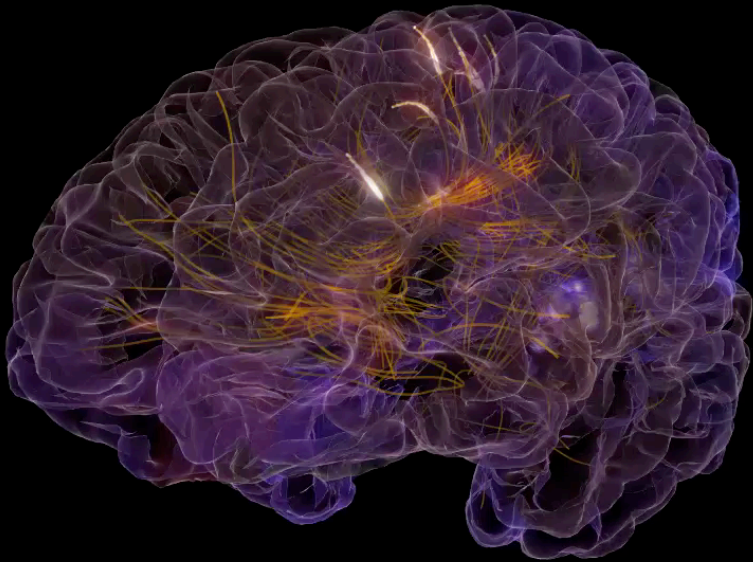


The Use of Targeted Video Games to Enhance Cognitive Characterization and Remediation



Joaquin A. Anguera, PhD

Director - Clinical Program | Neuroscape

Director - Digital Health Core

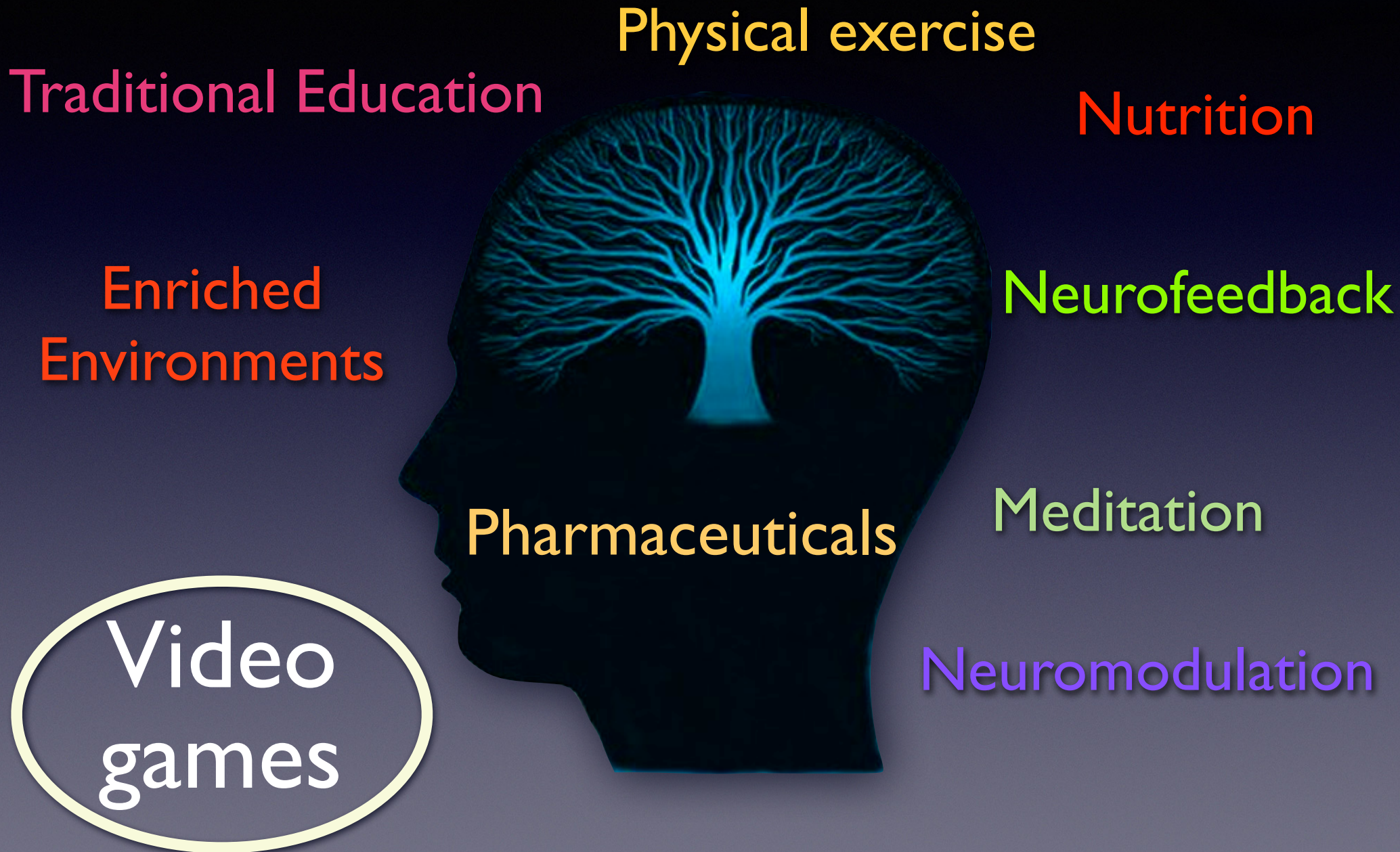
Assistant Professor - Neurology and Psychiatry
University of California, San Francisco



Research Motivation

- Identify alterations in fundamental brain mechanisms that underlie the broad spectrum of cognitive deficits.
- Leverage these mechanisms to enhance deficient cognitive control processes.

Cognitive enhancement



The next wave of studies

★ Patricia Arean

- Depression & Aging
 - *Geriatric Depression*
 - *Mobile At-Large Intervention*



Research Motivation

- Older adults with cognitive control deficits respond poorly to antidepressants
- Individuals with Late Life Depression have difficulty ignoring irrelevant information
- NIMH (2015) strategic plan called for ‘novel interventions’ that treat known cognitive & behavioral correlates of depression

Games for Overcoming Late-Life Depression

★ Patricia Areán



★ Faith Gunning

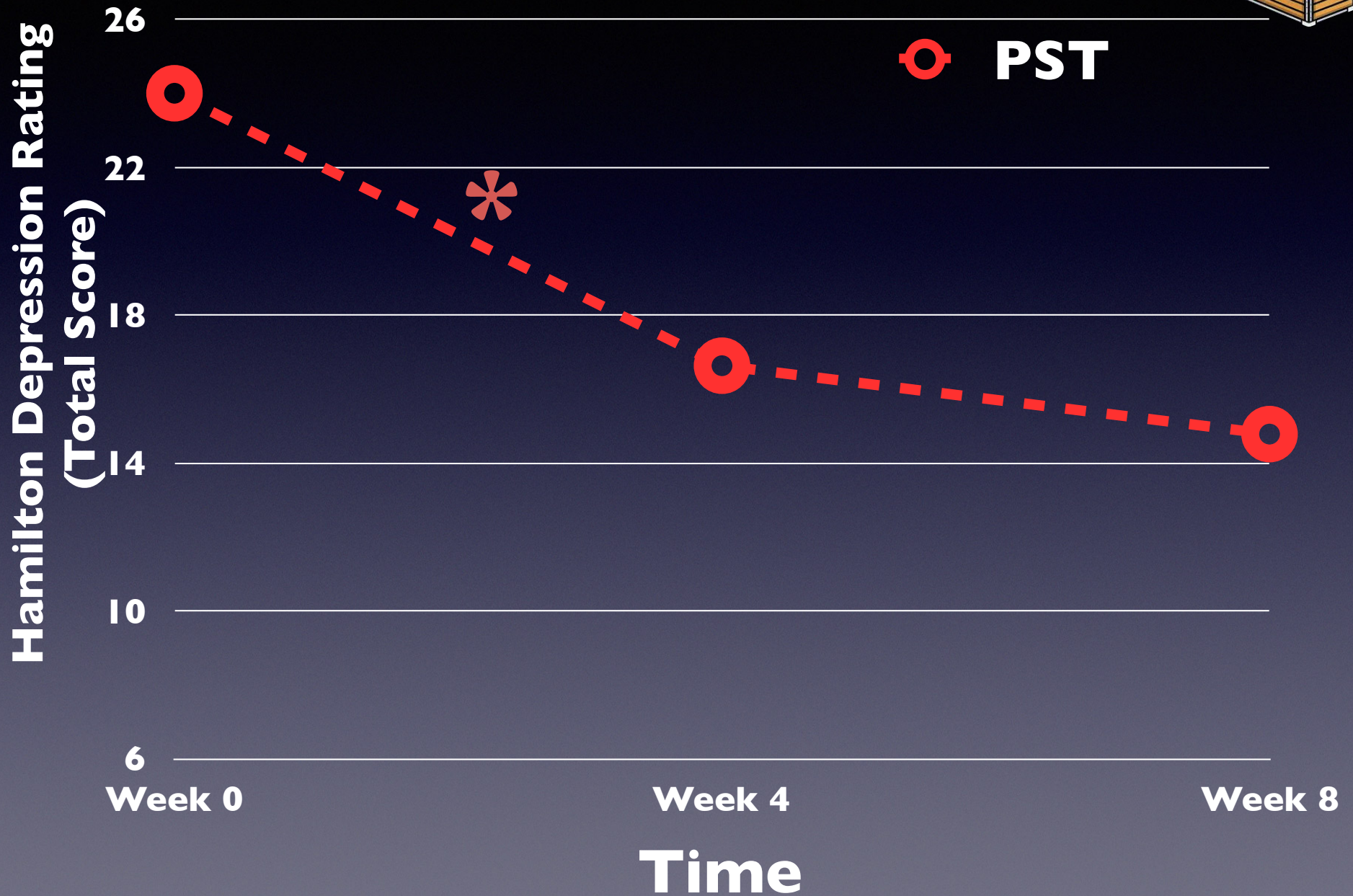


4 weeks of training

- Geriatric individuals with severe depression
- Eager to try non-pharmaceutical treatments

Depression Severity

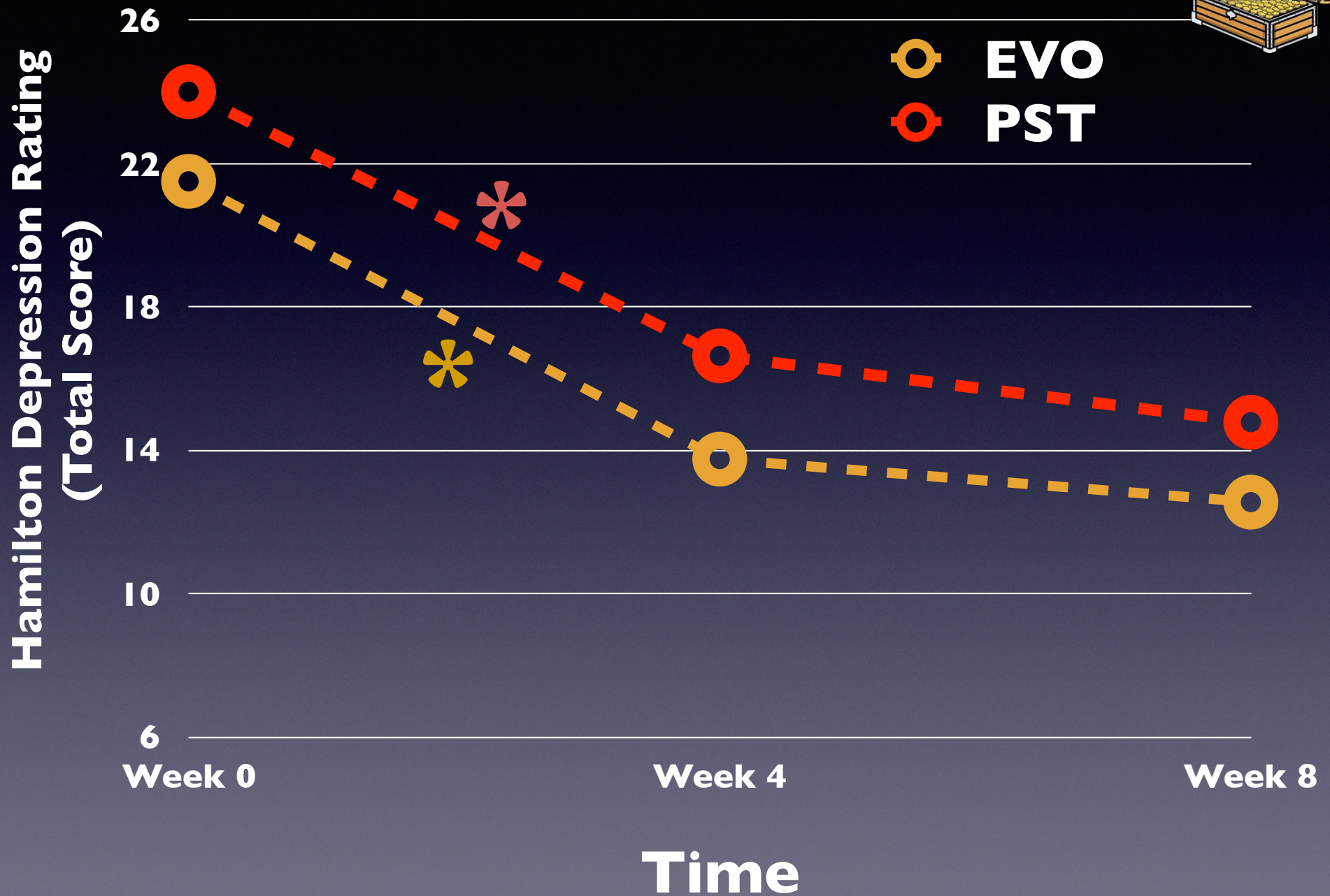
G.O.L.D.



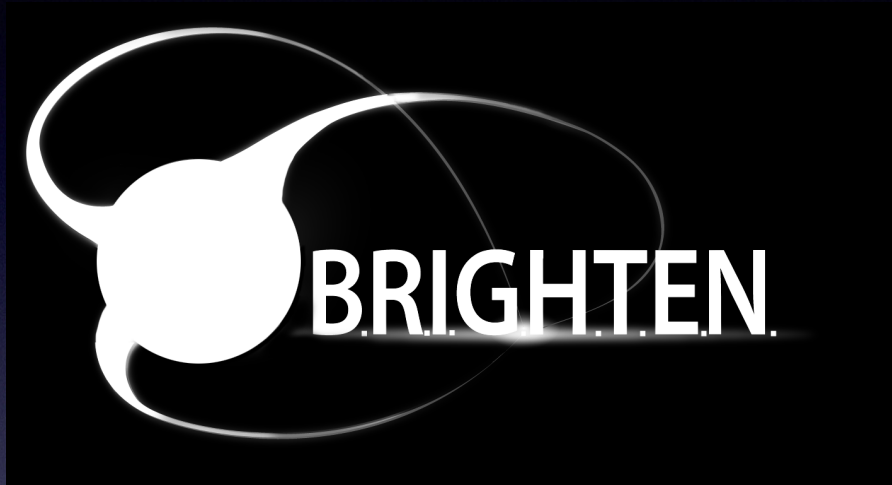
Anguera et al. 2016

Depression Severity

G.O.L.D.



Assessing AND Remediating outside the lab



**“Bridging Research and
Innovation for Greater
Health in Technology,
Emotion and Neuroscience”**

**Can mood and brain game
apps really contribute to
mental health?**

Anguera et al. 2016

Arean et al. 2017

www.brightenstudy.com



HOME

STUDY DESCRIPTION

ELIGIBILITY

Do mood and brain game apps really work?

Join our 100% mobile study to explore if these apps improve your mood, concentration and motivation.

You don't even have to leave your home to join.

**Eligibility
Assessment (PHQ-9)** → **Self-administered depression
rating**

Randomization

Study Arms



EVO on
iPad

and



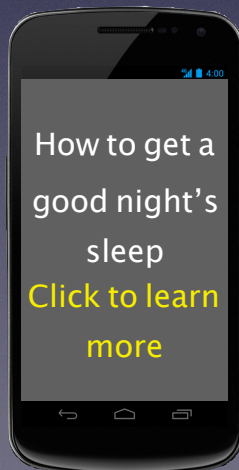
PST on
your phone

and



Ginger.io to
answer
surveys on
your phone

and



Health Tips on
your phone

Anguera et al. 2016
Arean et al. 2017

Primary Assessments



Passive **Analytics**

Location

Call Metrics

SMS Metrics

Accelerometer

Screen Usage

Survey	Frequency
PHQ-2	Daily
PHQ-9	Weeks 1-4, 6,8,10,12
SDS	Weeks 0-4, 6,8,10,12
GAD	Week 0
Alcohol	Week 0
IMPACT-mania	Week 0
PGIC	Weeks 0, 4, 8,12
IMPACT-mental health	Weeks 0, 4, 8,12
Sleep	Week 0, 4, 8, 12
App use	Week 0, 4, 8, 12
App satisfaction	Week 0, 4, 8, 12

Anguera et al. 2016

1. Watch the tutorial for EVO



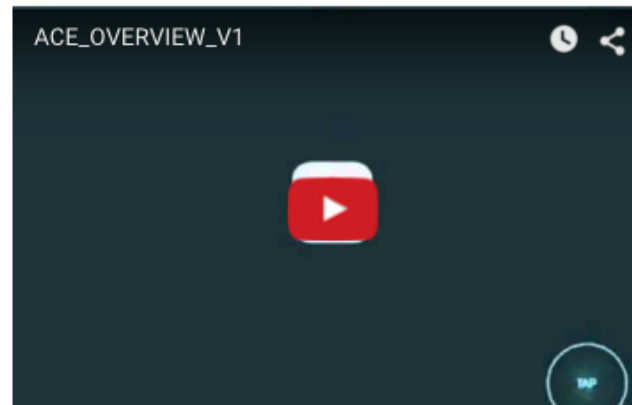
then...

Click on EVO
icon to download



[Download the instruction
manual here \(PDF\)](#)

2. Watch the tutorial for ACE



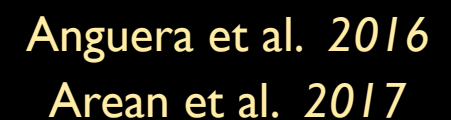
then...

Click on ACE
icon to download



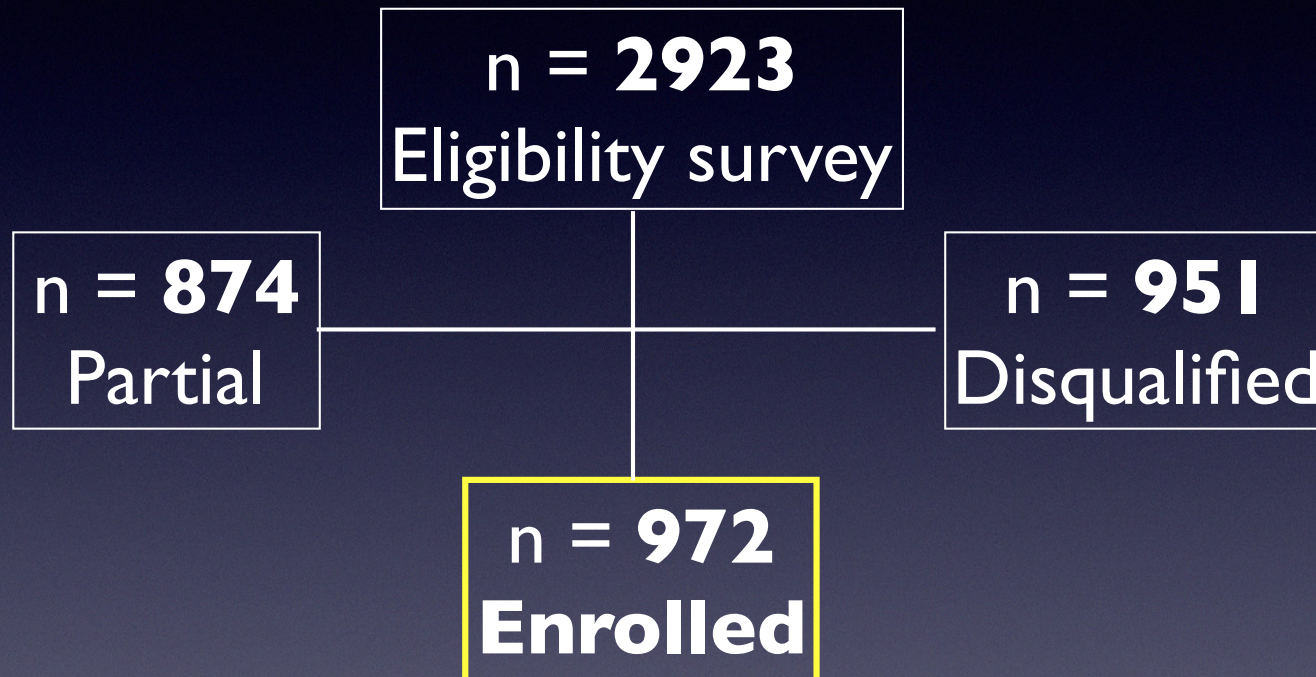
3. Use the username and password provided in your email to play EVO & ACE, and for info regarding the Ginger.io app!

Aug 1 - Jan 31 2014-2015 craigslist





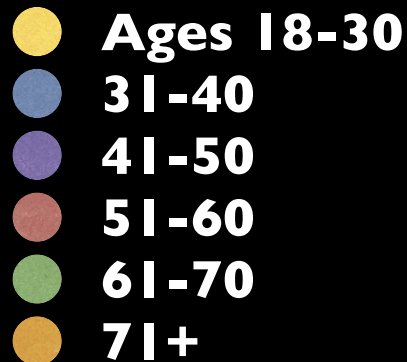
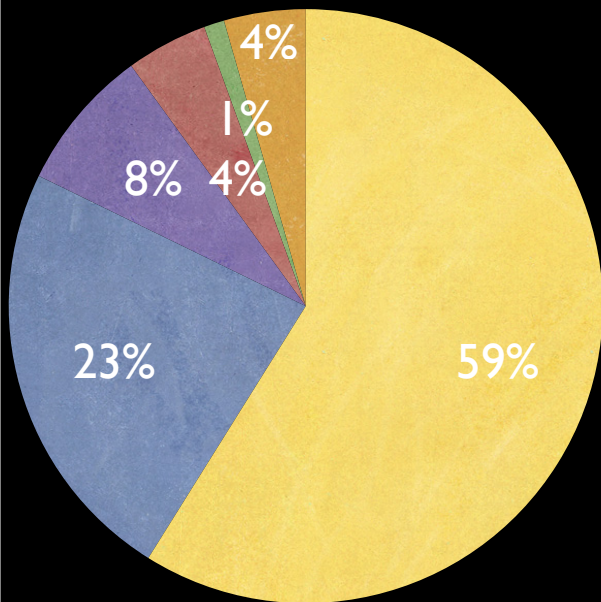
Participant CONSORT table



Participant Demographics

a)

% in each age range
of recruited sample

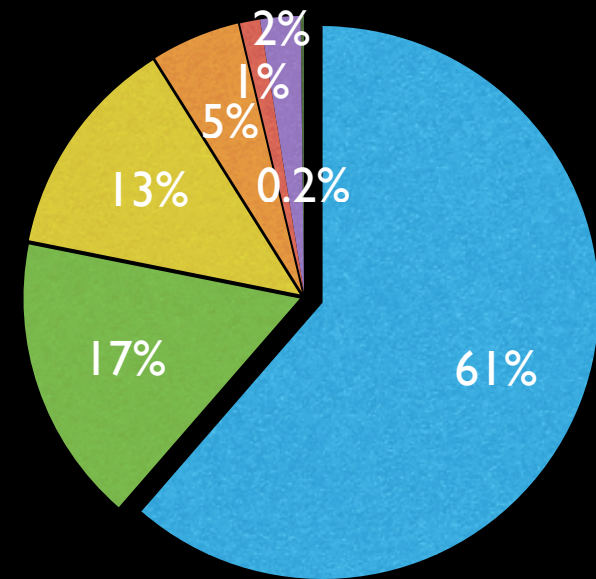
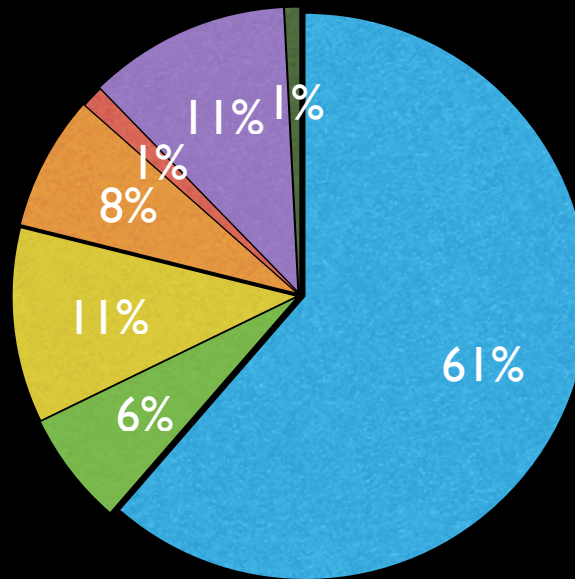


b)

Participant Ethnicity

BRIGHTEN

U.S. Census (2013)



Participant Acquisition Costs

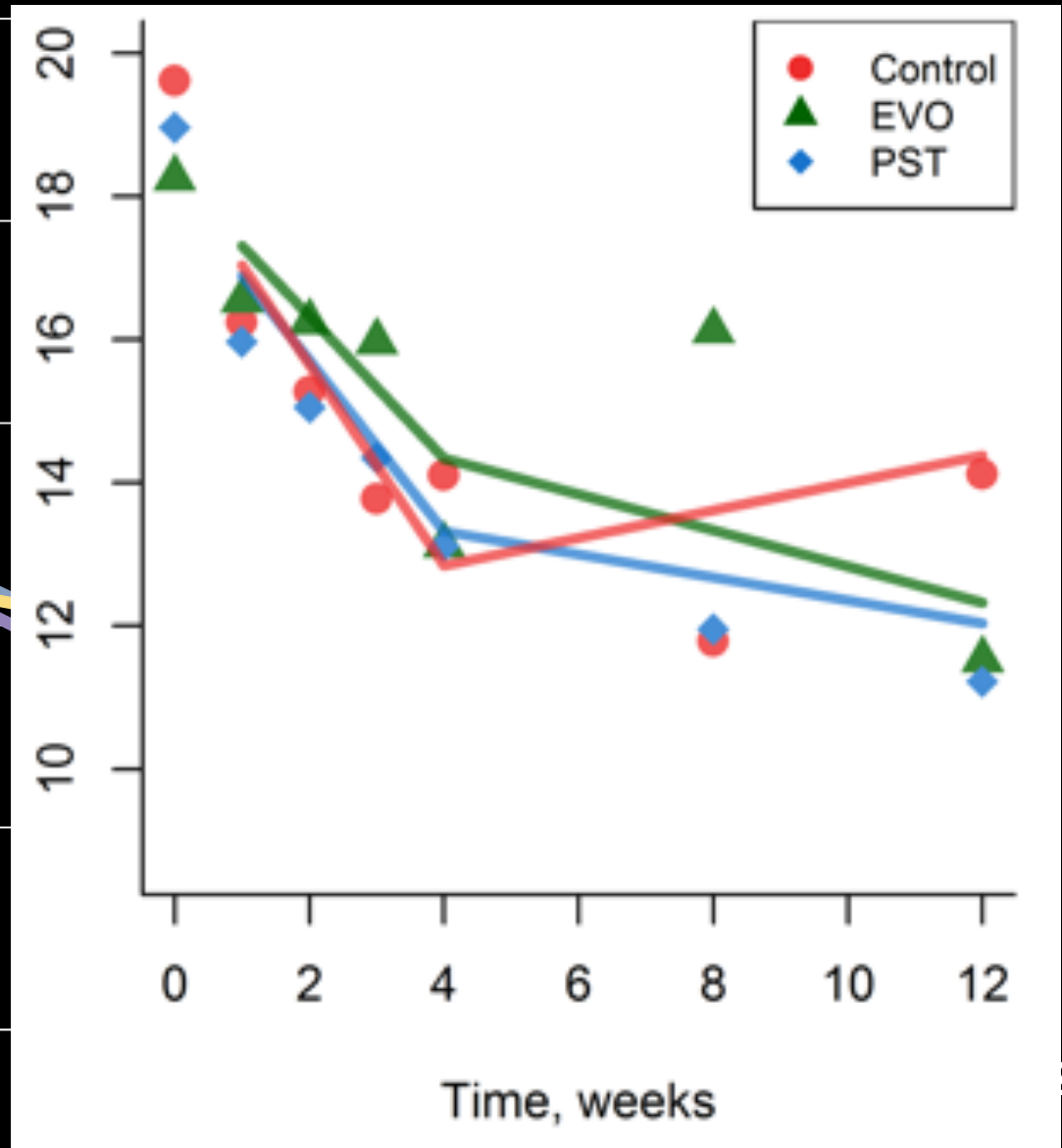
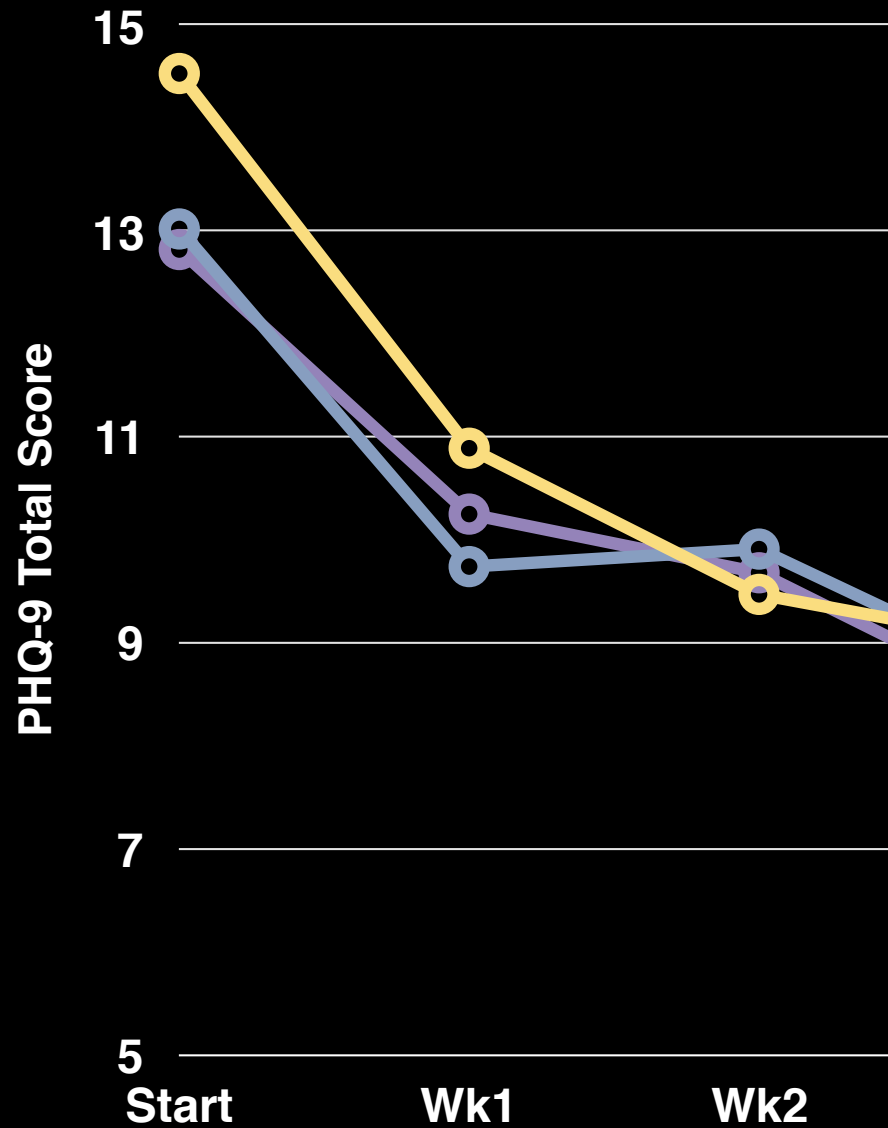
	Initial Recruitment	Enrolled	Using Treatments	Using Assessments & Treatments	Recruitment + Average Participant Payment	Individual “Complete” Data Set
Craigslist	\$0.31	\$0.81	\$3.19	\$4.00	\$39 ± \$21	\$79

Typical RCTs cost millions of dollars and recruit 200– 300 participants in 3–5 years

\$314,264 over 2 years

Remediation

Depression by Group



Anguera et al. 2016

Arean et al. 2017

Mental Health & Disparities Research



...what would happen if
we actually *tried* to enroll
these folks?!



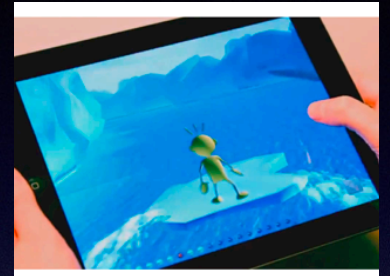
2.0

www.brightenstudy.com/spa

Summary

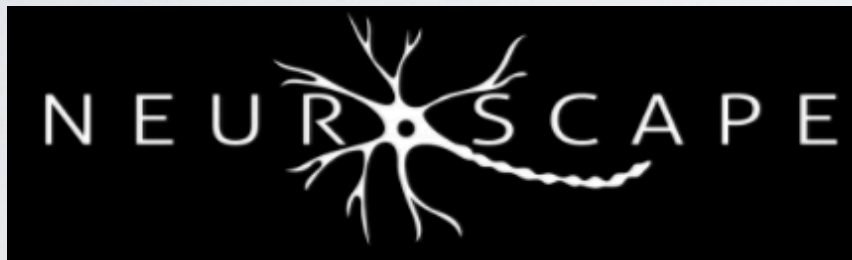


Targeted cognitive control interventions for **depression** show promise



Such mobile apps can reach clinical populations, but personalization is critical

MANY MANY THANKS ...



- **Adam Gazzaley**
- **Pat Arean**
- **Abhi Pratap**

National Institute of Mental Health (PAA R34-MH100466, T32MH0182607, K24MH074717)

National Institute on Aging (JAA P30-AG15272)

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www.neuroscape.ucsf.edu

