



# Leveraging Positive Psychology to Support Addictive Behavior Change: Why and How

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# Recovery Bulletin



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## THE RECOVERY BULLETIN

FOLLOW US ON:



April is Alcohol Awareness Month

April is Alcohol Awareness Month. Sponsored by the National Council on Alcohol and Drug Dependence (NCADD), Alcohol Awareness Month began in 1987 to increase the public's understanding of hazardous alcohol use and alcohol use disorder, and to reduce the stigma that often comes along with these conditions. In recognition of this critical public health initiative, at the Recovery Research Institute, we wanted to pass along five important, but potentially lesser known facts about alcohol and its impact on society that are grounded in scientific research. We hope it sparks thinking and conversation about the role of alcohol in your life and the lives of those you care about.



- Monthly newsletter via email
- Breaks down 8 recent recovery science findings
- Provides links to original papers
- Discusses implications for
  - Individuals and families seeking recovery
  - Treatment professionals and treatment systems
  - Scientists
  - Policy makers

# Recovery Bulletin - Search it!

The screenshot shows the Recovery Research Institute website's search results page. The header includes a search bar, navigation links for 'BULLETIN SIGN-UP', 'CONTACT', 'DONATE', and 'PARTICIPATE', and a main menu with categories like 'ADDICTIONARY™', 'ADDICTION', 'RECOVERY', 'RESEARCH', 'MULTIMEDIA', 'NEWS AND OPINIONS', and 'ABOUT'. The search results are titled 'Results for "happiness"' and are organized into a grid of six items. Each item includes a category label (RESEARCH or PAGES), a title, and a 'READ MORE' link.

Category	Title	Link
RESEARCH	Five do-it-yourself exercises to improve how happy you feel right now—do they work?	<a href="#">READ MORE</a>
RESEARCH	Increasing the Years Increases the Happiness	<a href="#">READ MORE</a>
RESEARCH	Opioid Use Disorder Medications: What We (Don't) Know About Day-to-Day Functioning	<a href="#">READ MORE</a>
RESEARCH	Lost in Translation: Does regular misuse of prescription opioids affect one's ability to understand others' emotions?	
RESEARCH	Former Problem Marijuana Users Start Young, But Quit Young Too	
PAGES	Addictionary™	

- Huh, not a lot of happiness research here ....

# Why target happiness?

**Toward a New Recovery Movement:  
Historical Reflections on Recovery, Treatment and Advocacy<sup>1</sup>**

William L. White<sup>2</sup>

Prepared for the Center for Substance Abuse Treatment<sup>3</sup>

Recovery Community Support Program Conference,

“Working Together for Recovery”

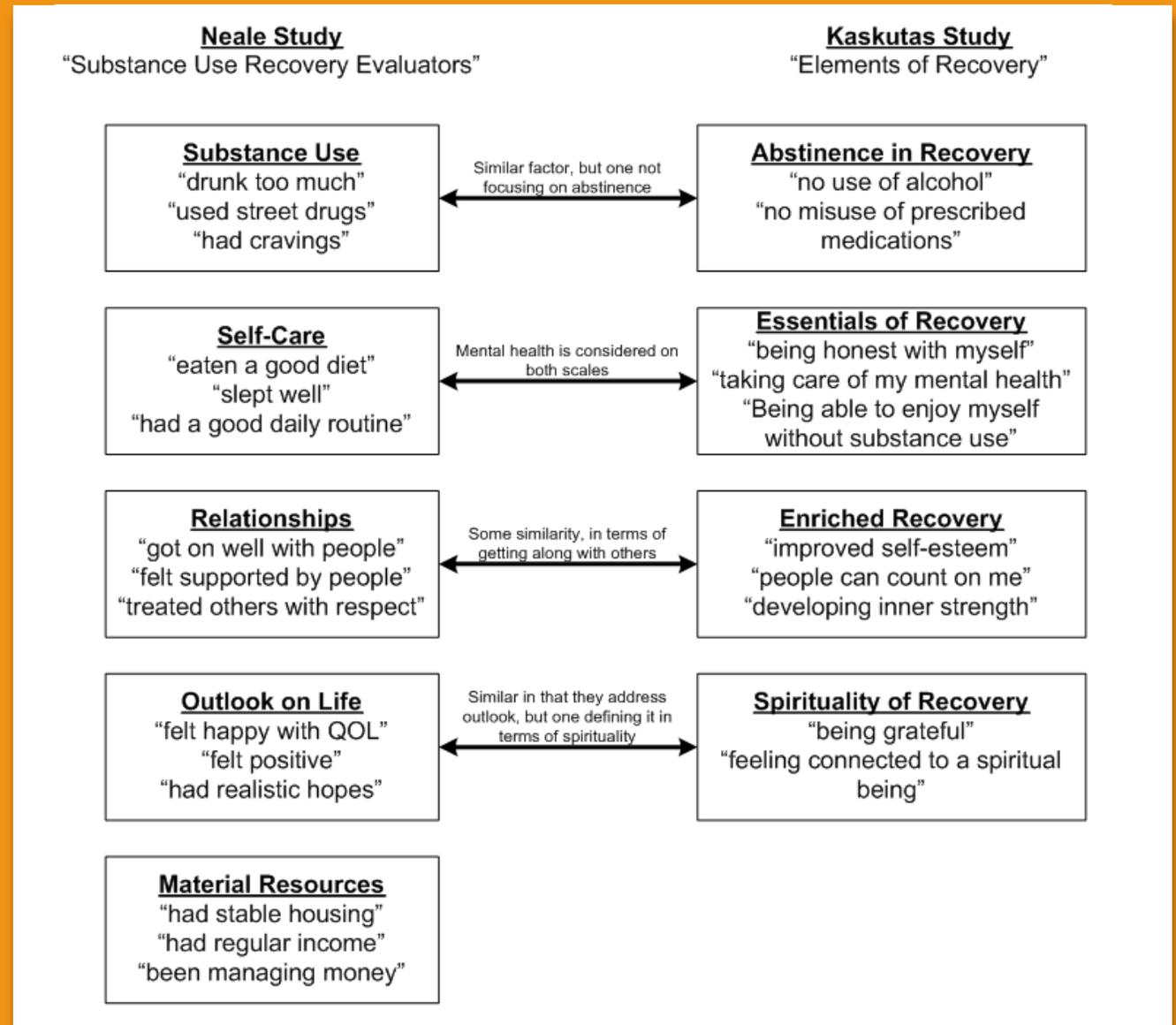
April 3-5, 2000

Arlington, Virginia

- Recovery Movement
  - Expressed goals of recovery include finding **inner peace**, improving **social connections** and **mental health**, learning to **enjoy life** without substance use, and **personal growth** (based on a survey of 9,341 individuals; Kaskutas, 2014)
- Since then,
  - Scientists have increasingly argued that the substance use treatment field needs to **move beyond a focus on reducing or eliminating substance use**

# Sidebar: Defining ‘Recovery’

- How exactly to define ‘recovery’ is garnering much attention
- Two studies
  - Kaskutas: survey study of 9,341 individuals who defined themselves as being in recovery
    - Researchers generated a list of elements
    - Individuals in recovery were asked if elements belonged in their definition of ‘recovery’
  - Neale: A series of staged focus groups to generate and refine items, followed by two formal, large sample evaluation studies
    - Treatment providers generated the list
    - SUD service users refined the list
- NIH has interest in defining it better
  - NIAAA: Understanding recovery better
  - NIDA: As an FDA outcome measure



Neale, J., Vitoratou, S., Finch, E., Lennon, P., Mitcheson, L., Panebianco, D., . . . Marsden, J. (2016). Development and Validation of ‘Sure’: A Patient Reported Outcome Measure (Prom) for Recovery from Drug and Alcohol Dependence. *Drug Alcohol Depend*, 165, 159-167. doi:10.1016/j.drugalcdep.2016.06.006

# Progress to Date?

- Assessment?
  - **Yes** - multiple expert panels and review papers have forwarded the recommendation that quality of life indices and other indices beyond substance use should be routinely assessed and reported (Tiffany, Friedman, Greenfield, Hasin, & Jackson, 2012)
- Outcome?
  - **Somewhat** - efforts are underway to measure 'recovery', so that this measurement could be used to track patient progress and/or to evaluate treatment programs
    - Quality of Life (QOL) indices are increasingly proposed to be part of that
- Treatment?
  - **Not so much as of yet**

# Why focus on happiness during treatment?

**ADDICTION** **SSA** SOCIETY FOR THE STUDY OF ADDICTION  
**ADDICTION DEBATE** doi:10.1111/add.13502

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## **Making the hard work of recovery more attractive for those with substance use disorders**

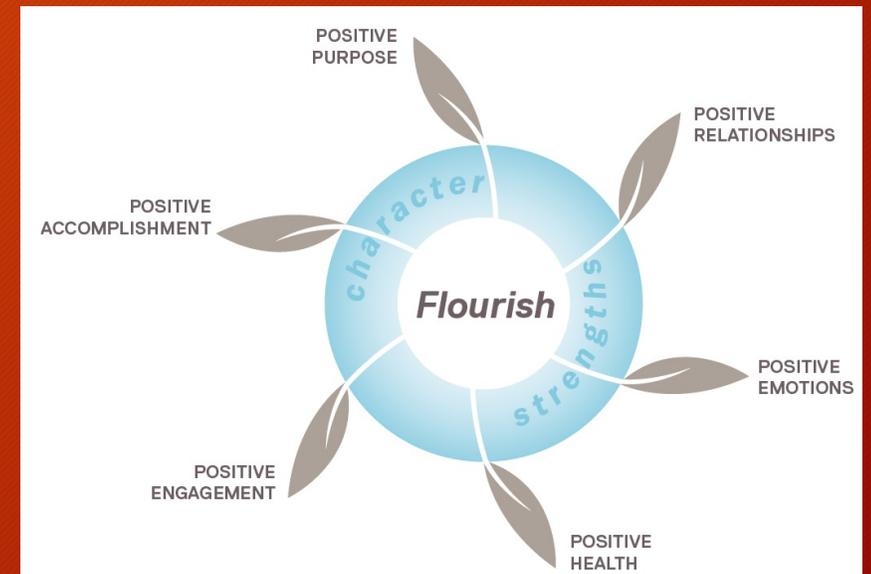
**James R. McKay<sup>1,2</sup>**

Department of Psychiatry, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, USA<sup>1</sup> and Crescenz Veterans Affairs Medical Center, Philadelphia, PA, USA<sup>2</sup>

- “... treatments should go beyond a focus on reducing or eliminating substance use to target greater access to and more time spent in experiences that will be enjoyable or otherwise rewarding ...”

# Positive Psychology

- There is an entire research field devoted to understanding and promoting human flourishing- the area of positive psychology (Seligman & Csikszentmihalyi, 2000)
- Within this field, studies have been conducted to enhance and sustain the experience of happiness.
- These studies have led to the creation of positive psychology exercises, the explicit goal of which is to increase happiness.



# What's the Evidence?

- Meta analysis
  - k=51 studies
  - n=4,266 participants
- Outcomes
  - Improvements in overall well-being ( $r=0.29$ )
  - Reductions in depression ( $r=-0.31$ )
- Conclusion
  - Enhancing positive affect with brief, self-administered exercises is entirely feasible

Sin, N. L., & Lyubomirsky, S. (2009). Enhancing well-being and alleviating depressive symptoms with positive psychology interventions: a practice-friendly meta-analysis. *J Clin Psychol*, 65(5), 467-487. doi:10.1002/jclp.20593

# Are these gains sustainable?

- Meta analysis
  - k=39 studies
  - n=6,139 participants
- Outcomes
  - Improvements in subjective well-being remained evident 3 to 6 months later Conclusion
- Conclusion
  - Yes!

Bolier, L., Haverman, M., Westerhof, G. J., Riper, H., Smit, F., & Bohlmeijer, E. (2013). Positive psychology interventions: a meta-analysis of randomized controlled studies. *BMC Public Health*, 13, 119. doi:10.1186/1471-2458-13-119

# Don't take my word for it

- Search



Positive psychology interventions: a meta-analysis of randomized controlled studies

Articles  Case law

Google Scholar

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Articles

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Since 2019  
Since 2018  
Since 2015  
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[HTML] Positive psychology interventions: a meta-analysis of randomized controlled studies

L Bolier, M Haverman... - BMC public ..., 2013 - bmcpublichealth.biomedcentral.com

The use of positive psychological interventions may be considered as a complementary strategy in mental health promotion and treatment. The present article constitutes a meta-analytical study of the effectiveness of positive psychology interventions for the general public and for individuals with specific psychosocial problems. We conducted a systematic literature search using PubMed, PsychInfo, the Cochrane register, and manual searches. Forty articles, describing 39 studies, totaling 6,139 participants, met the criteria for inclusion ...

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### Positive psychology interventions: a meta-analysis of randomized controlled studies

Linda Bolier , Merel Haverman, Gerben J Westerhof, Heleen Riper, Filip Smit and Ernst Bohlmeijer

BMC Public Health 2013 13:119  
<https://doi.org/10.1186/1471-2458-13-119> | © Bolier et al; licensee BioMed Central Ltd. 2013  
Received: 22 June 2012 | Accepted: 29 January 2013 | Published: 8 February 2013

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#### Abstract

**Background**

The use of positive psychological interventions may be considered as a complementary strategy in mental health promotion and treatment. The present article constitutes a meta-analytical study of the effectiveness of

- Read

# So why don't we leverage that?

- **Siloed**
- Resnick, 2006: “Although the underlying philosophies and goals of the recovery movement and positive psychology are similar, two differences have kept them from intersecting. ”
- Krentzman, 2013: “The two movements have existed side-by-side with minimal crosspollination.”

Open Forum

## Recovery and Positive Psychology: Parallel Themes and Potential Synergies

Sandra G. Resnick, Ph.D.  
Robert A. Rosenheck, M.D.

The positive psychology movement studies the sources of human character strengths. A growing number of consumers encourage involvement by nonconsumers. Thus an ori-

Psychology of Addictive Behaviors  
2013, Vol. 27, No. 1, 151–165

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0893-164X/13/\$12.00 DOI: 10.1037/a0029897

## Review of the Application of Positive Psychology to Substance Use, Addiction, and Recovery Research

Amy R. Krentzman  
University of Michigan Addiction Research Center

Advances in positive psychology have grown exponentially over the past decade. The addictions field has experienced its own growth in a positive direction, embodied by the recovery movement. Despite parallel developments, and great momentum on both sides, there has been little crosspollination. This article

# Two Differences (Resnick & Rosenheck, 2006)

- **Difference #1**

- In establishing the field of positive psychology, a dichotomy was invoked: that psychology must pay as much attention to “fulfilling the lives of healthy people as to healing the wounds of the distressed” (Peterson & Park, 2003)
  - That implies that “only “healthy” people will benefit from a psychology of strengths, while “distressed” people will continue to require “negative psychology” ”

- **Difference #2**

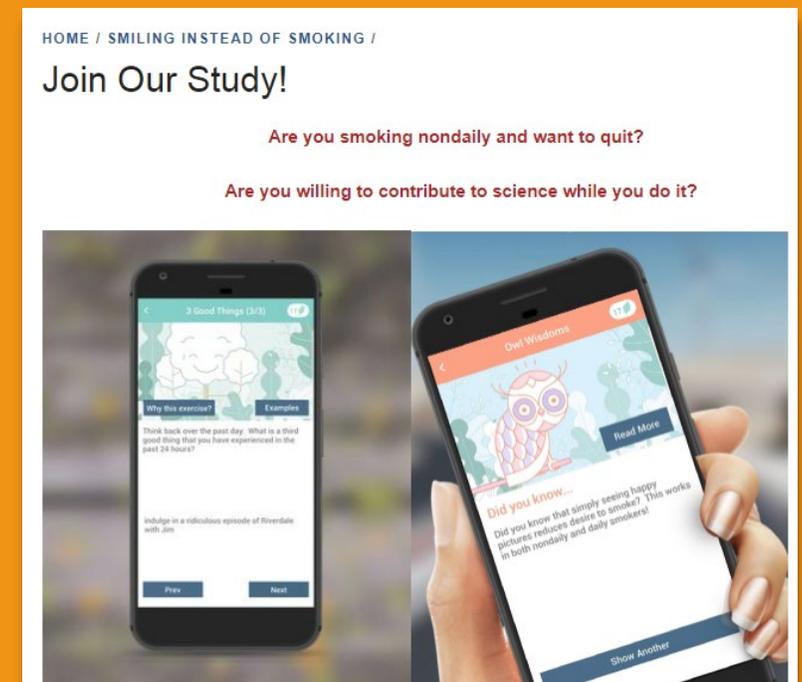
- “Positive psychology is centered on empirical research, whereas the recovery movement, ... has placed itself distinctly apart from the human service professions, the academy, and the empirical research tradition.”

# Can positive psychology be used to support health behavior change?

- Positive psychology interventions (PPIs) have been successfully implemented to facilitate health behavior change in the areas of
  - Smoking cessation
  - Chronic pain management
  - Treatment of cardiovascular disease

# Smoking Cessation

- Positive emotion during smoking cessation has been shown to increase an individual's likelihood of successfully quitting smoking
- Positive psychology based interventions have been developed for in-person and smartphone app delivery
  - Jury is still out on their effectiveness
    - In-person: <http://quitwithbrown.org/>
    - Smartphone app: <https://scholar.harvard.edu/bettina.hoepfner/join-our-study>



# Chronic Pain Management

- In chronic pain sufferers, the induction of positive mood states using PPIs is associated with
  - decreased bodily pain
  - increased pain tolerance



# Treatment of Cardiovascular Disease

- In cardiac patients needing to increase physical exercise,
  - Positive psychological traits have been found to be associated with more positive cardiac outcomes in patients with heart disease.
  - Patients have also reported a **great liking of PPIs**
  - The use of PPIs has been linked prospectively with increased cardiac health behaviors.

The  
Harvard  
Gazette

HEALTH & MEDICINE

## The grateful life may be a longer one



# What do we know about positive experience and substance use?

- **Not a lot, but promising**
- The experience of positive emotions,
  - Has been linked to resilience
  - May act as a buffer against family conflict, parental or peer substance use
  - May help rebuild a life outside of substance use.
- Well-being has been found to be associated with **fewer relapses** in persons in a residential treatment program for addiction (*cross-sectionally, so cause-and-effect is unclear*)
- Longitudinally, higher life satisfaction has been linked with a **greater chance of remission 1-2 years later**

Alim TN, Lawson WB, Feder A, et al. Resilience to meet the challenge of addiction: psychobiology and clinical considerations. *Alcohol research: current reviews*. 2012;34(4):506.

Mohatt GV, Rasmus SM, Thomas L, Allen J, Hazel K, Marlatt GA. Risk, resilience, and natural recovery: a model of recovery from alcohol abuse for Alaska Natives. *Addiction*. 2008;103(2):205-215.

Zand A, Shams J, Shakeri N-h, Chatr-Zarrin F. The Relationship between Well-Being and Substance Abuse Relapse. *Pejouhesh dar Pezeshki (Research in Medicine)*. 2017;41(1):31-36.

# What about supporting behavioral change in the area of problematic substance use?

- Is it feasible?
  - The transition away from problematic substance use represents a particularly **challenging time**, and thus, is perhaps a time during which exercises designed to engender an awareness of the good things in life could instead serve as a **reminder of things that are lost** or lacking
- Three pilot studies
  - 20 adolescents attending an alcohol and drug treatment service
  - 23 outpatients in a treatment program for alcohol use disorder
  - 21 methamphetamine-using men who have sex

# Akhtar & Boniwell, 2010

- 20 adolescents attending alcohol and drug treatment service
- Randomized to receive
  - **Eight weekly workshops** based on positive psychology models including happiness, strengths, optimism and gratitude
  - versus no treatment
- Results
  - **Increase in subjective happiness and decrease in alcohol consumption** in the treatment but not the control group

Session	Zones	Principal Themes
Week 1	Feel Good Zone	Positive Emotions, Savouring
Week 2	Future Zone	Gratitude, Optimism
Week 3	Me Zone	Strengths
Week 4	Chill Zone	Relaxation, Meditation
Week 5	Change Zone	Change, Goal-setting
Week 6	Me to You Zone	Relationships
Week 7	Body Zone	Nutrition, Physical Activity
Week 8	Bounce back Zone	Resilience, Growth Mindset

# Krentzman et al., 2015

- Design

- 23 outpatients in a treatment program for alcohol use disorder
- Daily emails for 2 weeks
- Randomized

- Results

- 91% of participants completing the exercise daily
- Decrease in negative affect
- Increased experience of the calm and peaceful dimensions of positive affect

Table 2. Six open-ended questions administered daily for 14 days via web-based survey.

	Treatment (TGT) (Seligman et al., 2005)	Control (placebo sleep hygiene questions)
Instructions	Please describe three good things that happened to you in the past 24 h	Please describe the nature of your sleep over the past 24 h
Question 1	Description of the first good thing that happened in the past 24 h	In the past 24 h, please describe exactly when and where you dozed off, fell asleep, napped, or slept for any length of time
Question 2	What was its cause? (What made this happen?)	If you engaged in any kind of exercise, including light exercise, in the past 24 h, what did you do? When during the day did you exercise?
Question 3	Description of the second good thing that happened in the past 24 h	During the past 24 h, what kinds of caffeinated products (coffee, tea, soda, chocolate) did you have, if any, and about how much of each did you have?
Question 4	What was its cause? (What made this happen?)	While you were sleeping at any time over the past 24 h, was anything on (computers, lights, TV, stereo)? If so, what was on while you were sleeping?
Question 5	Description of the third good thing that happened in the past 24 h	Please describe what you were doing in the hour before you last fell asleep
Question 6	What was its cause? (What made this happen?)	Please describe what you did in the first hour after your final awakening

# Carrico et al., 2015

- Design
  - 21 methamphetamine-using men who have sex with men
  - Adding a 5-session positive affect component to contingency management
  - Randomized
- Results
  - High treatment completion (98%)
  - Increases in positive affect over short term (2 months), but not long term (6-months)

Positive affect regulation skills

Noticing positive events

Capitalizing on positive events

Gratitude

Mindfulness (informal and formal)

Positive reappraisal

Strengths

Attainable goals

Altruism

That's all nice and well, Dr. Hoeppe, but ...

... did YOU actually contribute anything here?

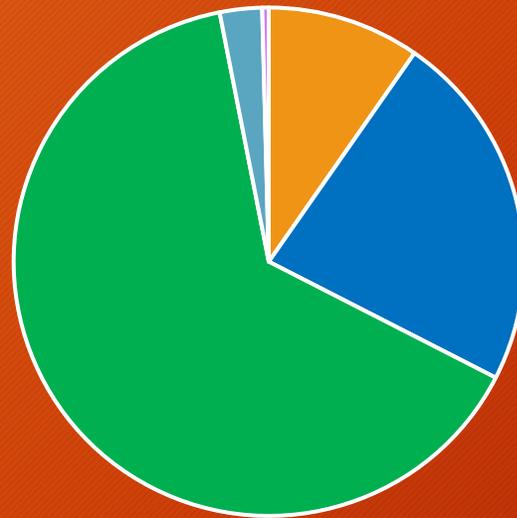
# Recovery Happiness Survey

- Online survey
  - 531 adults describing themselves as seeking or being in recovery from problematic substance use
  - Recruited from recovery-support social network sites, Craigslist, RRI, Rally
- Questions:
  - “What role do you think happiness plays in recovery?”
    - A goal
    - A pathway
    - Goal and pathway
    - Not relevant
    - Hindering
  - “How important is your happiness to your recovery process?”

Variable	Happiness Exercise (n=376)	Neutral/Negative Exercise (n=155)
Age, years, M(SD)	51.0 (12.7)	50.7 (12.4)
Female, % (n)	66 (204)	64 (86)
Race, % (n)		
White, non-Hispanic	90 (279)	93 (125)
White, Hispanic	0 (0)	0 (0)
Non-white	10 (30)	7 (9)
Education: College or more, % (n)	58 (183)	57 (77)
Currently in school, % (n)	9 (28)	10 (13)
Employment, % (n)		
Full-time	45 (137)	47 (62)
Part-time	16 (50)	14 (19)
None	39 (118)	39 (52)
Recovery stage, % (n)		
Seeking recovery	10 (36)	15 (24)
In recovery - < 1 month	6 (21)	8 (12)
In recovery - ≥ 1 month, but less than a year	23 (86)	15 (23)
In recovery - ≥ 1 year	48 (179)	51 (79)
In recovery - Unspecified	14 (54)	11 (17)
Primary substance of use, % (n)		
Alcohol	65 (243)	72 (111)
Other substance	17 (64)	14 (21)
Unspecified	18 (66)	14 (22)
Happiness and quality of life indices		
In-the-moment happiness rating, M (SD)	61.8 (23.4)	60.8 (23.6)
Low in-the-moment happiness rating, % (n)	24 (91)	28 (44)
SWLS total score, M (SD)	21.7 (7.4)	20.8 (7.5)
SHS mean score, M (SD)	4.6 (1.4)	4.6 (1.3)

# What role do you think happiness plays in recovery?

Happiness is ...



■ ... a goal of recovery

■ ... a pathway towards recovery

■ ... both a goal and a pathway

■ ... not relevant to recovery

■ ... hindering recovery

# How important is your happiness to your recovery process?

not at all  
important

extremely  
important



80

# Then it got interesting ...

- **Pre:** Asked: “How happy are you feeling right now?”
- **Randomized** to complete one of 7 exercises
  - Happiness Exercises
    - 3 Good Things
    - Experiencing Kindness
    - Savoring
    - Rose, Thorn, and Bud
    - Reliving Happy Moments
  - Control Exercises
    - 3 Things
    - 3 Hard Things (aka, “The Thicket”)
- **Post:** Asked again: “How happy are you feeling right now?”

# 3 Good Things

- Exercise
  - “Think back over the past day. What are three good things that you have experienced in the past 24 hours?”
- Based on
  - Best known positive psychology exercise
  - Shown to have rapid and lasting effects on reducing depressive symptoms and increasing happiness.



# Experiencing Kindness

- Exercise
  - “Think back over the past day. What is one act of kindness that YOU have done in the past 24 hours? What is one act of kindness that you have seen SOMEONE ELSE do in the past 24 hours?”
- Based on
  - Positive psychology research
  - Writing about the “blessings” in one’s life is a particularly effective means of increasing happiness (Lyubomirsky et al., 2005)
  - Simply counting one’s own acts of kindness has been shown to increase happiness (Otake, Shimai, Tanaka-Matsumi, Otsui, & Fredrickson, 2006)



# Savoring

- Exercise
  - “Please describe an experience that you have savored in the past 24 hours. By ‘savored’ we mean a positive experience that you have noticed and appreciated as being a wonderful moment. These experiences can be quite simple, everyday kind of moments. If you didn’t actively savor an experience in the past 24 hours, please describe an experience you will likely have in the next 24 hours that you could savor.”
- Based on
  - Positive psychology research, but not an explicit exercise used before
  - Show to be an important aspect of **sustained happiness**



# Rose, Thorn, & Bud

- Exercise
  - “Thinking back over the past day, what is the BEST thing that you have experienced (your rose), the WORST thing you have experienced (your thorn), and the thing you are most looking forward to in the next 24 hours (your bud)?”
- Based on
  - This exercise is not an exercise put forth by scientists, but rather is an **organically existing, commonly shared exercise** used for self-reflection and mindfulness



# Reliving Happy Moments

- Exercise
  - “Take a minute to browse through the pictures you have saved on your smartphone, on your computer, or have lying around. Find one that brings back a happy memory. What is happening in that picture?”
- Based on
  - Variation of **standard laboratory cue exposure tasks** which expose research participants to affect-inducing pictures drawn from standardized picture sets, such as the IAPS (Lang, Bradley, & Cuthbert, 2008) and OASIS (Kurdi, Lozano, & Banaji, 2017),



# Control Exercises

- Both control exercises were modeled after the “3 Good Things”
  - Neutral: “Think back over the past day. What are three things that you have experienced in the past 24 hours?”
    - Effort to create a theoretically neutral comparison, which acts as an **attention-control without valence**.
  - Negative: “Think back over the past day. What are three experiences that have been hard for you in the past 24 hours?”
    - **Clinically relevant comparison**, because treatment frequently addresses encountered challenges



So what did we find?

# Results

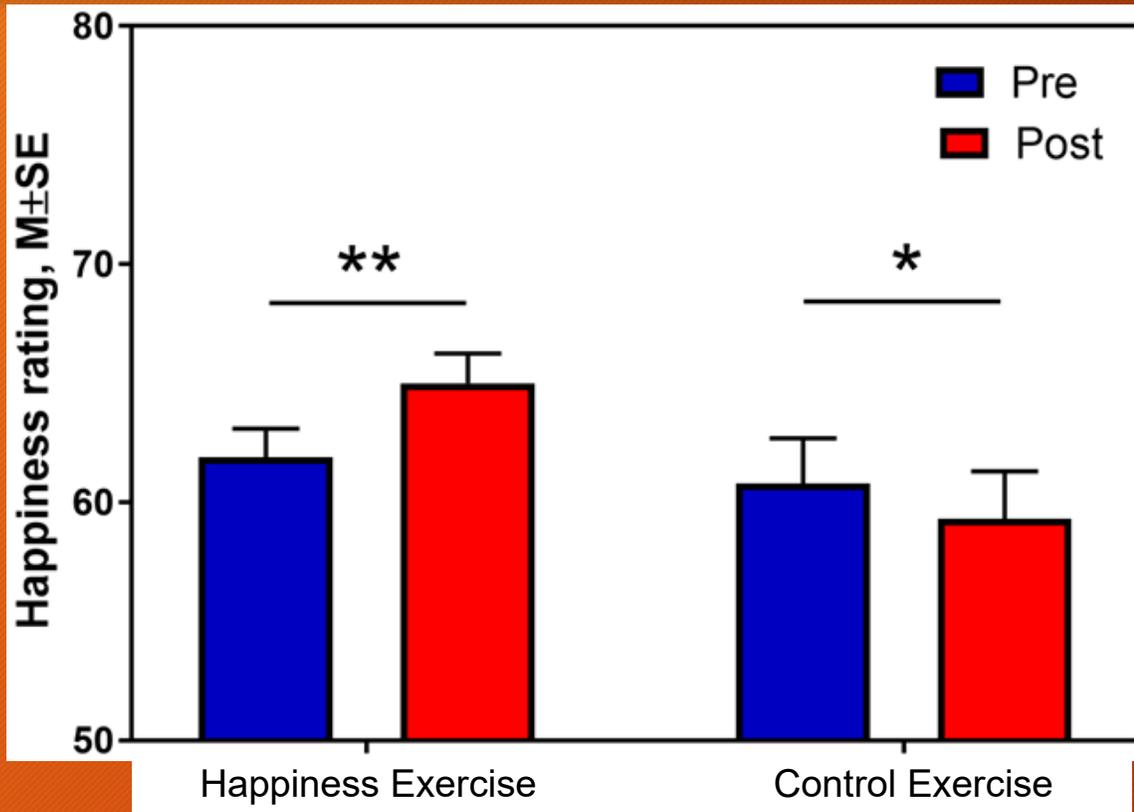
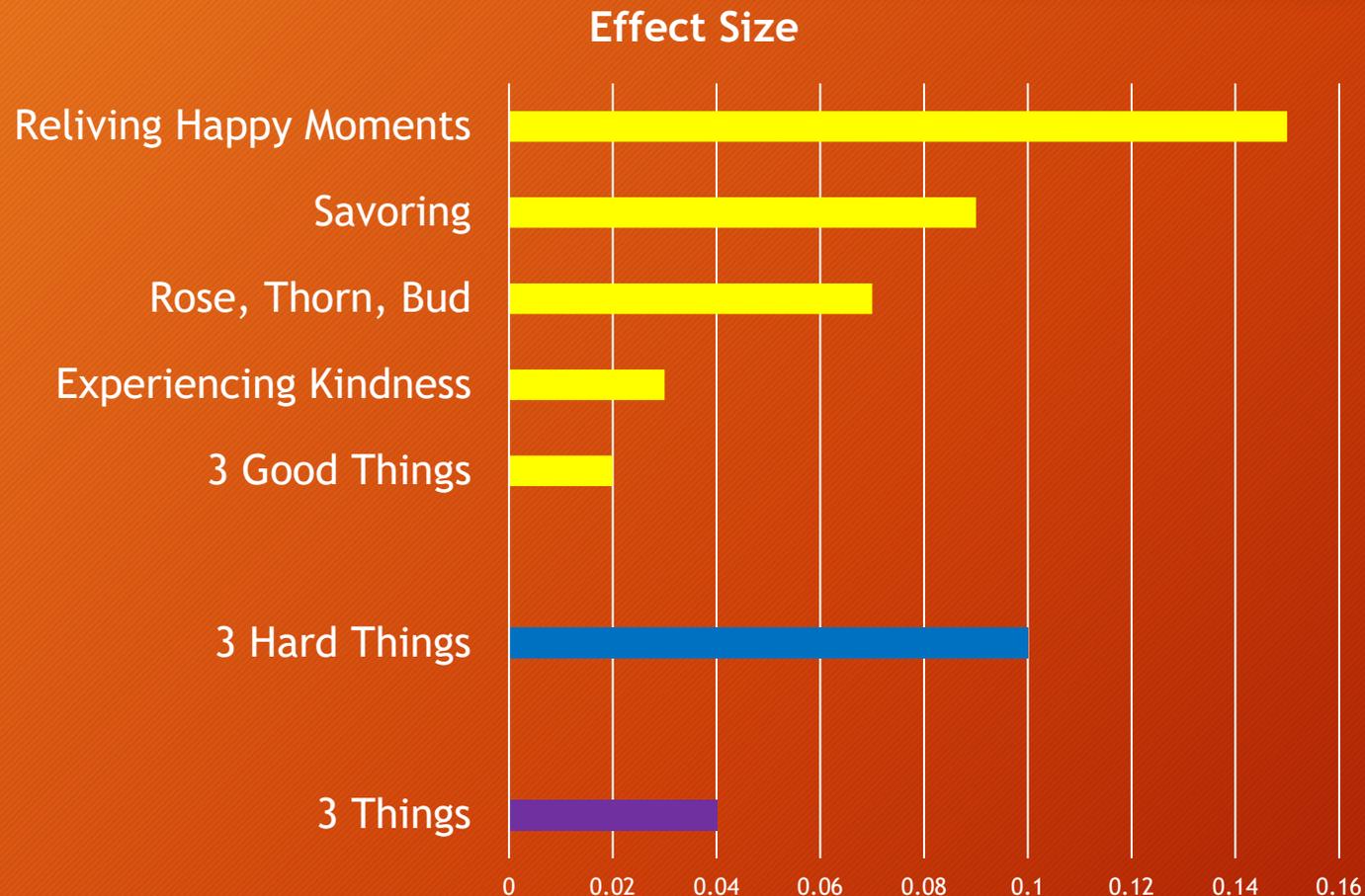


Figure 3. Average happiness ratings immediately before vs. after completing a randomized exercise in persons recovering from heavy substance use (n=531; 67% alcohol)

- Two Things

- In-the-moment happiness increased in participants randomized to happiness exercises
- It decreased in controls

# Which Exercise Worked Best?



- Greatest pre-post increases in happiness for
  - “Reliving Happy Moments” exercise ( $g_{av}=0.15$ )
  - “Savoring” ( $g_{av}=0.09$ )
  - “Rose, Thorn, Bud” ( $g_{av}=0.07$ ).
- Observed decreases in happiness in response to the “3 Hard Things” exercise underscore the importance of offsetting the challenges of recovery with positive experiences.

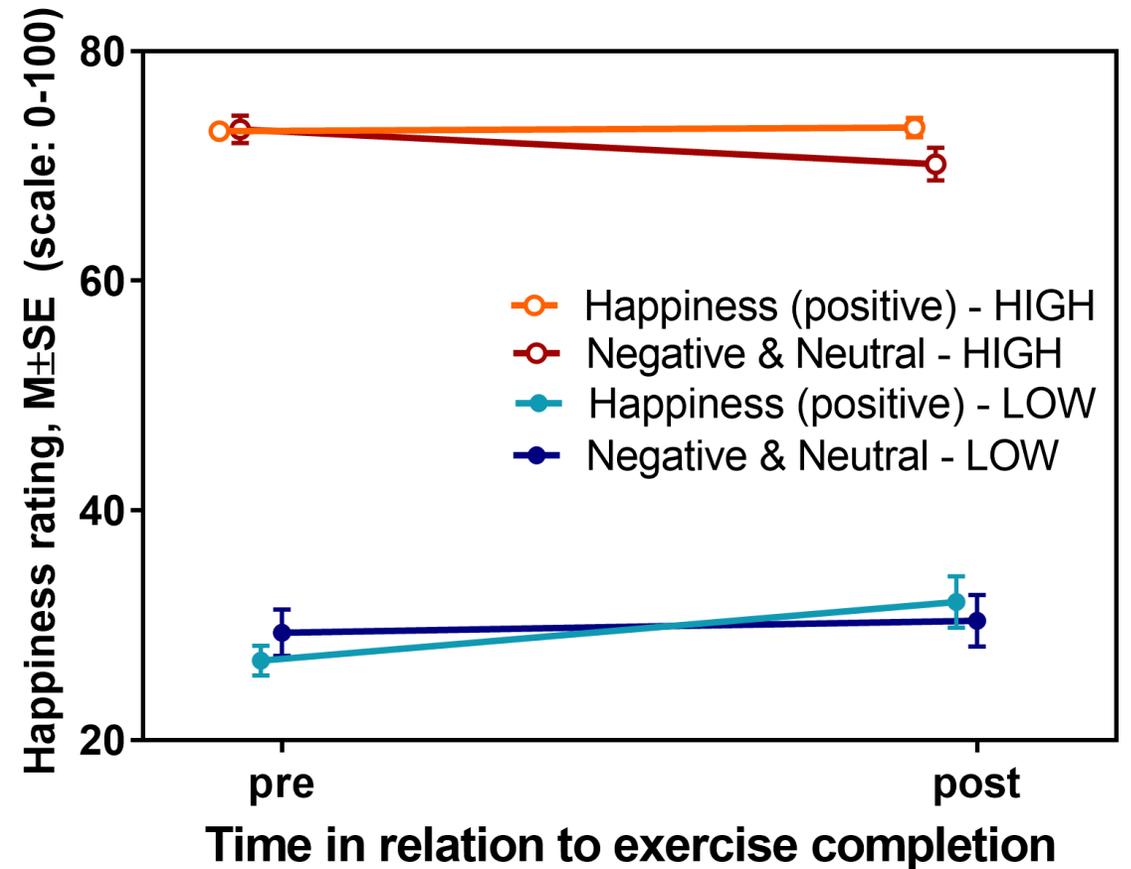
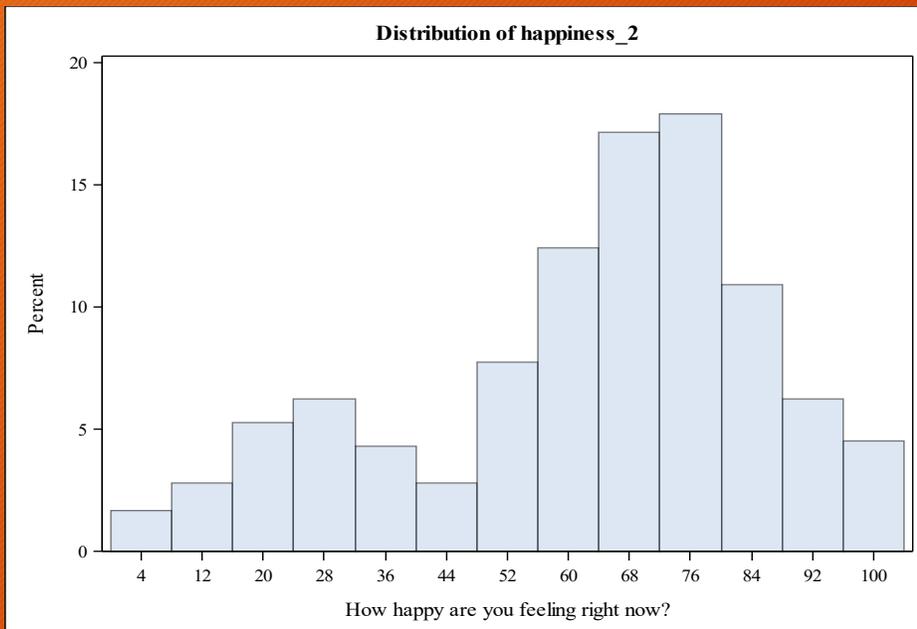
# How doable are these exercises?

## Participants who were randomized to happiness exercises only (n=376)

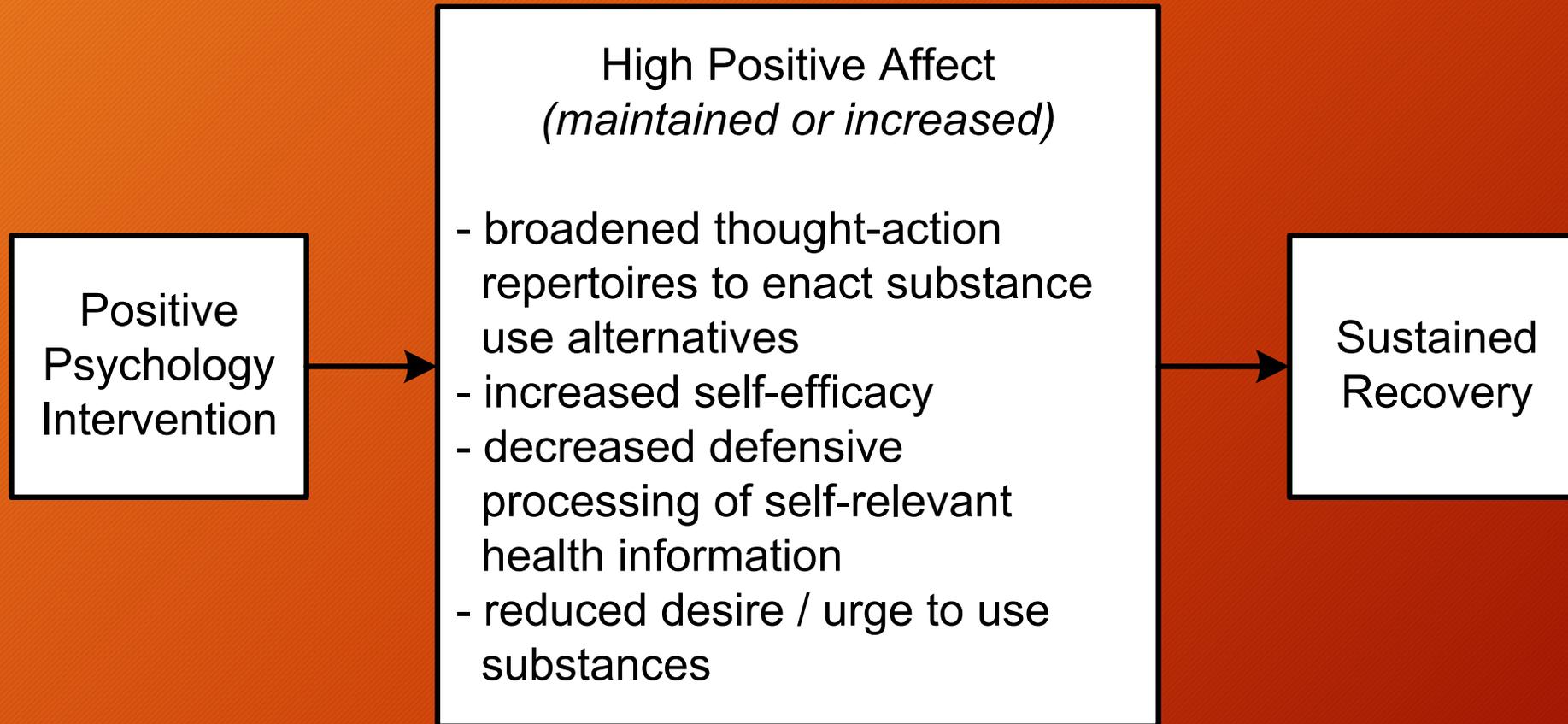
Completed the exercise (at least partly), % (n)	92.0	(346)
Time to complete the exercise, minutes, M(SD) <sup>b</sup>	4.1	(3.0)
Ease of completing the exercise, range 0-100, M(SD) <sup>c</sup>	81.7	(18.7)
Could do an exercise like this as part of their daily routine, % (n)	93.5	(328)
Would do an exercise like this as part of their daily routine		
Yes, for several weeks if not indefinitely, % (n)	32.2	(113)
Yes, for a little while, % (n)	27.4	(96)
Yes, on and off, % (n)	34.2	(120)
No, % (n)	6.3	(22)
Daily exercises could help them to be happier or maintain happiness, % (n) <sup>c</sup>	86.3	(232)

# Do They Only Work for Happy People?

- No, the opposite, actually.



# A Conceptual Model



- Largely based on smoking research

# Measuring the Thought-Action Repertoire

- A little bit harder to measure
- Name the emotion
- Feel the emotion
- List actions
- Then we count them

Now take a moment to think back to the experiences you just described. What is the strongest emotion you felt while recalling those experiences?

Happy

Take a moment to recall experiencing that emotion. Concentrate on all the emotion you felt and live it as vividly and as deeply as possible. Given this feeling, please list all the things you would like to do right now. You can list as many or as few things as come to mind in the lines below.

1. I would like to... run with the puppies

2. I would like to... sit in the sun

3. I would like to... work on my puzzle

4. I would like to... sip a chai

5. I would like to... smell a rose

6. I would like to...

7. I would like to...

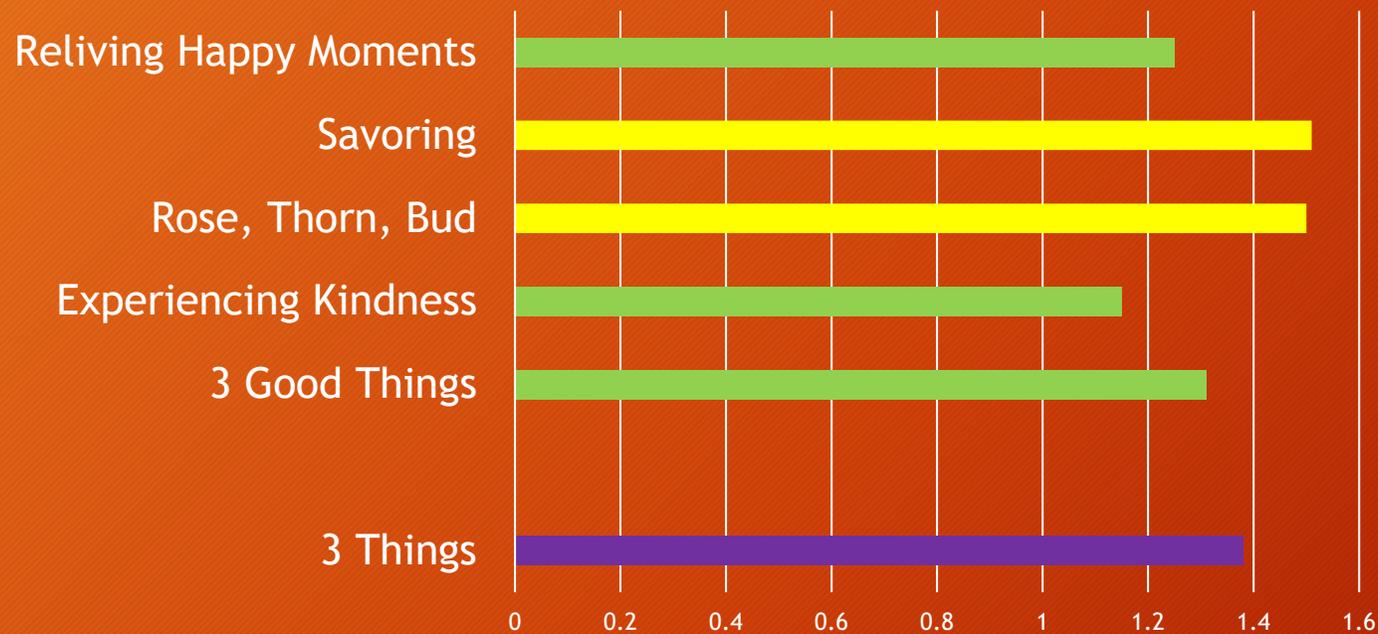
# Losing the Signal in the Noise

- Naming the emotion
  - In the happiness groups, only 66% - 96% of participants named a positive emotion
  - In the neutral group, as many as 59% named a positive emotion
  - Even in the “3 Hard Things” group, 13% named a positive emotion
- Invalid responses
  - “nothing”
  - “I wish I were ...”
  - Being rather than doing (e.g., “be less down”)
  - Passively receiving (e.g., “hear from my friends”)



# Thought-Action Repertoire

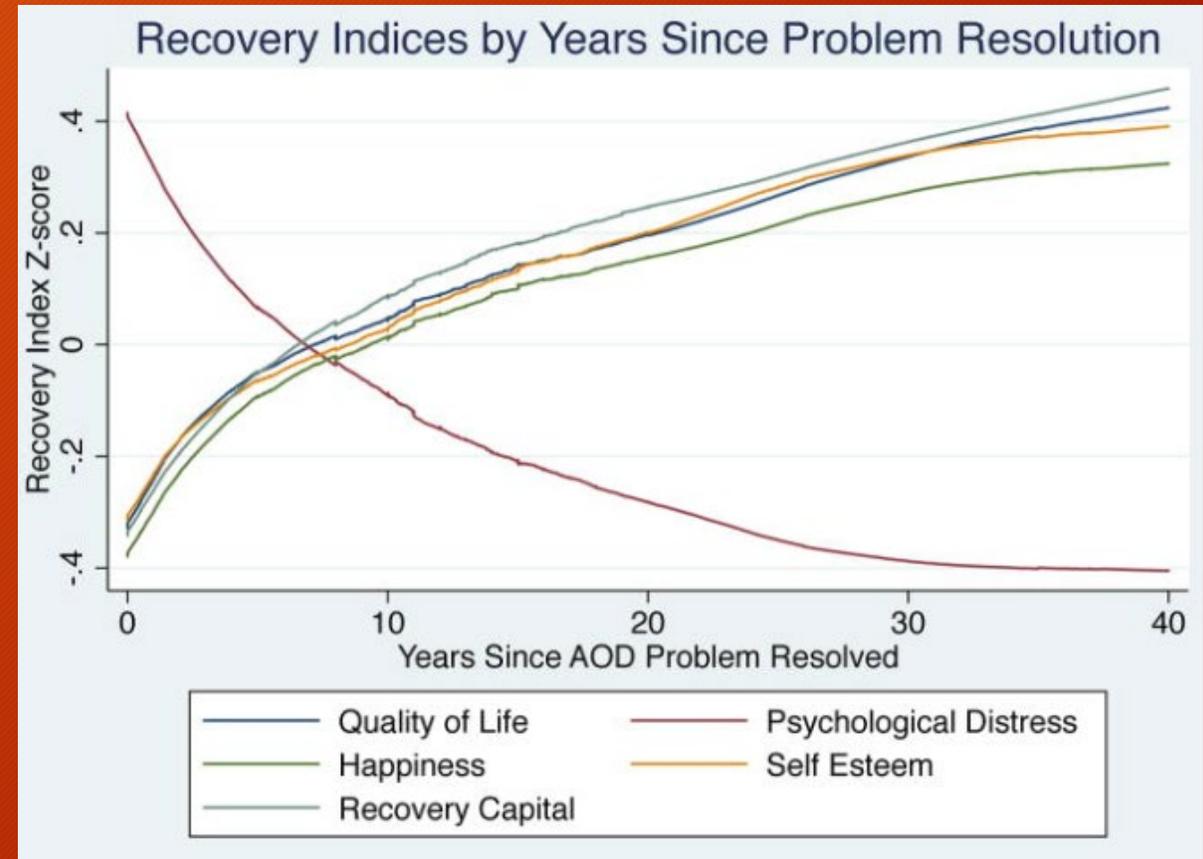
## Compared to "3 Hard Things"



- Still found a signal!
- Keep in mind that 59% in the "3 Things" still thought happy thoughts

# Conclusions

- Happiness exercises seem to work best when
  - Happiness is not at ceiling levels
  - There is a need to counteract expected experiences of negative affect

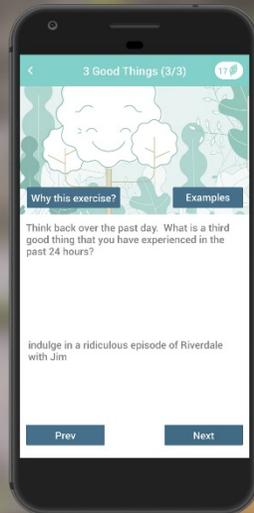


Great! So is this coming  
to a theater near me?

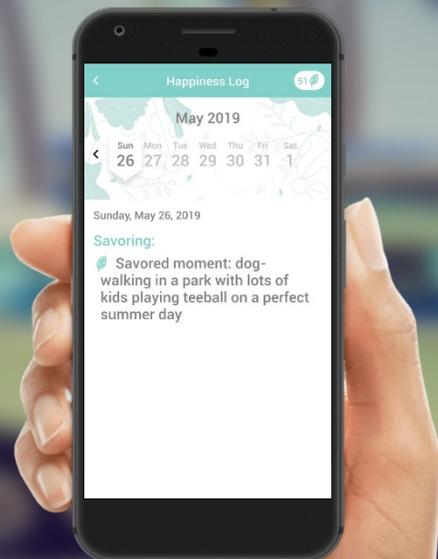
# Yes! The SiS App

- <https://scholar.harvard.edu/bettina.hoeppner/sis>

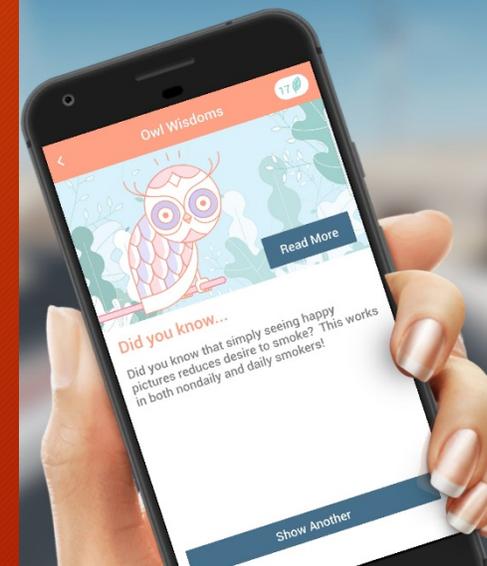
Complete daily  
happiness exercises...



...and in so doing,  
build a log of happy  
experiences.



...and along the way,  
receive science findings  
on why happiness  
matters to health and  
becoming smoke-free.



# Uhm, smoking cessation?

- Tobacco use is a leading cause of preventable death in persons suffering from substance use disorder
- Individuals in treatment for alcohol use disorder who smoke are more likely to die from tobacco use than from alcohol use
- 65-87% of persons with SUD smoke (only 15.5% in the general population)
- Best practice recommendations are to treat smoking cessation during SUD treatment
  - Tobacco use is associated with worsened substance use treatment outcomes
  - Tobacco use is a lethal and ineffective long-term coping strategy for managing stress
  - Treatment of tobacco use does not harm SUD recovery and may in fact even improve SUD treatment outcomes

# SiS Study 1

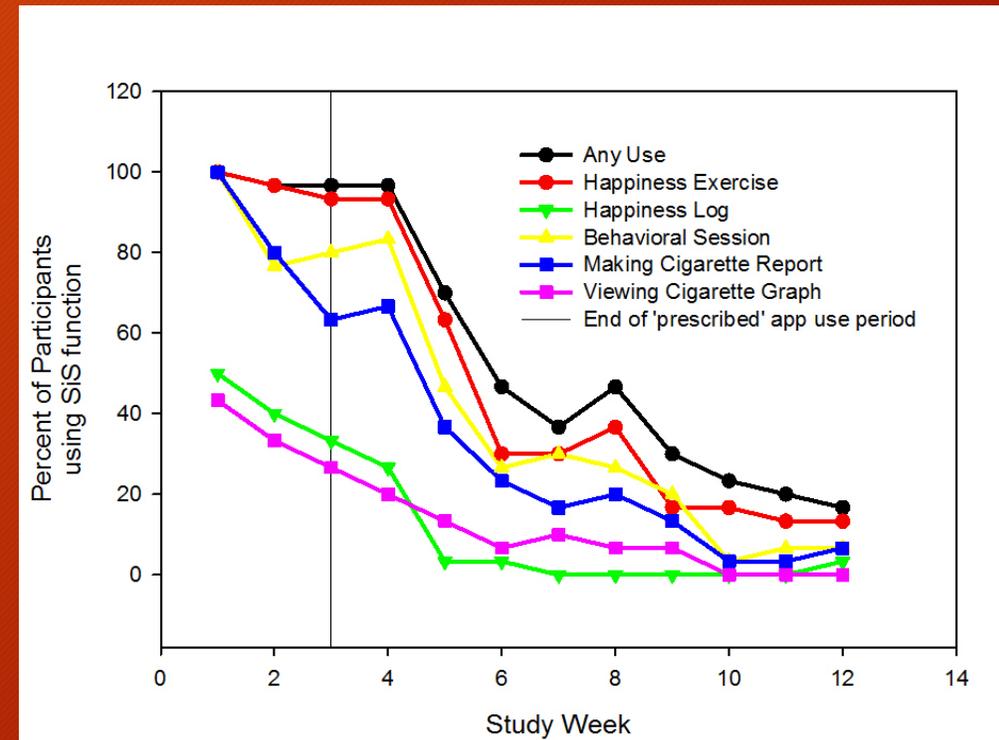
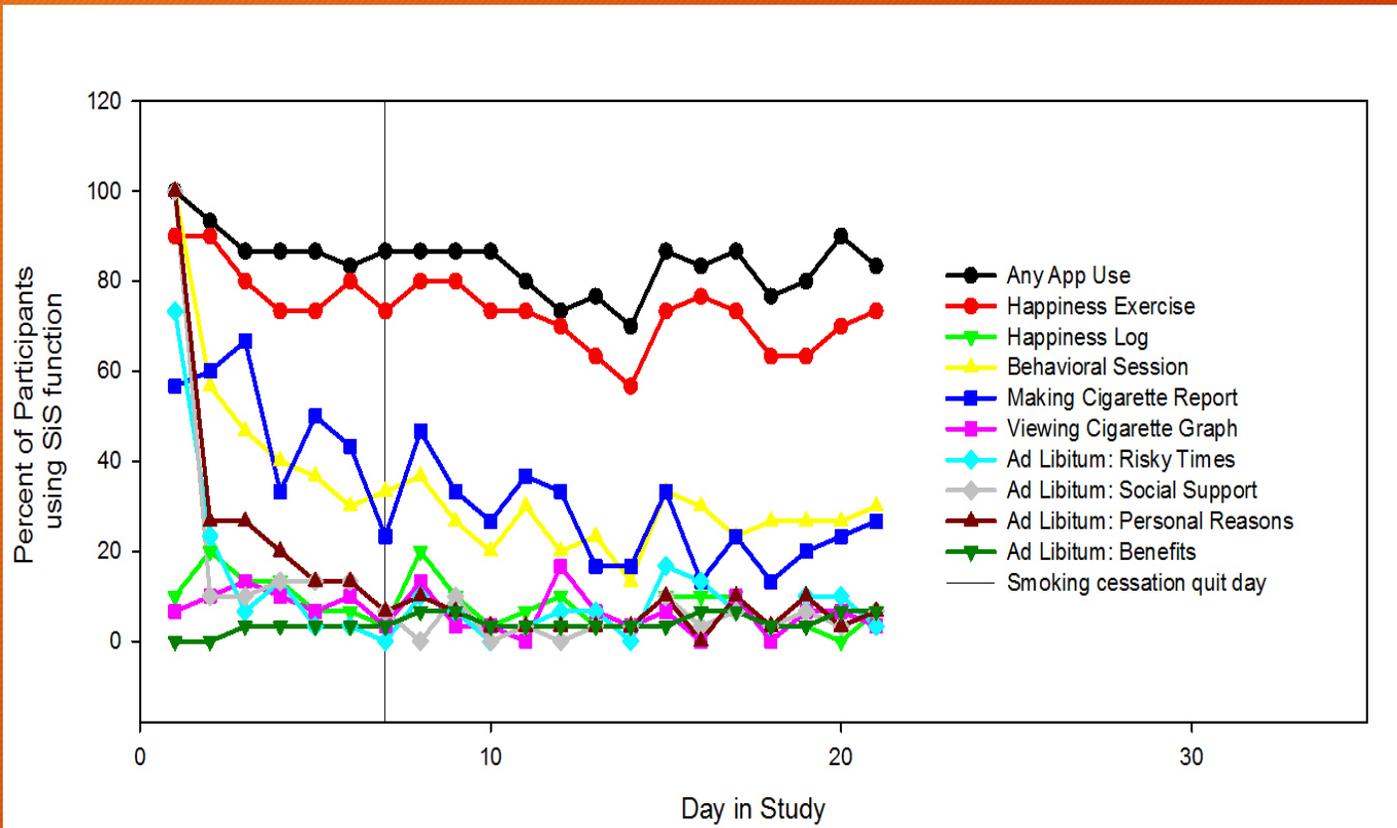
- 30 nondaily smokers
- Used app for 3 weeks
- Completed surveys
  - Baseline
  - Week 2
  - Week 6
  - Month 3
  - Month 6

Hoepfner BB, Hoepfner SS, Carlon HA, Perez G, Helmuth E, Kahler CW, Kelly JF. Feasibility and acceptability of a smartphone app leveraging positive psychology to support smoking cessation in nondaily smokers. JMIR mHealth and uHealth. in press.

Table 1. Sample characteristics (n=30)

	mean/%	(SD/n)
<u>Demographics</u>		
Age	44.7	(14.1)
Gender (% female)	26.7	(8)
Race (in %)		
White	40.0	(12)
Black	43.3	(13)
Other or unknown	16.7	(5)
Hispanic (in %)	6.7	(2)
Education (in %)		
High School or less	26.7	(8)
Some college	36.7	(11)
BA/BS or higher	36.7	(11)
<u>Smoking Characteristics</u>		
# of days smoked in past 30 days	15.6	(6.0)
# of cigs smoked per smoking day	4.5	(2.9)
Ever smoked daily? (% yes)	60.0	(18)
Ever quit before? (% yes)	70.0	(21)

# App Use Over Time



# How did it help?

	mean (SD)	% agree
The app helped remind me to stay on track with quitting.	3.9 (0.9)	83%
The app gave me confidence that I can quit smoking.	3.9 (1.0)	80%
The app made me think that it was worthwhile for me to quit.	4.0 (1.1)	80%
The app made me feel that someone cared if I quit.	3.9 (1.1)	77%
The app reminded me why I wanted to quit.	4.1 (0.8)	77%
The app helped me stay positive while quitting.	3.8 (1.1)	70%
The app gave me the feeling I could get trusted advice at any time.	3.7 (1.1)	70%
The app made me feel that I knew the right steps to take to quit.	3.5 (1.1)	60%
The app motivated me to reach out to the people in my life about quitting.	3.4 (1.2)	57%
The app helped me deal with risky smoking times.	3.5 (1.2)	57%
Taken altogether, do you think that the app helped you in your quit attempt?		90%

Note: rated on a 5-point Likert scale: 1=strongly disagree, 2=disagree, 3=neither agree nor disagree, 4=agree, 5=strongly agree

- 90% said the app had helped them
- Particularly important
  - Reminder to stay on track (83%)
  - Boosting confidence to quit (80%)
  - Reinforcing belief that quitting was worthwhile (80%)

# Impact on Mechanisms of Change

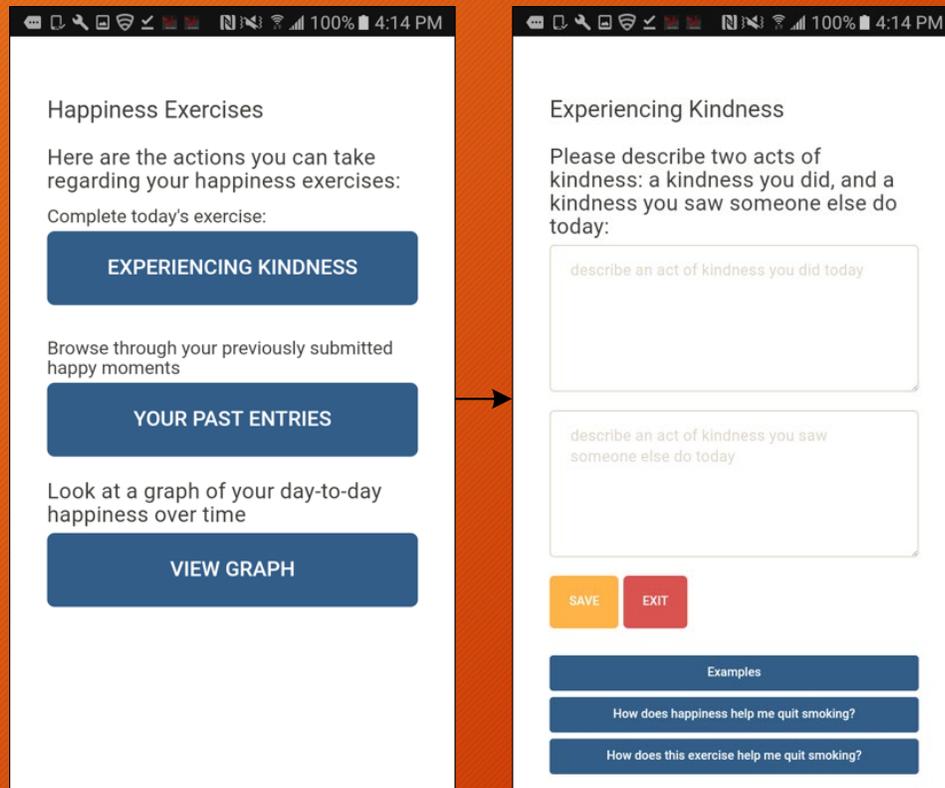
- **Confidence increased** (on a 0-100 scale)
  - internal cues:  $b=16.7$  [95%CI: 7.2,26.3],  $p=.001$
  - external cues:  $b=15.8$  [95%CI: 5.4,26.1],  $p=.004$
- **Urge to smoke decreased** (on a 1-7 scale,  $b=-0.8$  [95%CI: -1.3,-0.3],  $p=.002$ )
- **Perceptions of smoking became less positive**
  - (on a 1-5 scale)
    - psychoactive benefits:  $b=-0.5$  [95%CI: -0.9,-0.2],  $p=0.006$ ;
    - pleasure:  $b=-0.4$  [95%CI: -0.7, -0.01],  $p=.03$ ;
  - on a 0-100 scale,
    - importance of pros of smoking:  $b=-11.3$  [95%CI: -18.9, -3.8],  $p=.004$ ).

# Smoking Cessation

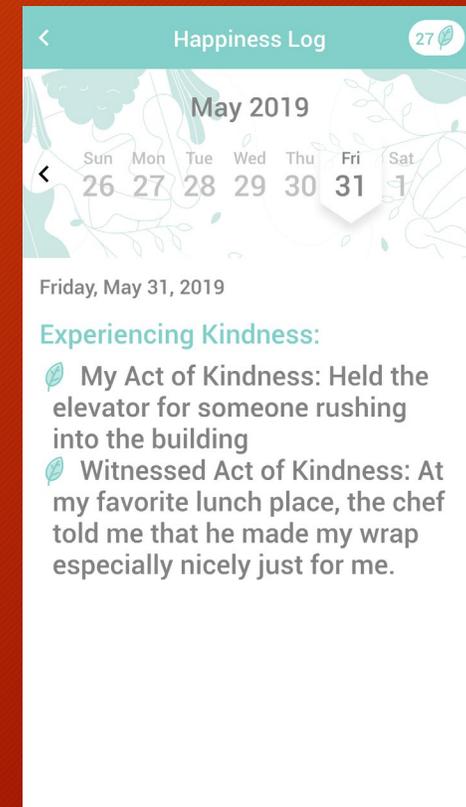
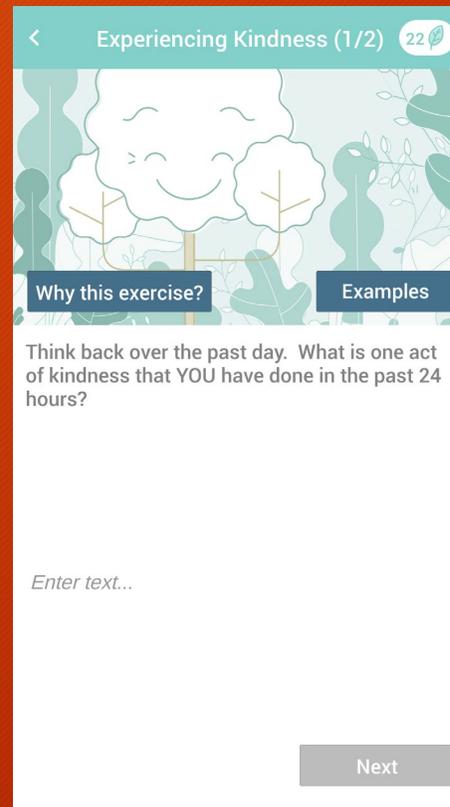
- Biochemically verified point-prevalence abstinence rate was 30%
- Self-reported 30-day abstinence
  - 6 weeks after quit day: 41%
  - 3 months after quit day: 45%
  - 6 months after quit day: 48%
- By comparison
  - 26% of daily smokers using the app “Clickotine” (n=416) reported 30-day abstinence at 2-month follow-up
  - 36% of daily smokers using an mHealth program combining real-time tailored advice with asynchronous secure messaging with a cessation counselor reported abstinence 5-month follow-up
  - An average of 28% (treatment) vs. 13% (control) of daily smokers across 4 RCTs testing text-messaging smoking cessation interventions reporting abstinence 4-6 weeks post quit

# Work in Progress

## Version 1

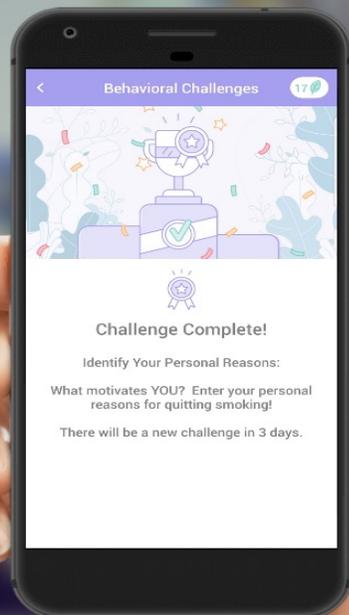


## Version 2



# Other Tools in SiS: Behavioral Challenges

Engage in "behavioral challenges" every 2-4 days, designed to coach you through your quit attempt...



...and earn badges as you go!

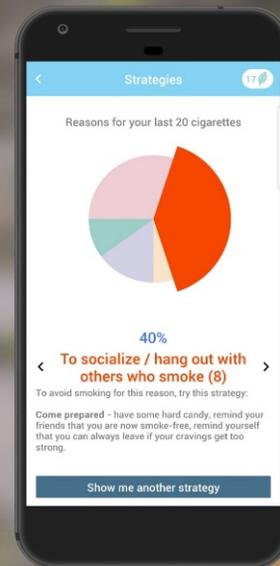


# Other Tools in SiS: Logging Cigarettes

As you go, log your cigarettes...

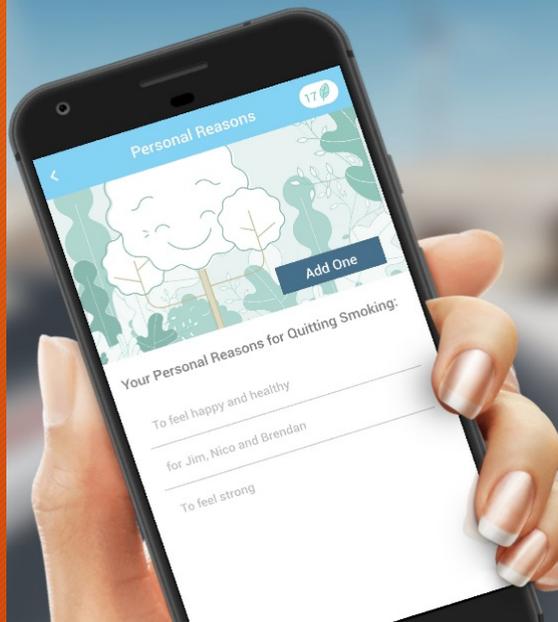


...and receive feedback based on your smoking pattern.



# Other Tools in SiS: Personal Reasons

Reflect on your  
personal reasons for  
quitting smoking...

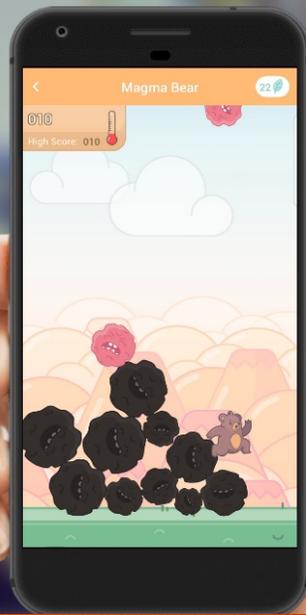


...and be reminded of  
them at key times  
during your quit  
attempt.

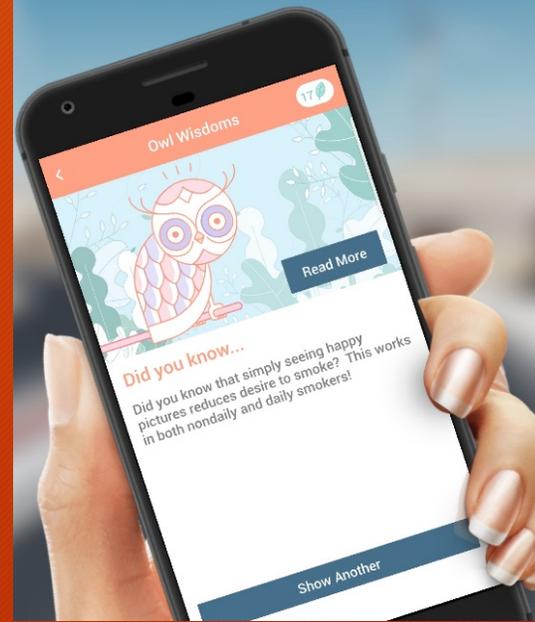


# Other Tools in SiS: Games and Facts

As you need it, play our game "Magma Bear" to beat your cravings...



...and along the way, receive science findings on why happiness matters to health and becoming smoke-free.



# Closing Thoughts

Don't think of the  
green elephant



You are where your  
attention is



Susanne  
Hoepfner



Hannah  
Carlon



Melissa  
Schick



John  
Kelly

Thank You!



My family - science is a team sport!