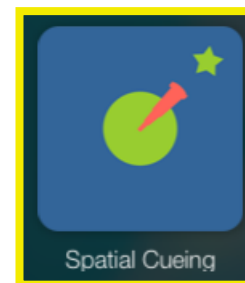
*Distracte
d
Attention*



SAAT



Discrimination



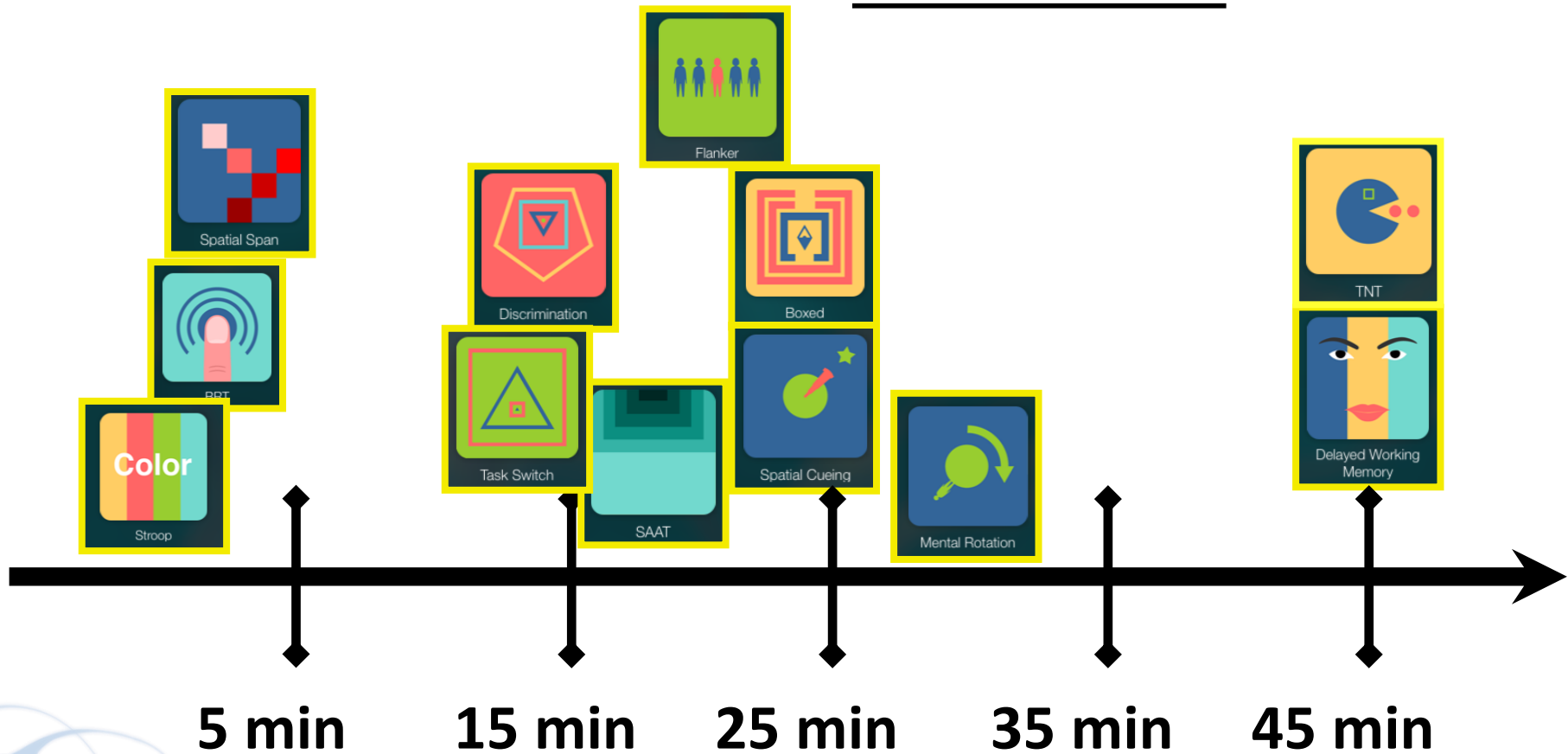
Spatial Cueing

*Directed
Attention*



Adaptive Cognitive Evaluation

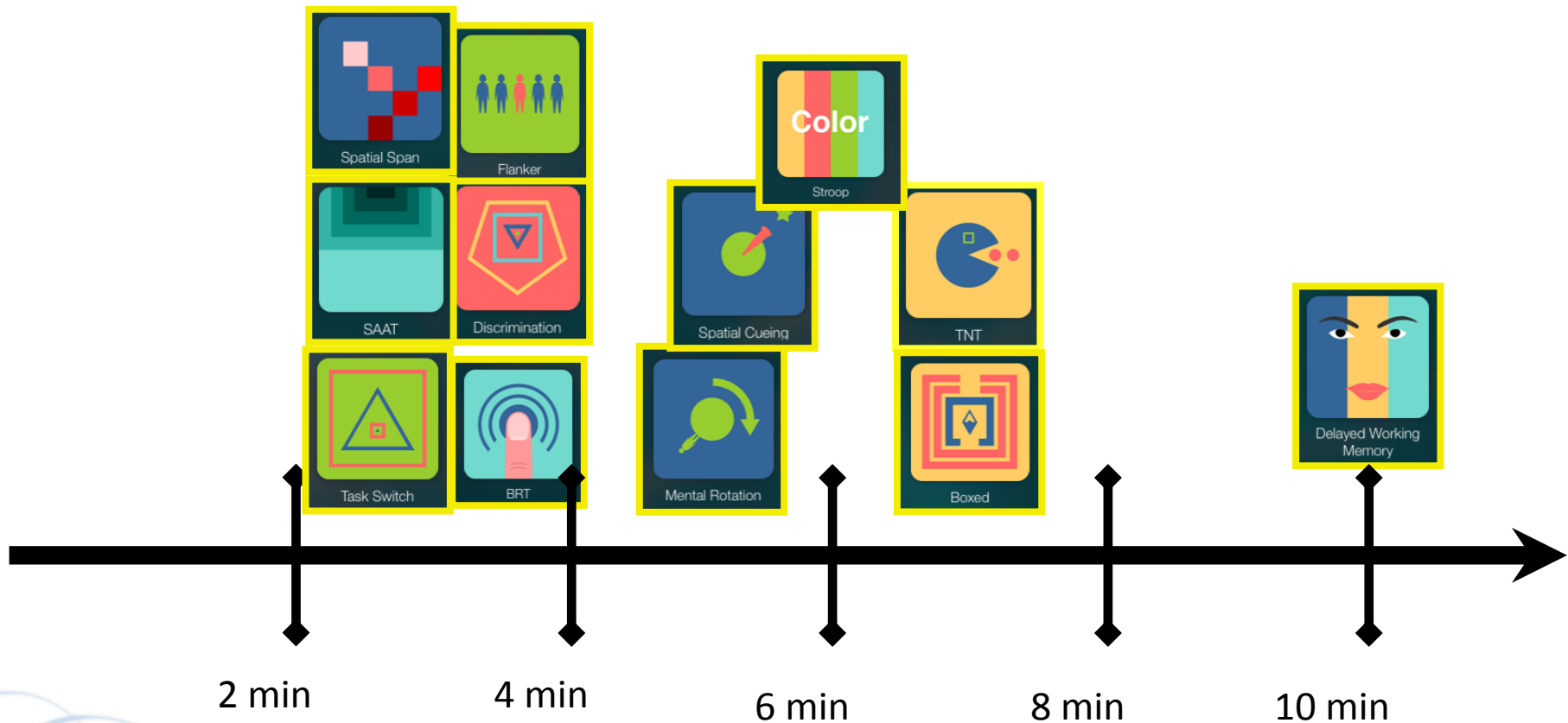
How long does
each task
USUALLY take?





Adaptive Cognitive Evaluation

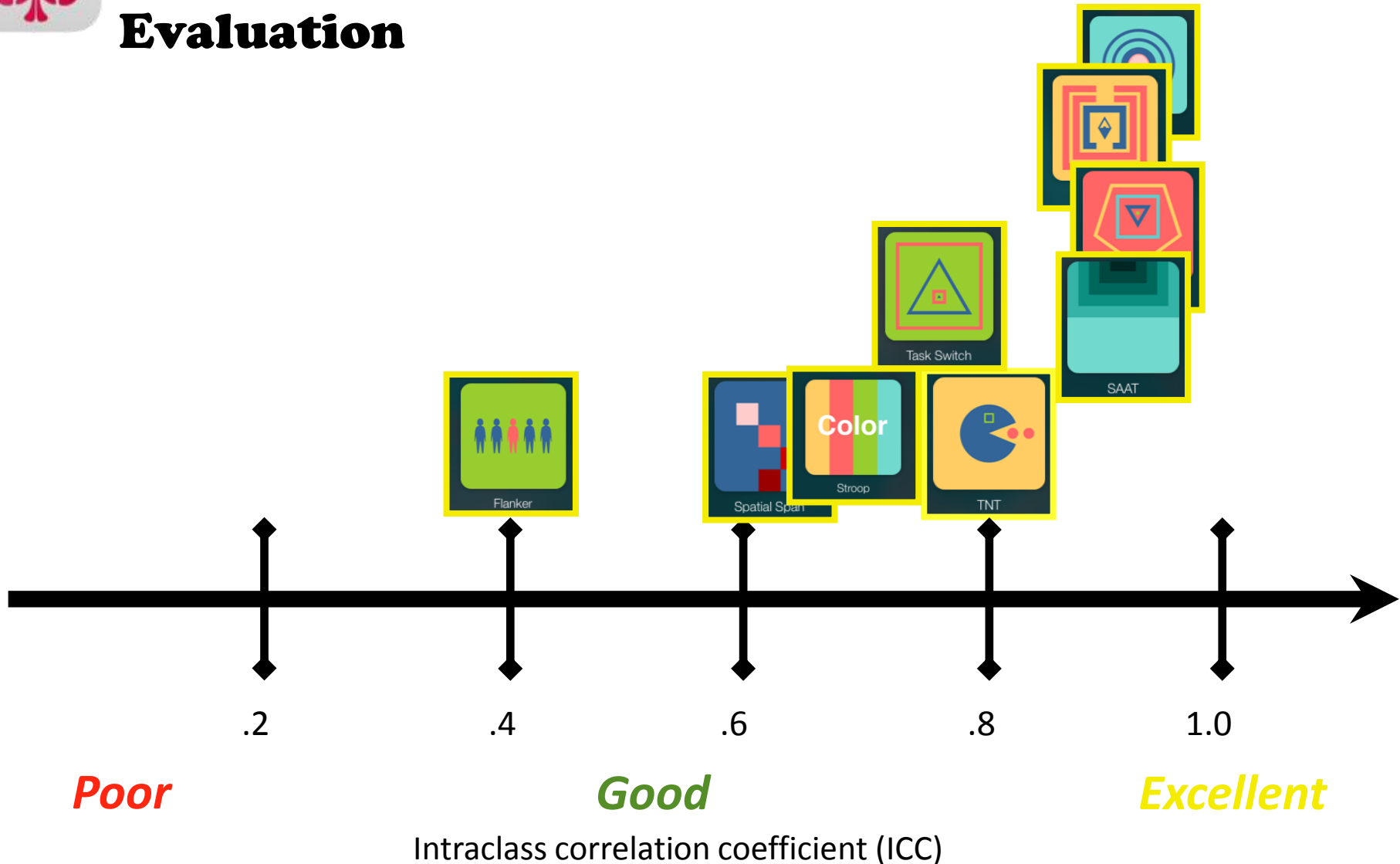
How *long* does
each task take?





Adaptive Cognitive Evaluation

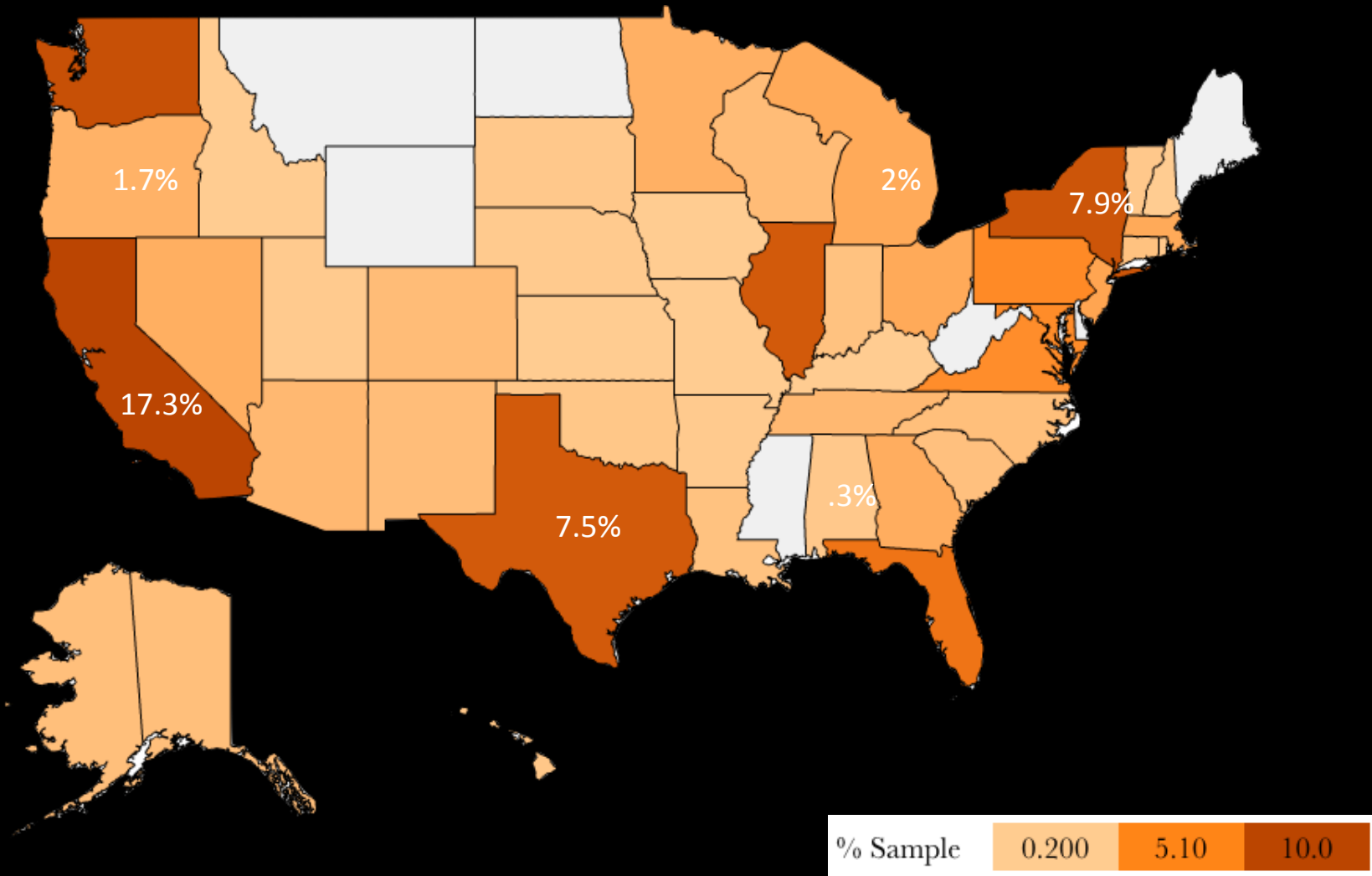
How *reliable* is performance on these tasks?



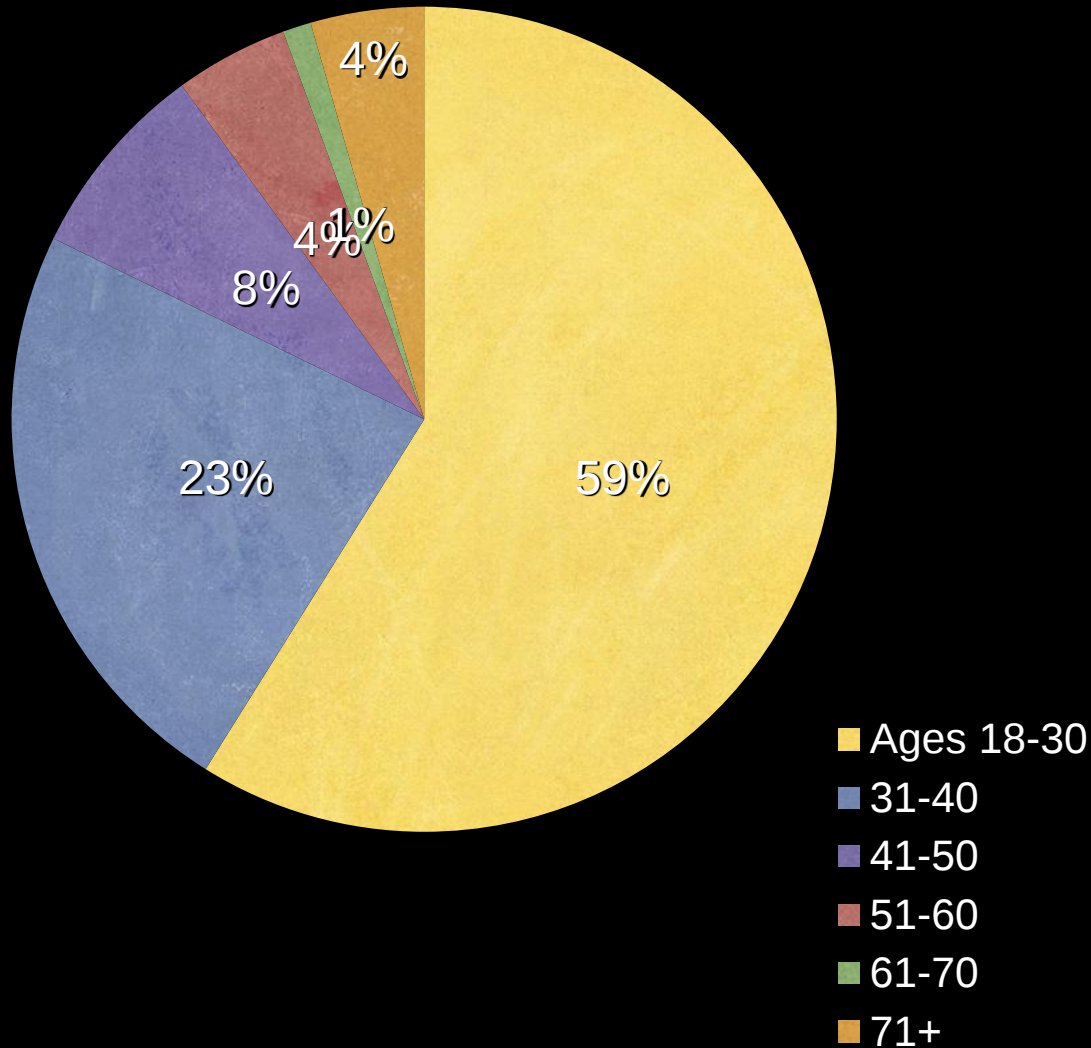
Adaptive Design Optimization

- Bayesian approach to increase accuracy of assessment with fewer trials;
- Analyzes data in real time, optimizing information from previous trials to ascertain a signal.

% Enrollment of all recruited in BRIGHTEN to date

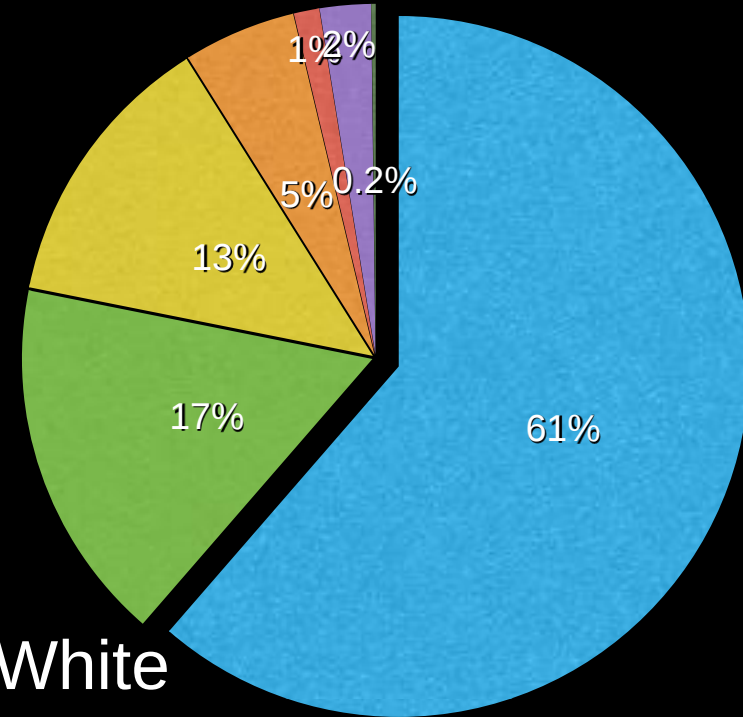
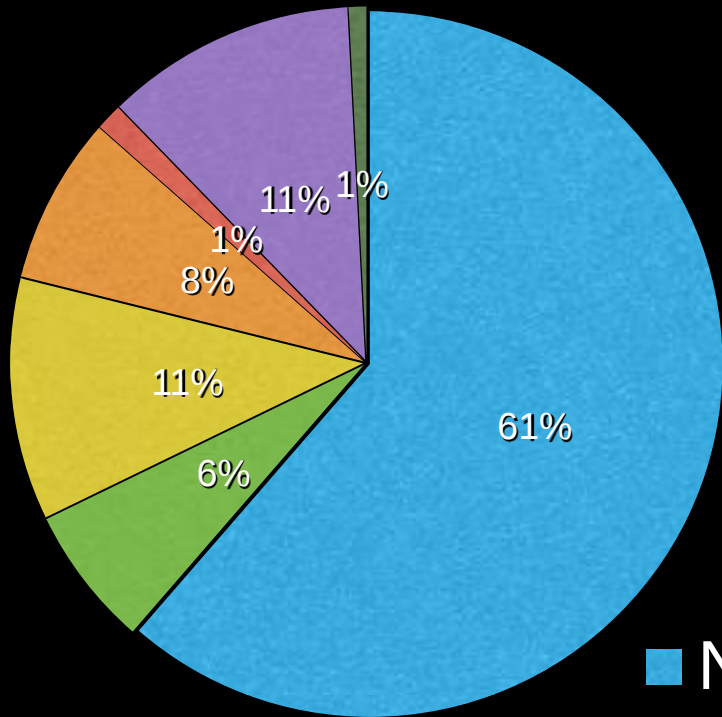


% of participants all recruited in BRIGHTEN to date



Ethnicity of participants

BRIGHTEN

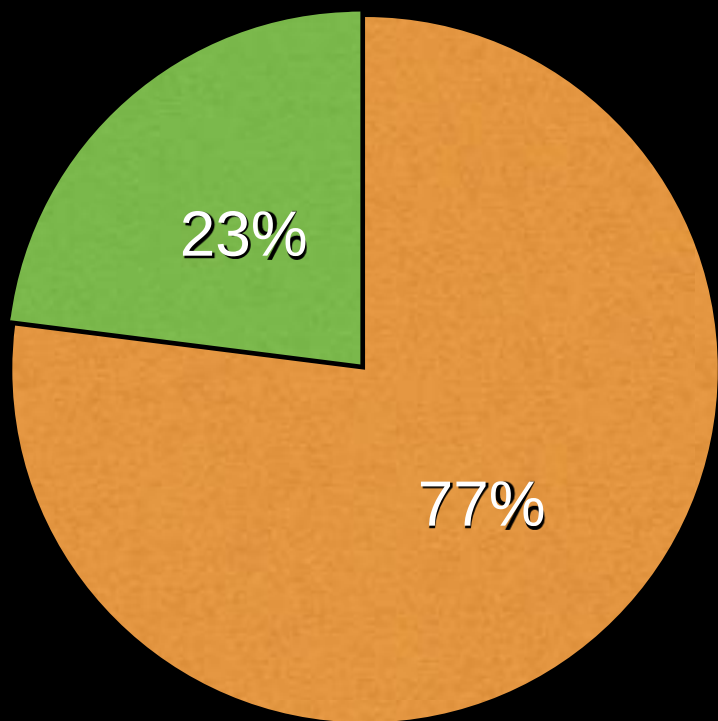


■ Non-hispanic White

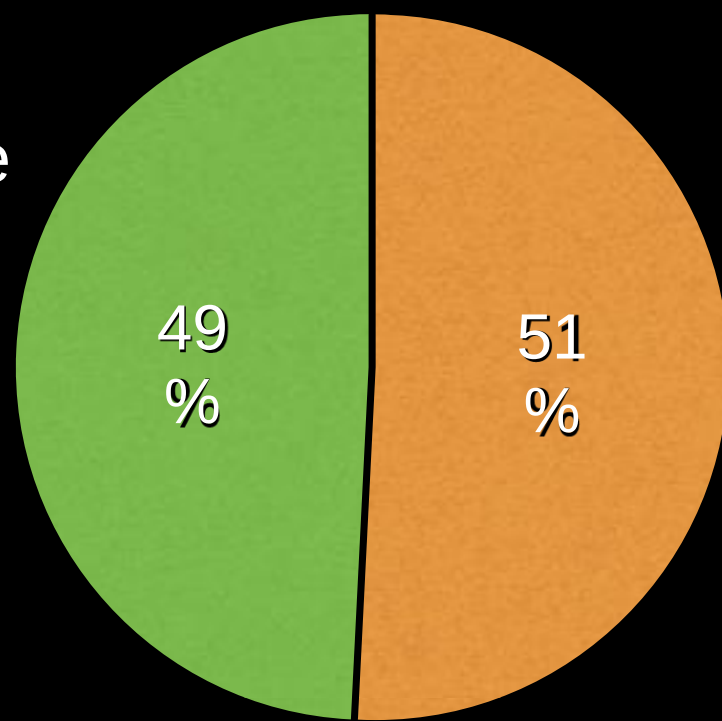
■ Hispanic

■ African-American/Black

BRIGHTEN

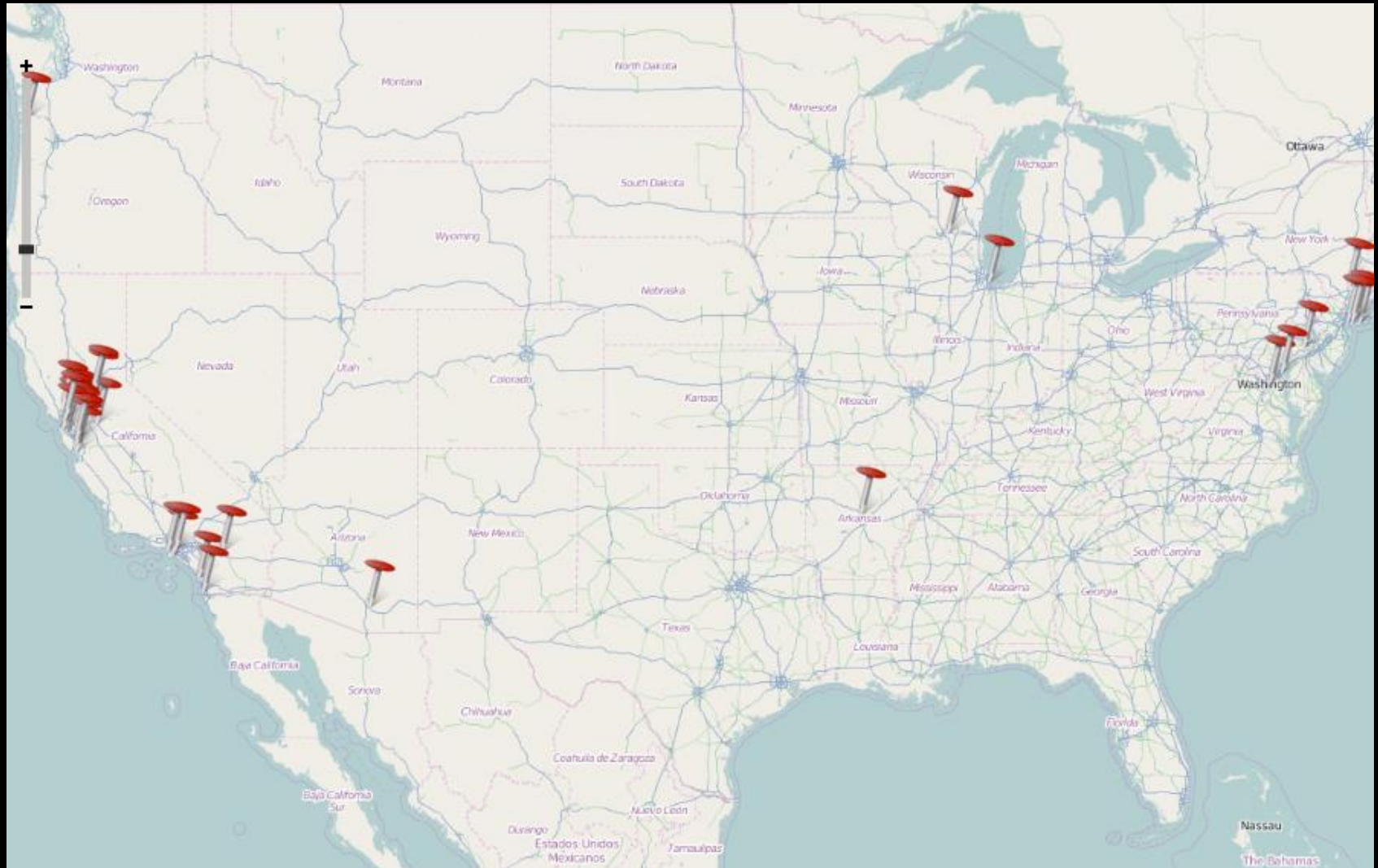


■ Female



May 1- July 11

MUNI + volunteer postings

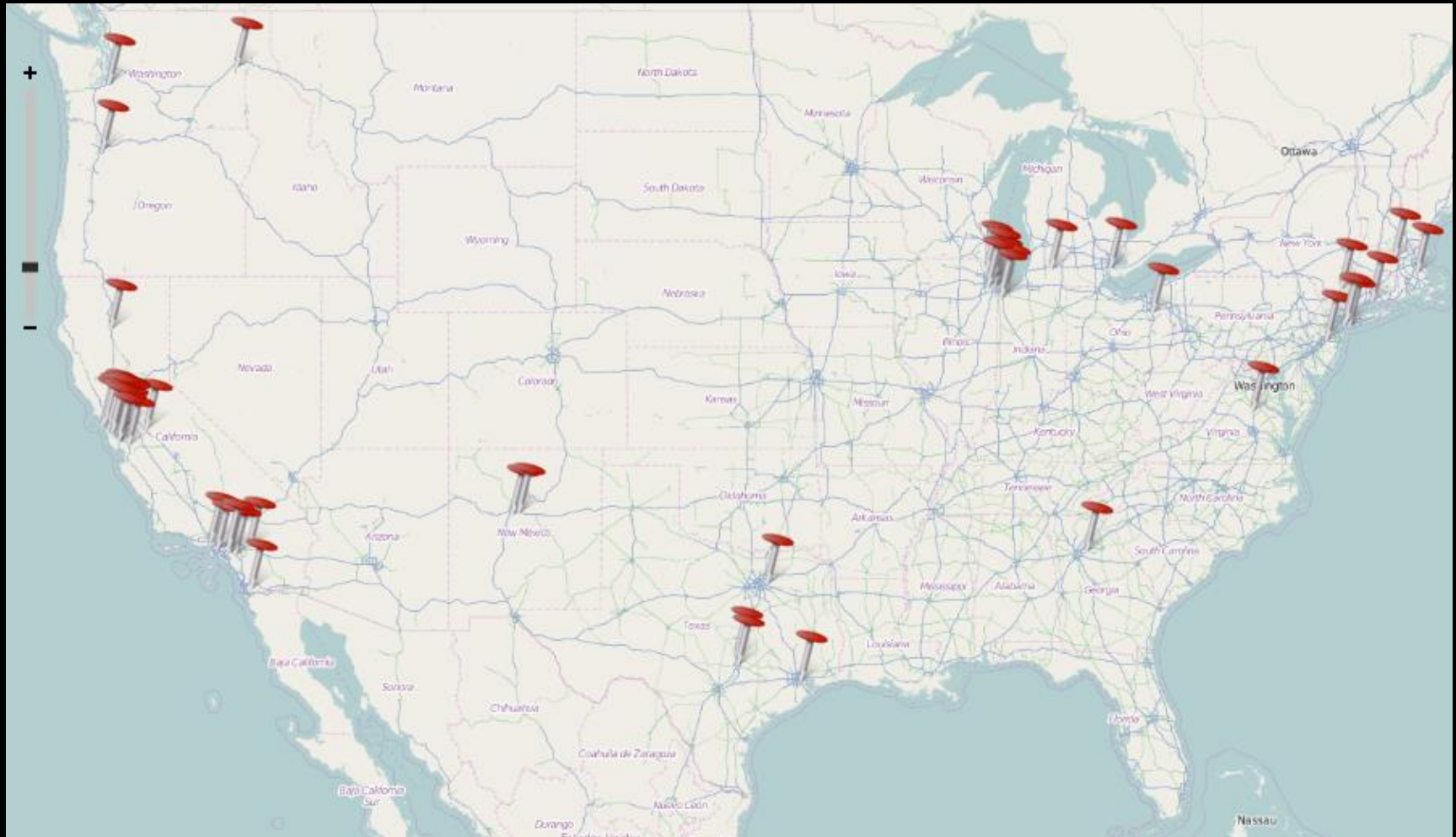


Total Recruited = 114

Study Total = 114

July 30-August 30

craigslist

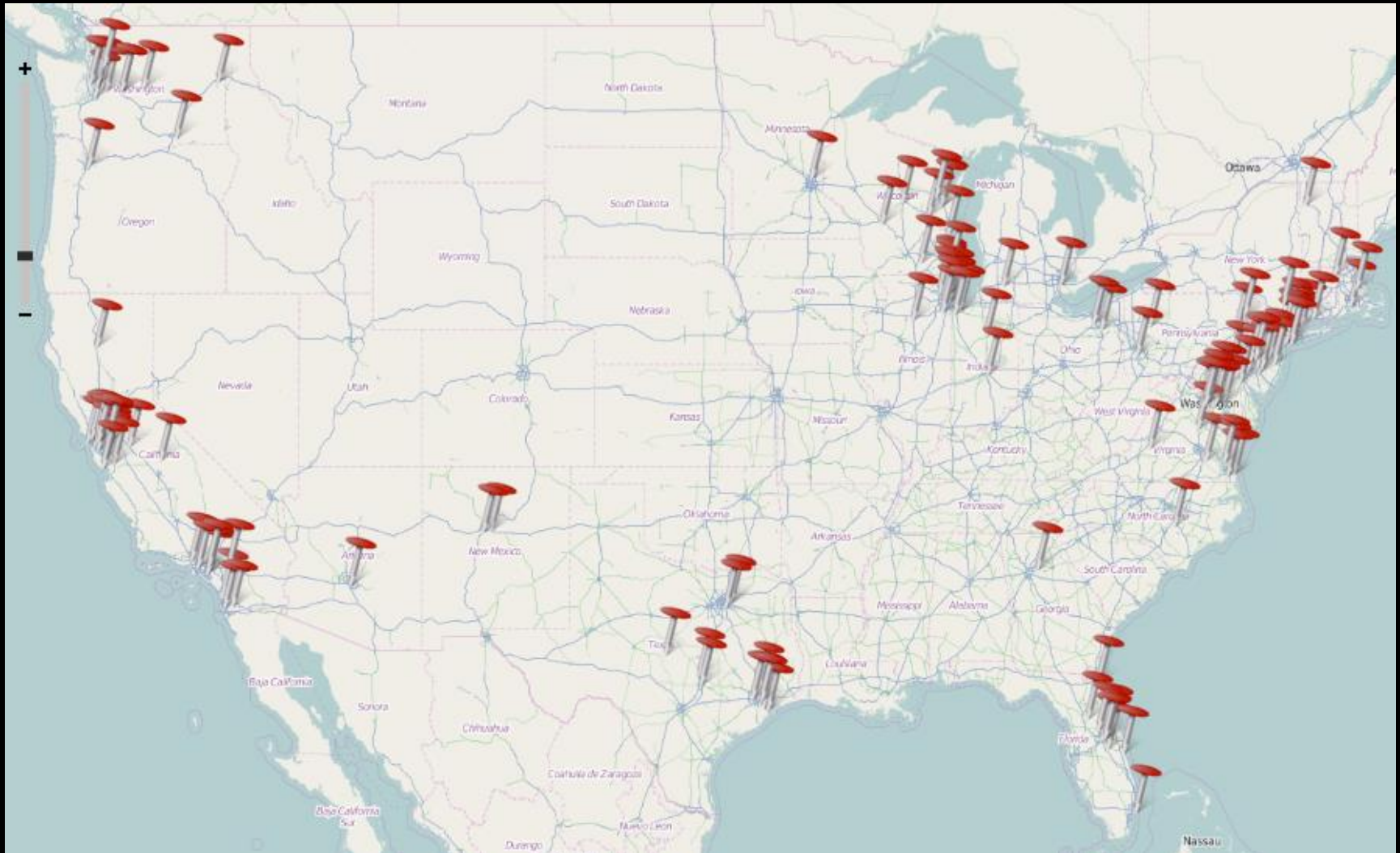


Total Recruited = 101

Study Total = 215

Sept 1-Sept 30

craigslist

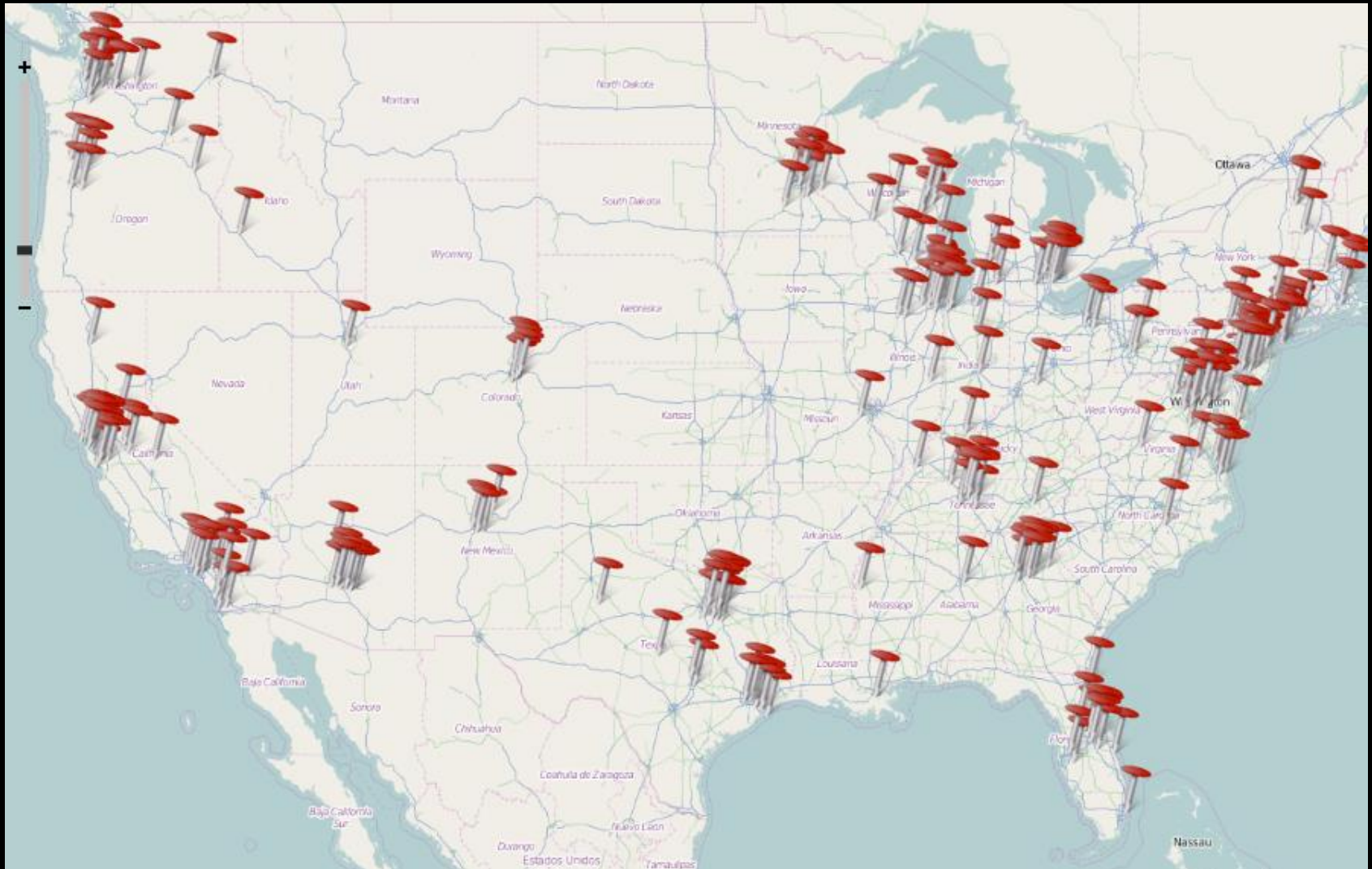


Total Recruited = 257

Study Total = 472

Oct 1- Oct 30

craigslist



Total Recruited = 519

Study Total = 991

Nov 1- Nov 30

craigslist

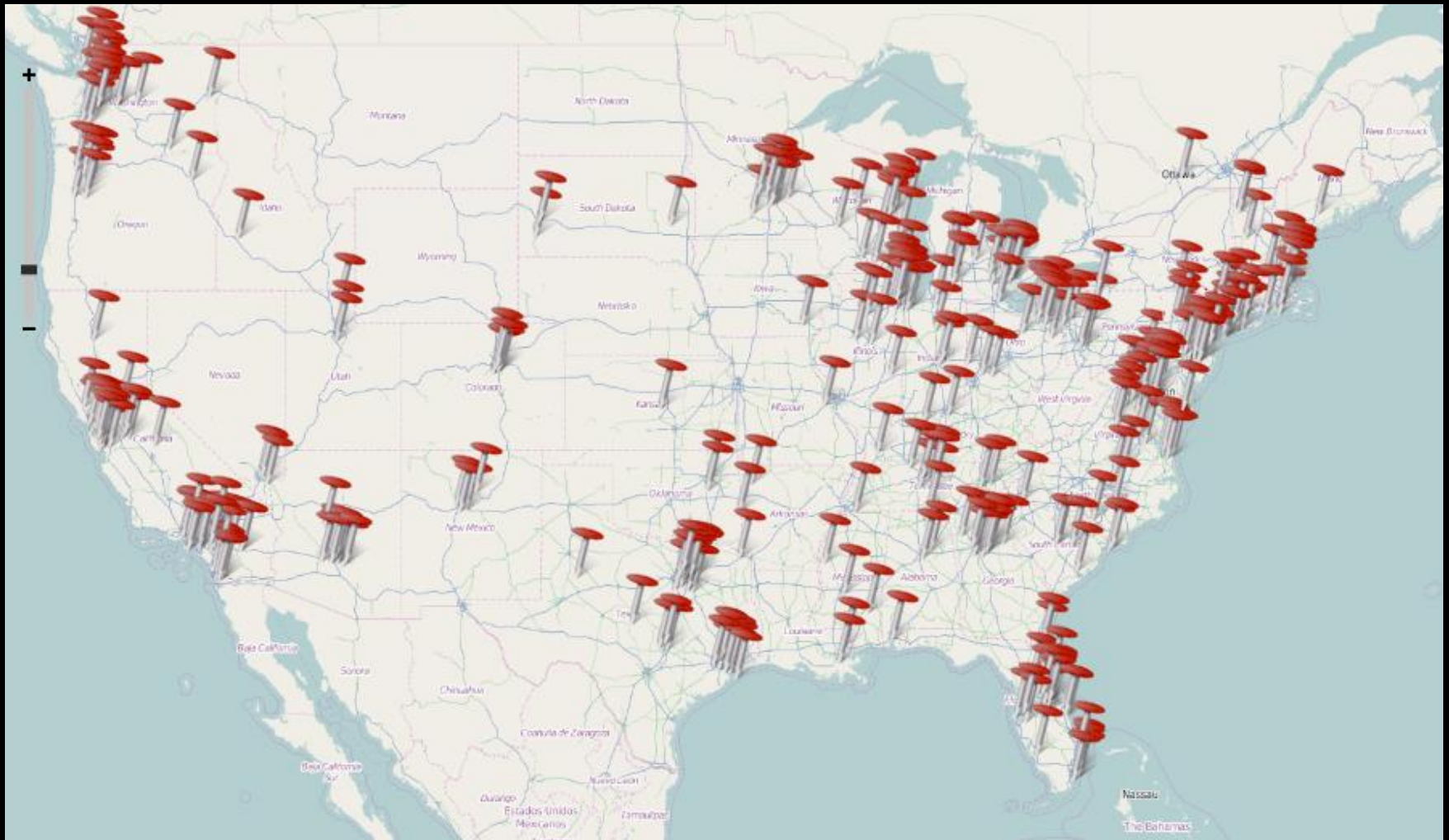


Total Recruited = 196

study Total = 1187

Dec 1- Dec 31

craigslist



Total Recruited = 288

Study Total = 1475

Jan 1- Jan 31

craigslist



Total Recruited = 183

Study Total = 1658

(found us on their own)



Next Steps

- Younger and older adult depression research outcomes:
 - Cognition
 - Activity
 - Sleep
- Develop new tools to improve accuracy, engagement, and meaning;
- Explore relationship between cognition, function and mood;
- More opportunities for cross talk among child, adult and older adult researchers.