

# Using mobile technology to augment therapy and provide self-help: Preliminary research findings with the ACT Daily mobile app



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- Utah State University Research Catalyst Grant
  - Office of Research and Graduate Studies (RGS)

# Improving Treatment

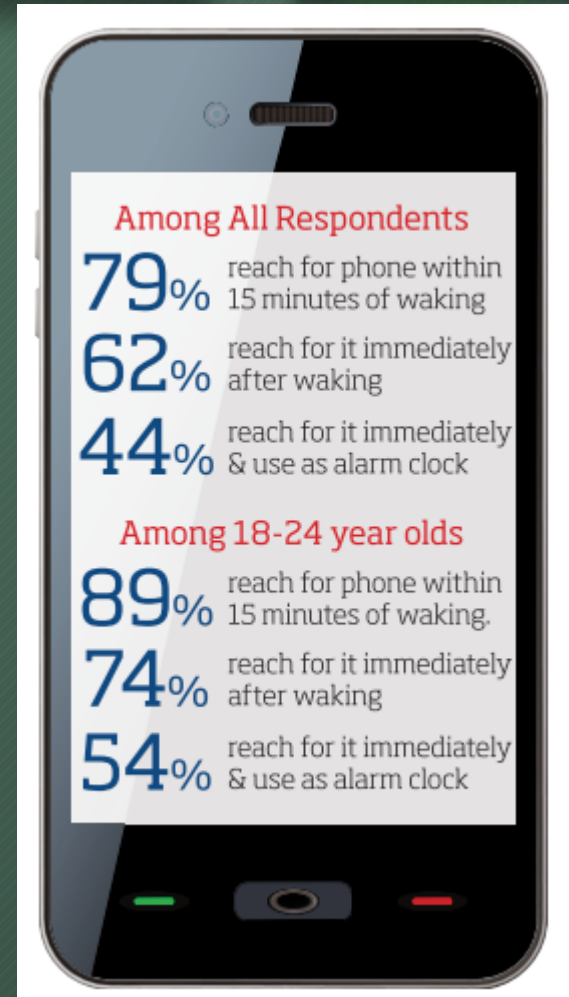
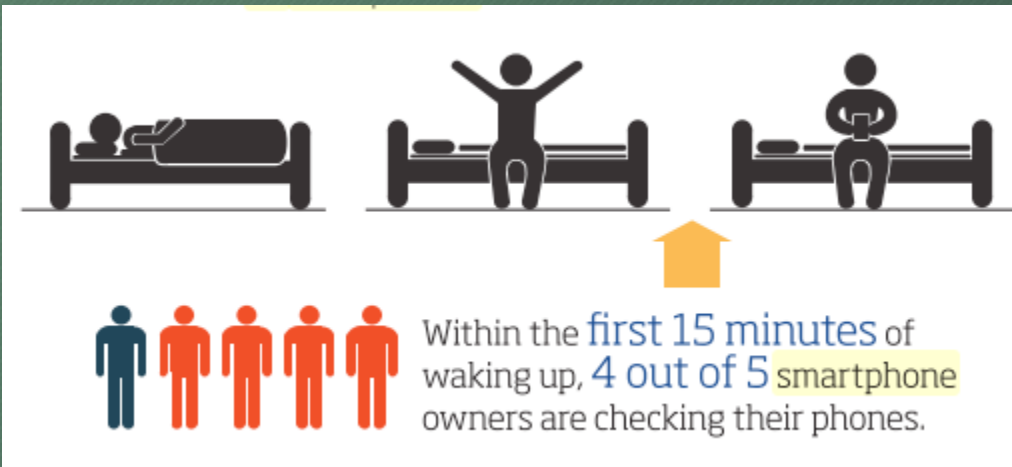


- Face-to-face therapy
  - ACT has growing research support (Hayes, Villatte et al., 2011)
  - Little to no gain over other previously established treatments (Baardseth et al., 2013).
    - *Improvements are needed for depression and anxiety disorder treatment*
- How do we address this?
  - Acquisition
  - Strengthening
  - Generalization

# Cost-effective, innovative solution



- 91% global mobile penetration (Source Digit, 2012)
- 71.6% smartphone penetration in the US (ComScore, 2014)
- Acceptability of mHealth
  - 76% of general public (Proudfoot et al., 2010)
  - 90% of therapists (Whitfield & Williams, 2004)



# Mobile Apps



- Available throughout the day (increased intervention accessibility)
- Monitor & prompt skill use
- Mobility and adaptability of use
- Tailored content (contextualized)
- Supportive accountability
- Adherence to treatment
- Target specific processes

# ACT Daily



- Goals:

1. Increase effectiveness of face-to-face ACT
2. Simple, skills-focused ACT skills “toolbox”
  - Focus on building practice & generalization
  - Minimize explanation / text, increase engagement
3. EMI: brief skills are used in “real time”

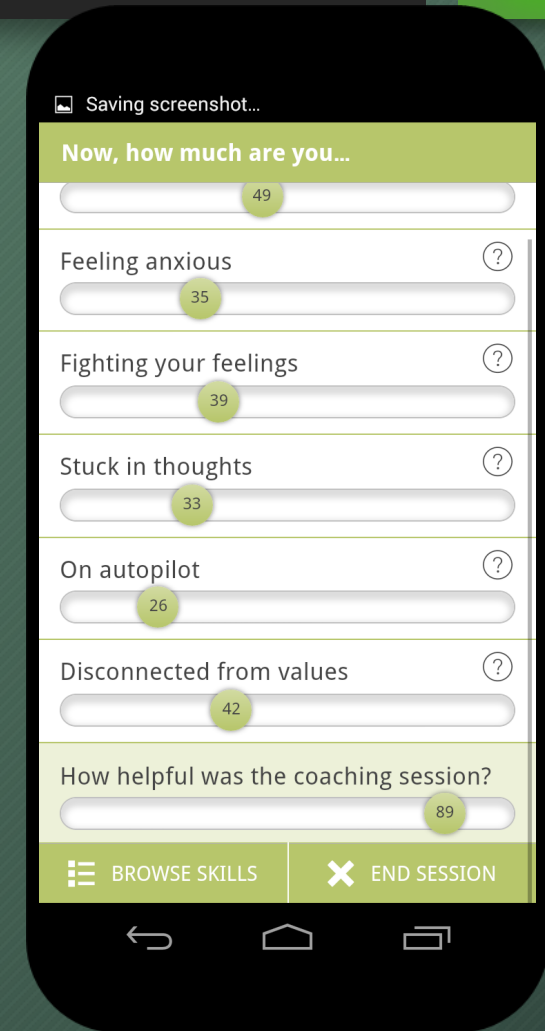
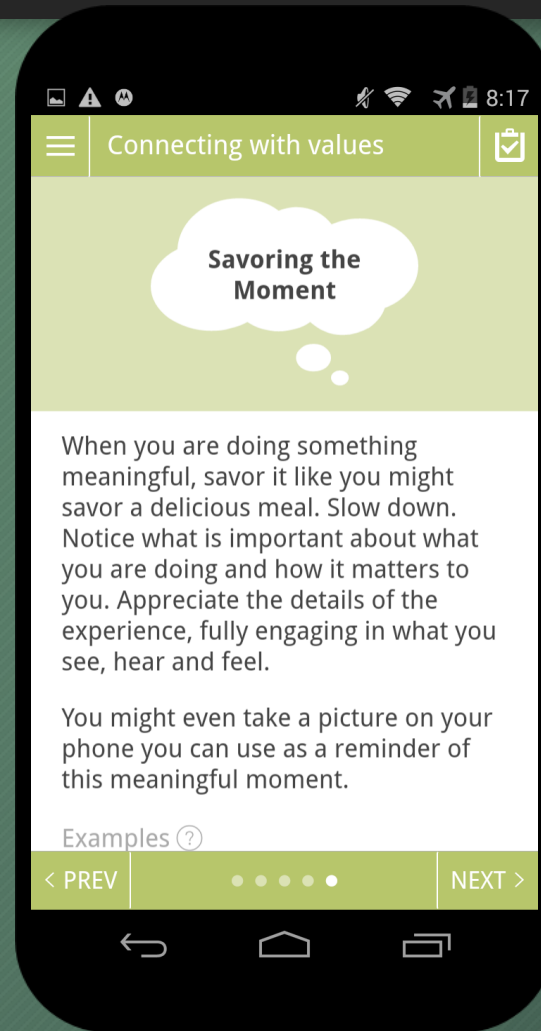
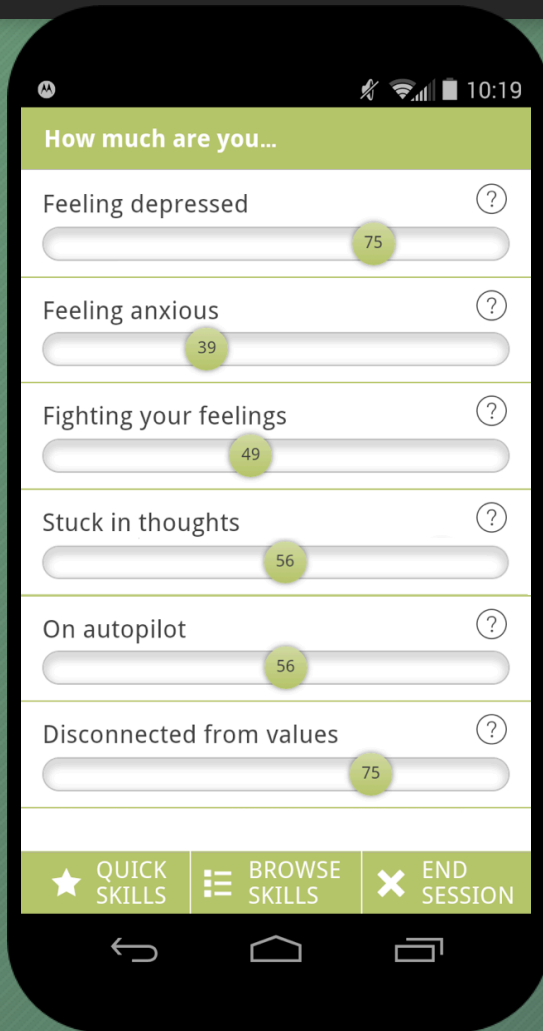
# ACT Daily: Design



## Ecological Momentary Intervention (EMI)

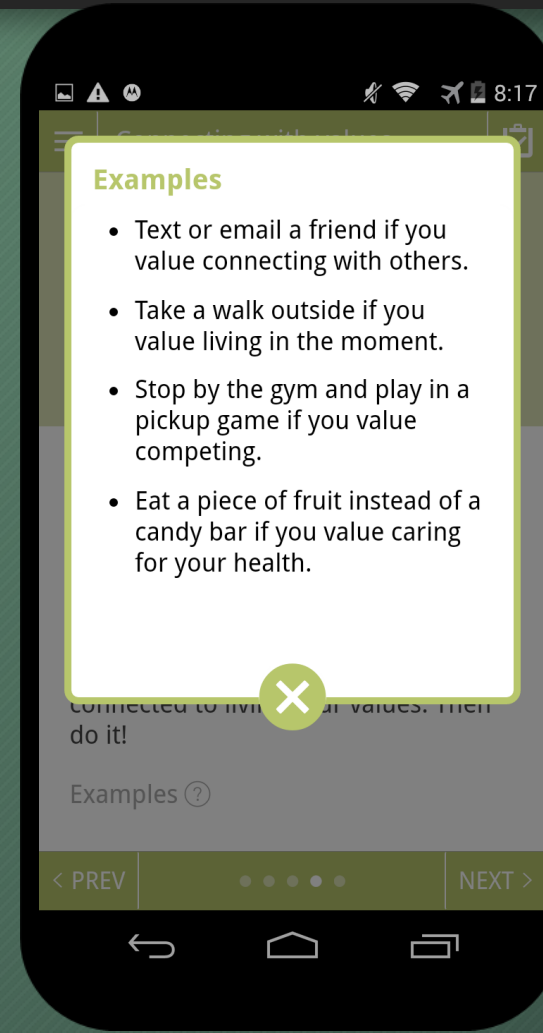
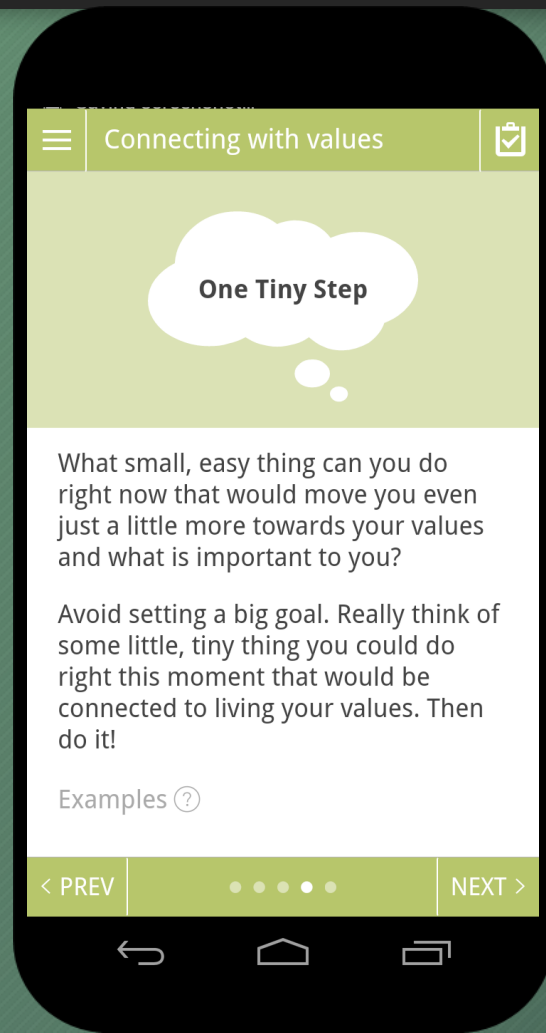
- Random prompts tracking:
  - Emotional distress (anxiety & depression)
  - ACT processes:
    - Acceptance
    - Defusion
    - Present moment awareness
    - Connection with values
- **Triggers brief tailored intervention**
  - Quick skills (1 minute)
  - Browse skills (5 minute audio, interactive exercise)

# Design - quick skills

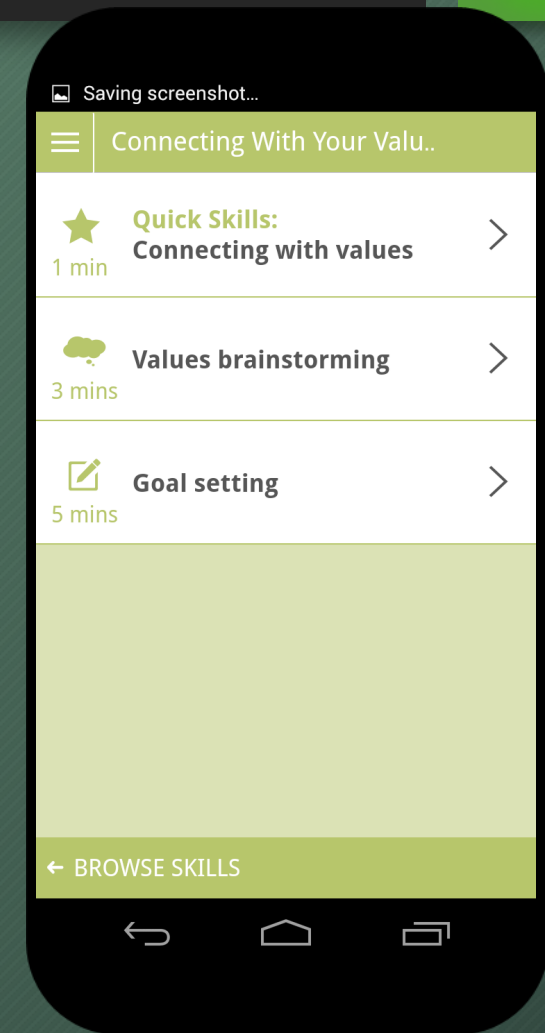
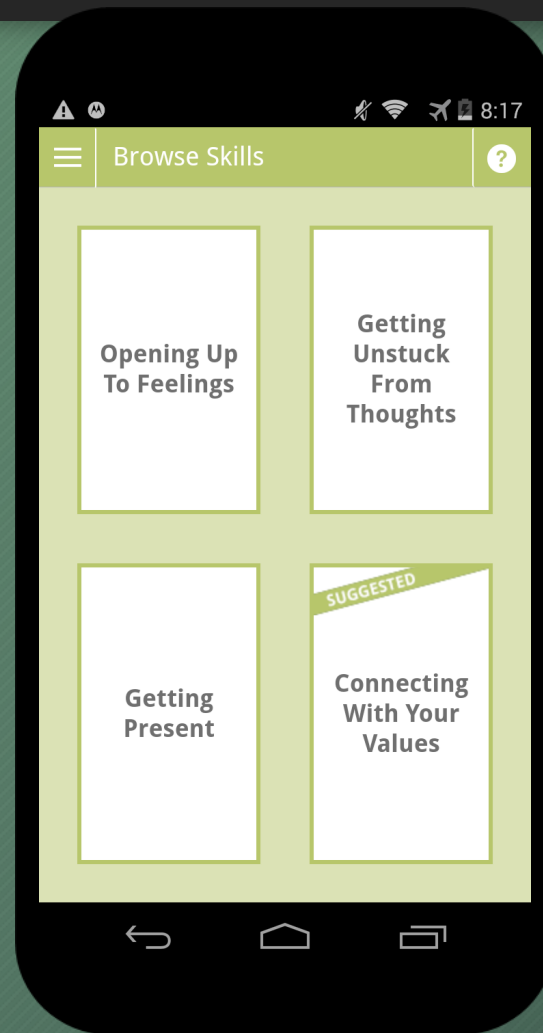
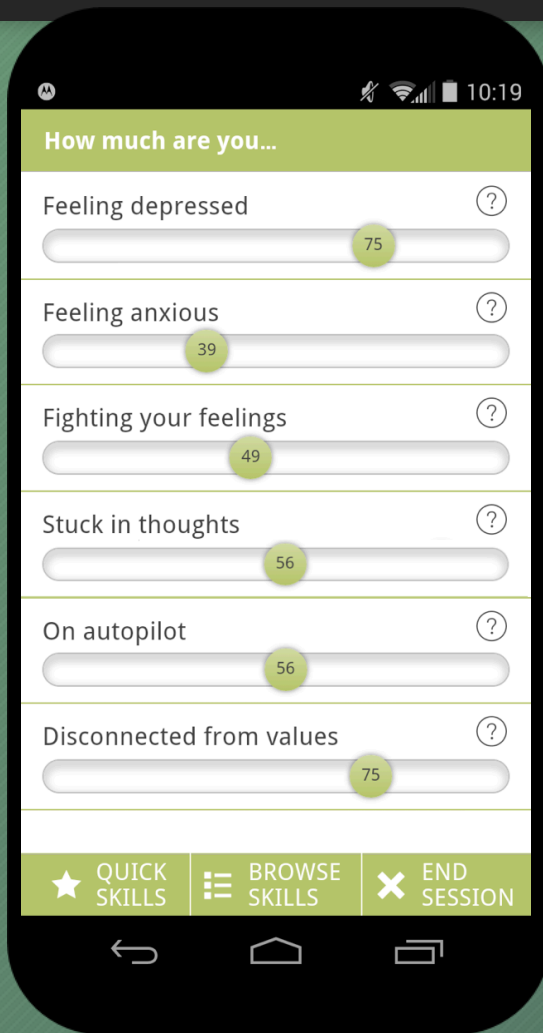




# Values Quick Skills (cont.)



# Browse Skills option



# Goal Setting



Goal setting

Rate how consistent your actions have been with your values *today* in the following areas:

*From 0 (not at all) to 100 (very much so)*

**Work/Education** 64

**Relationships** 34

**Recreation/Fun** 21

**Personal Growth/Health** 24

... NEXT >



Goal setting

Values are like a direction on a compass. If you aren't headed where you want to, don't beat yourself up about it. Instead, check your map and see what can get you back on track.

With that in mind, pick one of these areas you want to work on today, maybe right now.

- Work/Education
- Relationships
- Recreation/Fun
- Personal Growth/Health

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Goal setting

Consider what your values are in **Recreation/Fun**. What is important and meaningful to you about your actions in this area of your life?

My **Recreation/Fun** values:

Creativity



Goal setting

What is a goal you could set for today to work on your values in **Recreation/Fun**?

Paint for 1 hour this afternoon

Try to set a goal that is very detailed and specific. One that says exactly *what* you will do, *when* you will do it, and *for how long*.



Goal setting

We encourage you to really work on this goal. We can't save your goal on the app, but consider writing it down or saving a picture of this screen on your phone.

**Area:** Recreation/Fun

**Values to work on:** Creativity

**Goal for today:** Paint for 1 hour this afternoon

*Don't forget the post assessment!*

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# CCC Waitlist Study



- **Challenges of mental Health Problems in College**

- 50% of college students have a diagnosable psychological disorder in a given year (Blanco et al., 2008)
- 32% report feeling so depressed that it is difficult to function
- >50% overwhelming anxiety
- 86% felt overwhelmed by all they had to do
- 20% report some form of self-injury (ACHA, 2014)

- **Costs:**

- Academic performance issues
- Decreased retention and graduation rates (Kitzrow, 2003)
- Suicide - 2<sup>nd</sup> leading cause of death (Suicide Prevention Resource Center, 2014)
- Self-injury & violence

- **College counseling centers (CCC)**

- Funding & staffing limitations
- Increasing demand for services and rates of severe psychological problems (Beamish, 2005; Gallagher, 2014).
- 1 counselor to every 2,081 students (widened by 500 students last year)
- Escalating rates of counselor workload, counselor burnout, & swelling waitlists (Gallagher, 2014).
- Long waitlists = client dropout (Levy et al., 2005).

# CCC Waitlist study



- Providing a mobile application to clients on the waitlist could:
  - Distribute support and initial training of general skills common across therapies (e.g., emotional self awareness)
  - Familiarize clients with the act of tracking emotional experiences
  - Lowering symptoms
  - No cost to the CCC (e.g., financial, time, or effort)

# Study Demographics



## Adjunctive:

- Participants
  - Currently receiving face-to-face ACT therapy
  - Anxiety and/or Depression
  - National Recruitment
- Demographics
  - Mean age = 29.92, range 20-55
  - 9 F, 5 M
  - Predominantly White (77%)
  - Broad range in SES

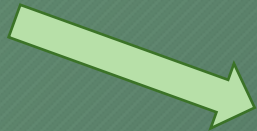
## CCC Waitlist (self-help):

- Participants
  - Depressive and/or anxious presentations
  - On CCC waitlist for at least 2 weeks
  - Recruited from USU CAPS
- Demographics
  - Mean age = 23.83, range 18-38
  - 9 F, 2 M
  - Predominantly White (80%)
  - Broad range in SES

# Study Design

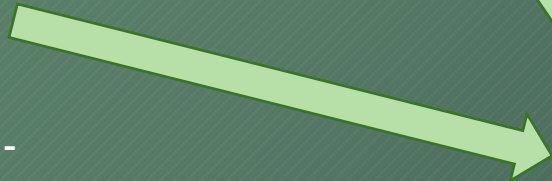


1) Phone screening (age, location, smartphone ownership)

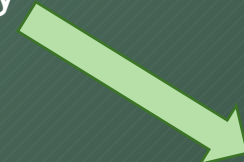


2) *ADJUNCTIVE*:  
Informed consent,  
baseline survey, &  
brief app training  
(Video/online or in-  
person)

2) *CCC WAITLIST*:  
Informed consent,  
baseline survey, &  
condensed ACT / app  
training(Video/online or  
in-person)



3) Complete online  
post-survey



4) 30 minute  
phone interview

# Condensed Training (CCC Waitlist Study)

0%

100%

## ACT Knowledge Quiz

Let's start by assessing your base knowledge of ACT. Please answer the multiple choice questions below.

1. Opening up to feelings means to:

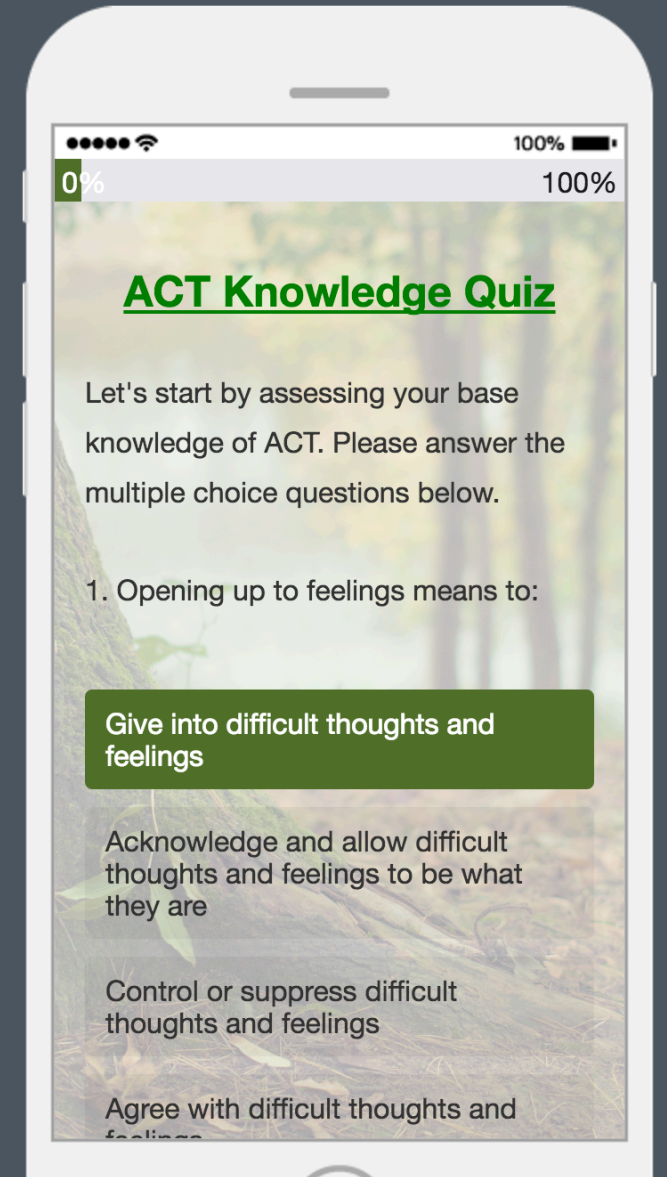
Give into difficult thoughts and feelings

Acknowledge and allow difficult thoughts and feelings to be what they are

Control or suppress difficult thoughts and feelings

Agree with difficult thoughts and feelings

2. What are control strategies?





# Condensed Training (CCC Waitlist Study)

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## ACT Skill: Getting Present

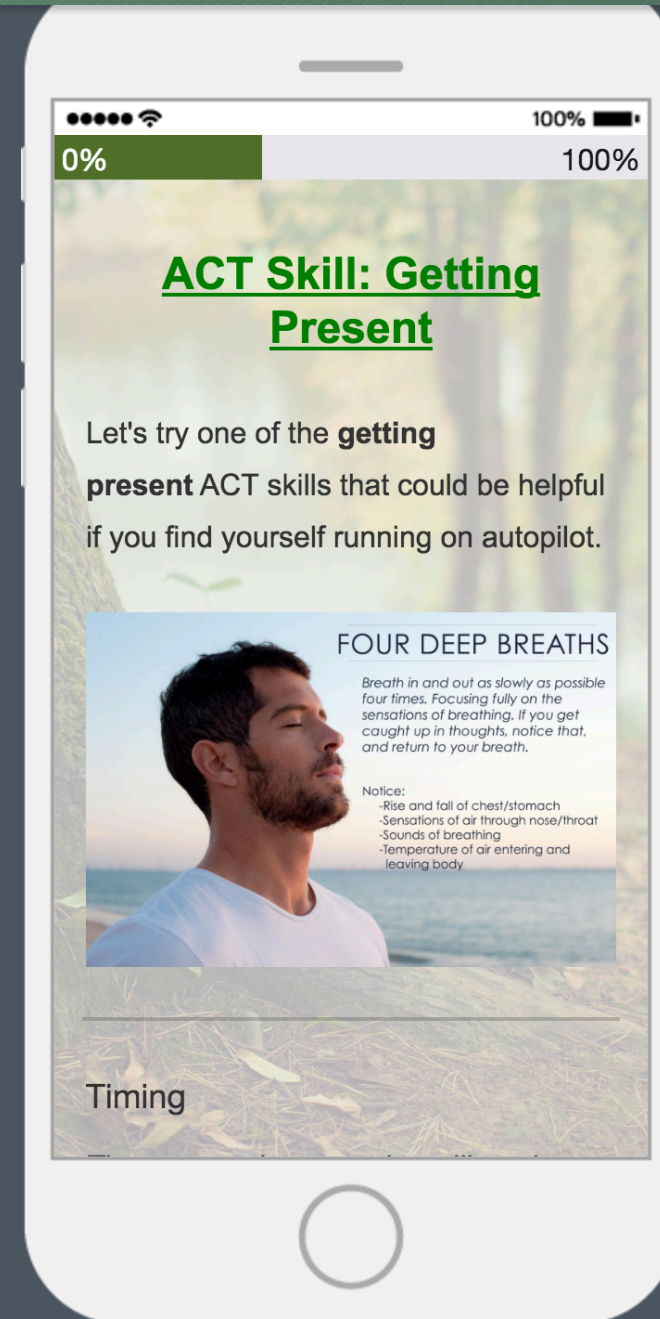
Let's try one of the **getting present** ACT skills that could be helpful if you find yourself running on autopilot.

### FOUR DEEP BREATHS

*Breath in and out as slowly as possible four times. Focusing fully on the sensations of breathing. If you get caught up in thoughts, notice that, and return to your breath.*

Notice:

- Rise and fall of chest/stomach
- Sensations of air through nose/throat
- Sounds of breathing
- Temperature of air entering and leaving body



# Condensed Training (CCC Waitlist Study)



0% 100%

## Leaves on a stream (cont.)



Now that you have completed the exercise, take a moment to reflect on your experiences.

- Were you able at times to step back and look at your thoughts as if they were on leaves?
- Did you notice when you lost sight of the stream and were getting "stuck" in your thoughts?
- Were there certain thoughts that tended to draw you in?

0% 100%

## ACT Daily App Training Video

Now it is time to get oriented to how the ACT Daily app works on a smartphone. Please press play on the video below to watch a brief training video.



# Results: System Usability Scale



- Subjective usability scale (Bangor, Kortum, & Miller, 2008)
  - “I would imagine that most people would learn to use this system fairly quickly.”
  - Mean = 87, Range 0-100.
  - “Excellent” usability
  - All participants “agreed” or strongly agreed” the system was easy to learn, and “strongly disagreed” that the system required specialized technical knowledge

# Pre-post assessments (Adjunctive)



Variable	Difference	t-statistic	<i>p</i>	<i>d</i>
DASS-Depression	0.36364	2.560	.028*	0.957
DASS-Anxiety	0.23377	1.590	.143	0.493
DASS-Stress	0.35065	2.218	.051*	0.742
AAQ	1.32468	3.702	.004*	1.172
VQ-Obstacles	0.96364	2.881	.016*	0.873
VQ-Progress	-.34545	-1.019	.332	0.309
CFQ	1.06494	3.955	.003*	1.194
PHLMS-Acceptance	0.48182	2.710	.022*	0.828
PHLMS-Awareness	-.19091	-1.221	.250	0.388

# Pre-post assessments (CCC Waitlist)



	Mean Difference	t-statistic	<i>p</i>	Cohen's <i>d</i>
DASS-Depression	4.636	2.400	.037*	1.120
DASS-Anxiety	2.727	2.232	.050*	0.754
DASS-Stress	3.636	2.277	.046*	0.843
AAQ	4.000	2.507	.031*	0.666
VQ - Obstacles	7.273	3.644	.005*	1.384
VQ - Progress	-4.273	-2.235	.049*	-0.873
CFQ	8.909	5.478	.000*	1.398
PHLMS - Awareness	1.000	0.496	.631	0.168
PHLMS - Acceptance	-6.273	-2.405	.037*	-0.799
ASQ	-35.545	-5.927	.000*	-2.841
ESAS	-3.364	-2.955	.014*	-0.775

# EMI data: Across participants & Across skills (Adjunctive)



## Latent Change Model

Variable	Latent Change Score (Estimate)	T-statistic	<i>p</i>
Anxiety	-7.941	-4.889	<.001*
Depression	-3.665	-1.612	<.001*
Fighting	-7.621	-4.566	<.001*
Stuck	-7.698	-3.877	<.001*
Autopilot	-7.715	-4.050	<.001*
Disconnected	-8.319	-4.416	<.001*

# EMI Analysis (CCC Waitlist)



## Latent Change Model

Variable	Latent Change Score (Estimate)	Standard Error	<i>p</i>
Anxiety	-6.432	1.140	<.001*
Depression	-3.154	0.440	<.001*
Fighting	-5.548	1.531	<.001*
Stuck	-4.616	0.970	<.001*
Autopilot	-6.085	2.037	.003*
Disconnected	-4.240	0.892	<.001*

## Random Slope Model

Variable	Latent Change Score (Estimate)	Standard Error	<i>p</i>
Anxiety	-0.686	0.110	<.001*
Depression	-0.270	0.088	.002*
Fighting	-0.550	0.176	.002*
Stuck	-0.478	0.069	<.001*
Autopilot	-0.753	0.236	.001*
Disconnected	-0.434	0.150	.004*

# Results: Qualitative findings



- "I'm not in therapy everyday, but I always use this app every day (...) it's simple and easy to use. It wasn't very time consuming. It did exactly what it was supposed to do."
- "I've come so far with this app stuff. It's really helped me with stepping back from thoughts in particular."
- "This app opened up a whole new world for me. I learned to open up to the stuff that was painful in my life"
- "Just being prompted throughout the day cued me to engage in ACT skills even when feeling depressed or anxious."
- "It got repetitive at times, but because it was repetitive I learned the skills and used them in the moment. Now I don't need to fill anything out because I know which skills work for me. I don't need to rely on the app anymore."



# Summary



## Pre-post assessments:

- Large effect sizes than typical face-to-face therapy alone
  - *EMI apps could improve face-to-face therapy*
  - *Also appear to be useful as standalone program*
- Most ACT processes improved (values, defusion, acceptance) and psychological flexibility
- Minimal engagement required (1-2 skills per day)

## **EMI data:**

- All of the variables improved significantly from pre to post (i.e., participants noted significant changes in the moment directly after using a skill)
- Practice effects were observed within the Waitlist group, but not in the Adjunctive group.

# Limitations & Future Directions



- Preliminary results, low  $N$  with participants (paired samples t-tests)
- Applying for more funding for the next iteration of the app
- Introduce client feedback / monitoring of progress
- How do we get more clinicians involved?
  - Potential to create future apps in an iterative design in cooperation with clinicians.
- How do we bridge the gap between the rapid development of technology and more traditional research processes?
- RCT with other online interventions

# More points



- Keep it simple
- Leverage the mobility and quick use of apps
- Bridge the gap between knowing a skill and actually using it in the moment.
- Adjunctive:
  - Potentially frees up more time to engage experientially in session.
  - Generalize skills to real life.
  - Many of our clients want additional support between sessions but barriers arise.
- Self-help:
  - Can be disseminated with a brief training
  - It provides an access point
  - Lower engagement (1/2 as much as adjunctive)
- How would *you* use a mobile app if you were the client?

# Contact



- Jack Haeger
  - [Jack.Haeger@aggiemail.usu.edu](mailto:Jack.Haeger@aggiemail.usu.edu)
  - <http://www.usucbs.com/>

# Future analyses



- Hierarchical linear models (HLM) where modelling the clustering of scores within participants and incorporate continuous-time, first-order autoregressive error structure
- Working on setting up a model to analyze both
  - A) Time points where pre and post-tests have been completed
  - B) time points where only pre-assessments were completed.
  - *Minimal literature on handling missing data within EMI approach*

# Values Brainstorming Exercise



Values brainstorming

## 1 Identify a value

Think of a specific value to work on. By values we mean what is important to you about how you act in the world.

Examples ?

In the following pages, you will reflect on how you can bring this value more into your daily actions. If you've done this exercise before, consider trying it with a new value.

... NEXT >

Saving screenshot...

### Examples

- Compassion
- Growing as a person
- Adventure
- Connecting with others
- Having fun
- Respecting others
- Being healthy
- Openness to new experiences
- Taking on difficult challenges
- Being genuine

X

... NEXT >

Values brainstorming

## 2 Brainstorm possible valued activities

Think of all the possible things you could do that would be in line with this value. Making a list of meaningful activities in your mind. Consider:

- Small, everyday actions (actions don't have to be big to be meaningful)
- Things you are already doing which might fit with the value
- If you were feeling more confident/happier and less depressed/anxious, what would you do?
- Things you used to do that mattered to you.

Examples ?

< PREV ... NEXT >

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### Examples

Value of growing as a person:

- reading a new book
- exercising
- taking a weekend trip
- going hiking
- watching a documentary
- making up with someone you've been fighting with
- meditating
- going to a community event
- starting a new hobby
- calling a friend
- taking a class

X

< PREV ... NEXT >

Values brainstorming

## 3 Pick an action to work on

Now pick one of these activities you can do today, maybe even right now, that would be linked to that value.

Consider putting it in your calendar app or somewhere else on your phone or writing it down.

☑ *Don't forget the post assessment!*