Stressors, Resilience Factors and Applicability of New Interventions for Substance Misuse

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Outline

- Background on stress, mood and alcohol use
- Resilience factors included related research
- Interventions including technology-based
- Formative research to develop a tobacco cessation intervention for rural populations
- Note about omitted material

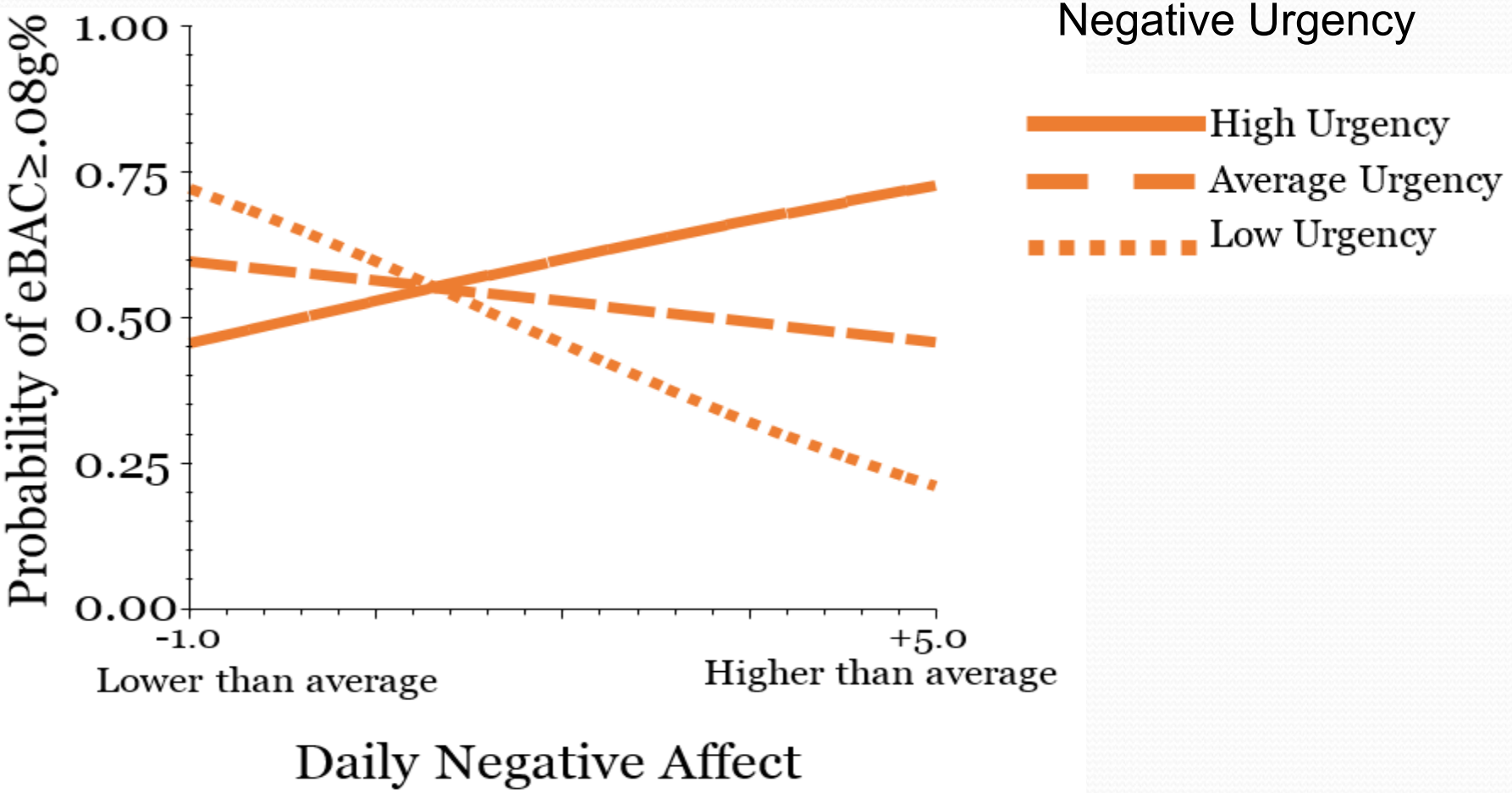
Stress, Mood and Alcohol Use

- Stress leads to negative mood (e.g., Bolger et al., 1989)
- Negative mood associated with alcohol use (e.g., Jackson & Sher, 2013)
- Alcohol use has a negative effect on stress response (e.g., Sher et al. 2007)
- Including in rural populations (Diala & Muntaner, 2003; Dixon & Chartier, 2016)

Stress, Mood and Alcohol Use

- Positive and negative affect motivate alcohol use
  - Weak or inconsistent associations at the daily level (e.g., Armeli et al., 2008; Collins et al., 1998; Hussong et al., 2001; Simons et al., 2010)
  - May be explained by individual differences in response to negative mood
  - Candidate: negative urgency-impulsive, rash response to negative mood (Whiteside & Lyman, 2001)
  - Thus, response to mood may differ by urgency (Simons et al., 2010)

Urgency Moderates Mood-Drinking Relations



O'Malley et al. (2015); Bold et al., (2017)

Resilience Factors

- Relationships between risk factors and outcomes potentially avoidable
- Resilience factors can mitigate this risk
- Examples
  - Strong family relationships (Patock-Peckham & Morgan-Lopez, 2006).
  - Religiosity (Foster et al., 2013)
  - Coping skills (Litt et al., 2003)
  - Mindfulness (Frohe et al., in submission)

Protective Behavioral Strategies

- Resilience factor that I will focus on here
- Cognitive behavioral strategies
- Aimed at reducing alcohol use & consequences

Lewis et al., 2010; Martens et al., 2004

Behavioral Strategy Sets

"Direct"

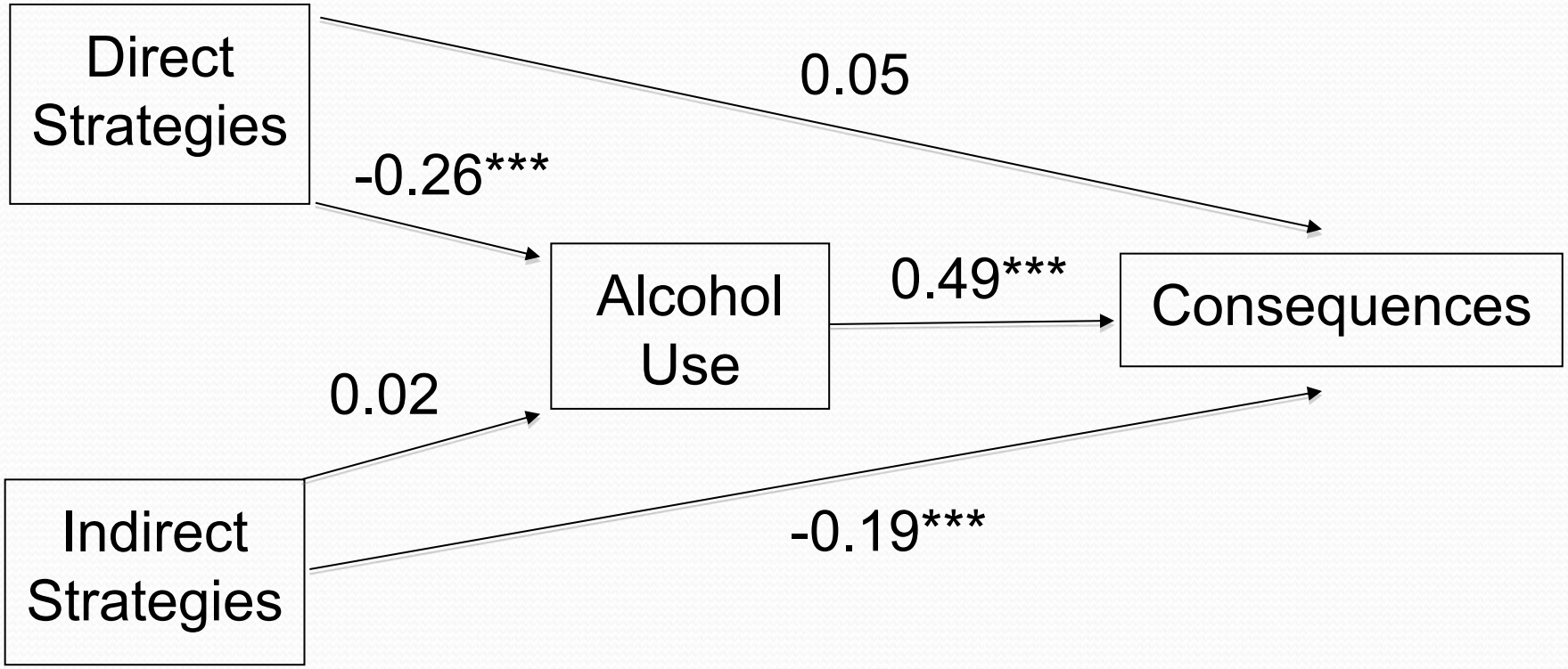
- Count drinks
- Set a drink limit
- Space drinks
- Alternate

"Indirect"

- Look out for your friends
- Carry protection
- Pre-plan transportation
- Designated driver

DeMartini, Palmer, Leeman et al., 2013

Strategy Types & Alcohol Involvement



Note. Only direct effects are illustrated. *** $p < 0.001$.

DeMartini, Palmer, Leeman et al., 2013

Differences between Strategies

- Some strategies potentially harder to implement than others
- Alcohol immediately available & rewarding
- Individual differences in tendency to favor immediate rewards
- Behavioral economics
- Thus, slowing pace of alcohol drinking (direct strategies) potentially difficult

Leeman et al., (2016); Bickel et al., (2014)

Relevant Intervention Study

- An intervention study my colleagues and I conducted is relevant to these points
- Value of protective behavioral strategies in reducing alcohol use
- Some strategies more difficult to implement than others

Leeman et al., (2016)

THRIVE

- Tertiary Health Research Intervention via Email
- MI-based, web-based alcohol screening & reduction intervention for college students
- Originally utilized in Australia & New Zealand
- Efficacy established in 3 very large clinical trials + precursors efficacious in large & small prior trials

Kypri et al., 2009; 2013; 2014

Dissemination Potential

- Very brief (9 minutes: Kypri et al., 2009)
- Computer files for intervention freely available
- Therefore adaptable across populations
- Important because of lack of utilization

Kypri et al., 2009; 2013; 2014

US-THRIVE

- Altered to fit American college students
- Slang, norms
- Also local laws, resources, etc.
- Small RCT, local college, at least monthly heavy drinking students (N = 208)

Leeman et al., 2016

US-THRIVE

- Invited all day college students at school 1-month after the beginning of semester
- Randomized eligible participants to 1 of 3 variants of US-THRIVE or educational/assessment control
- Initial, 1-month and 6-month follow-ups

Leeman et al., 2016

Personalized Feedback

Some of the questions you answered regarding your drinking come from the Alcohol Use Disorders Identification Test, a questionnaire developed by the World Health Organisation to determine whether a person's drinking might be becoming problematic. Your answers to these questions provivided the following result.

Your audit score is 22

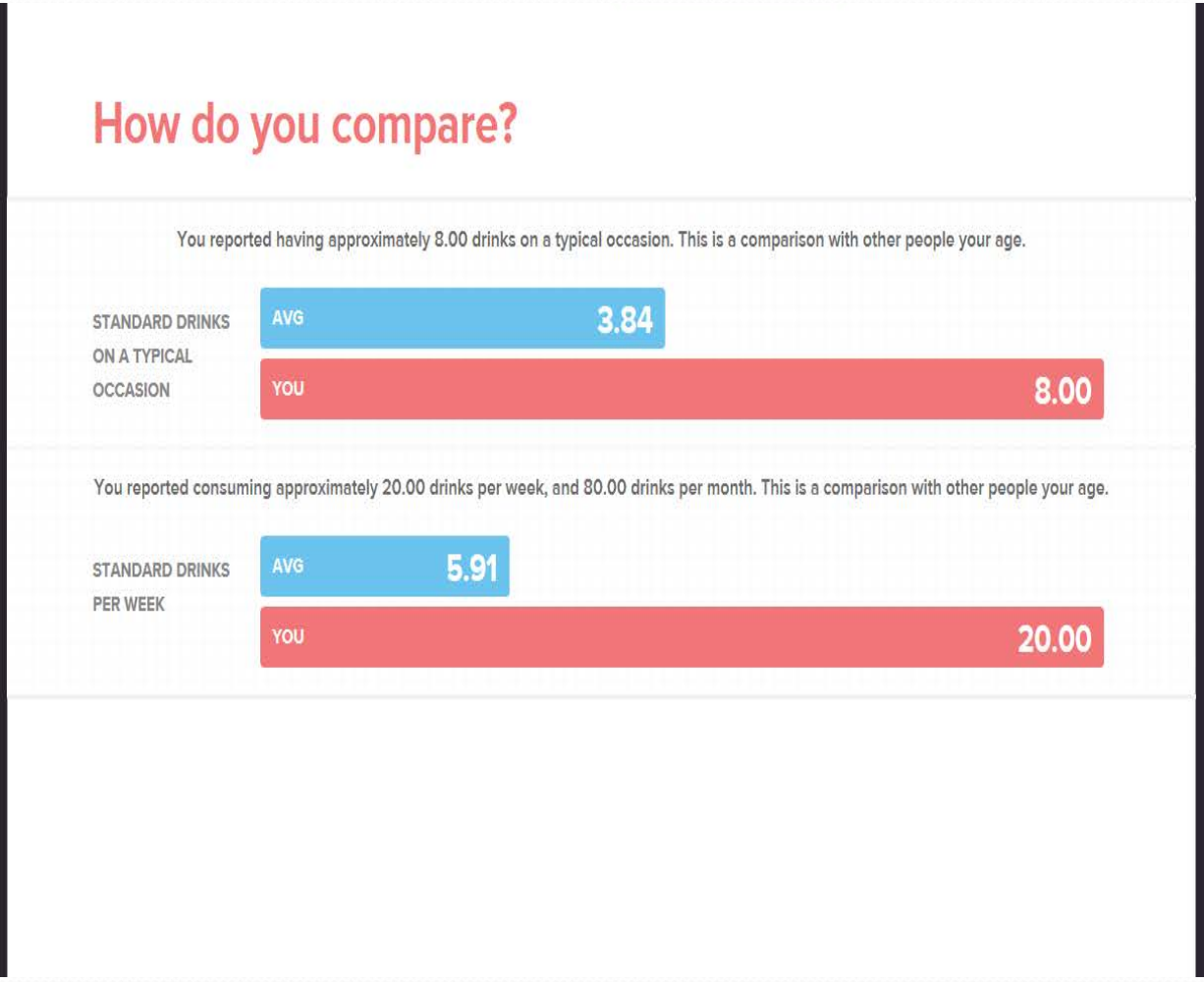
You fall into the
20-40 Alcohol Dependence Range

A person scoring in this range may be alcohol dependent and advised to have a clinical assessment of their drinking.

The main way to reduce your risk level (and AUDIT score) is to reduce the number of drinks you consume per occasion.

0-7	8-15	16-19	20-40
Moderate Drinking	Hazardous Drinking	Harmful Drinking	Alcohol Dependence

Personalized Feedback



Protective Behavioral Strategies

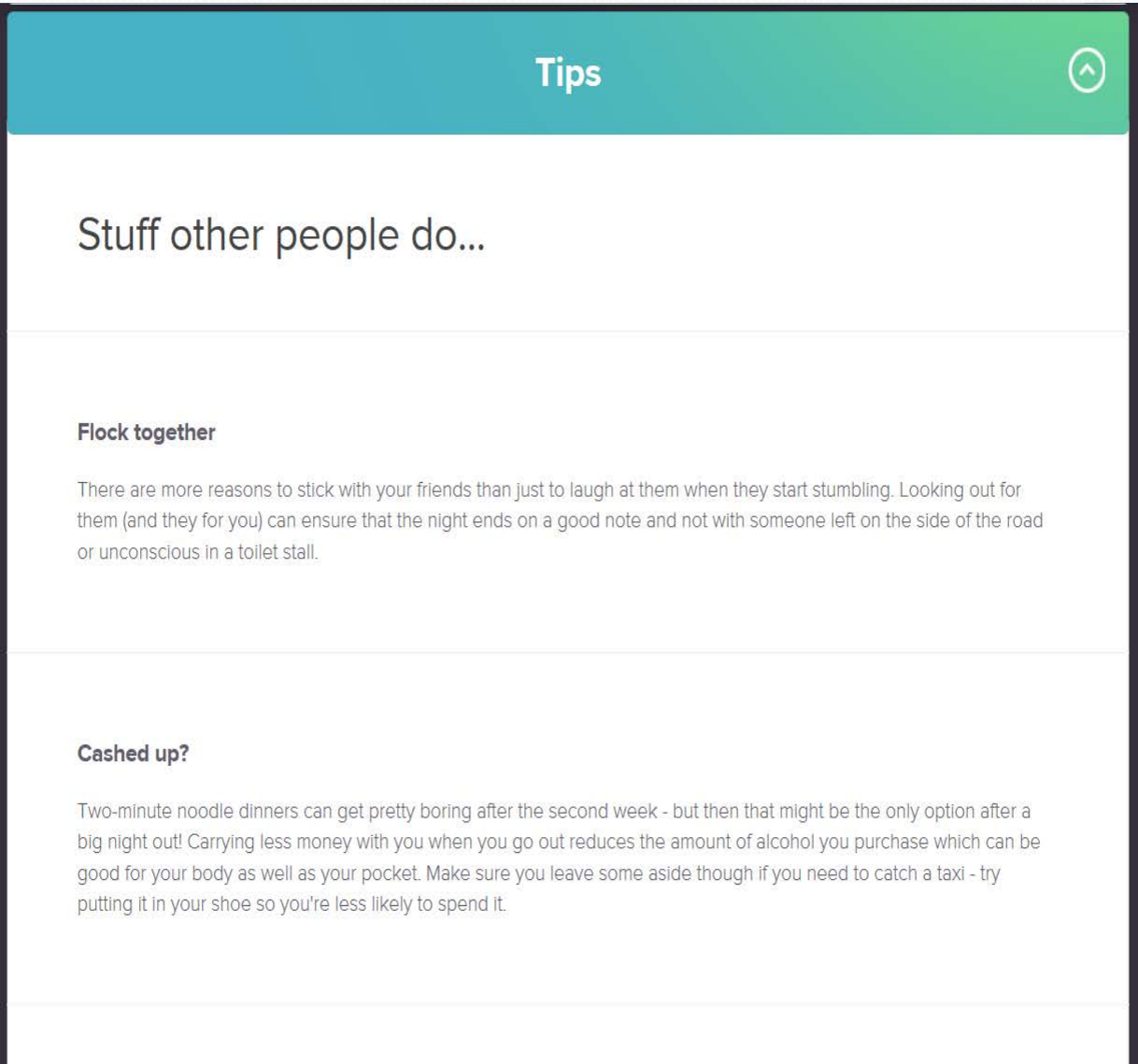
- Efficacious intervention component, but little attention paid to optimizing delivery
- Prior studies: mixed results (why?)
- Unique aspect to this study

Benton, 2004; Larimer & Cronce, 2007; Lewis et al., 2010; Martens et al., 2004

Variants

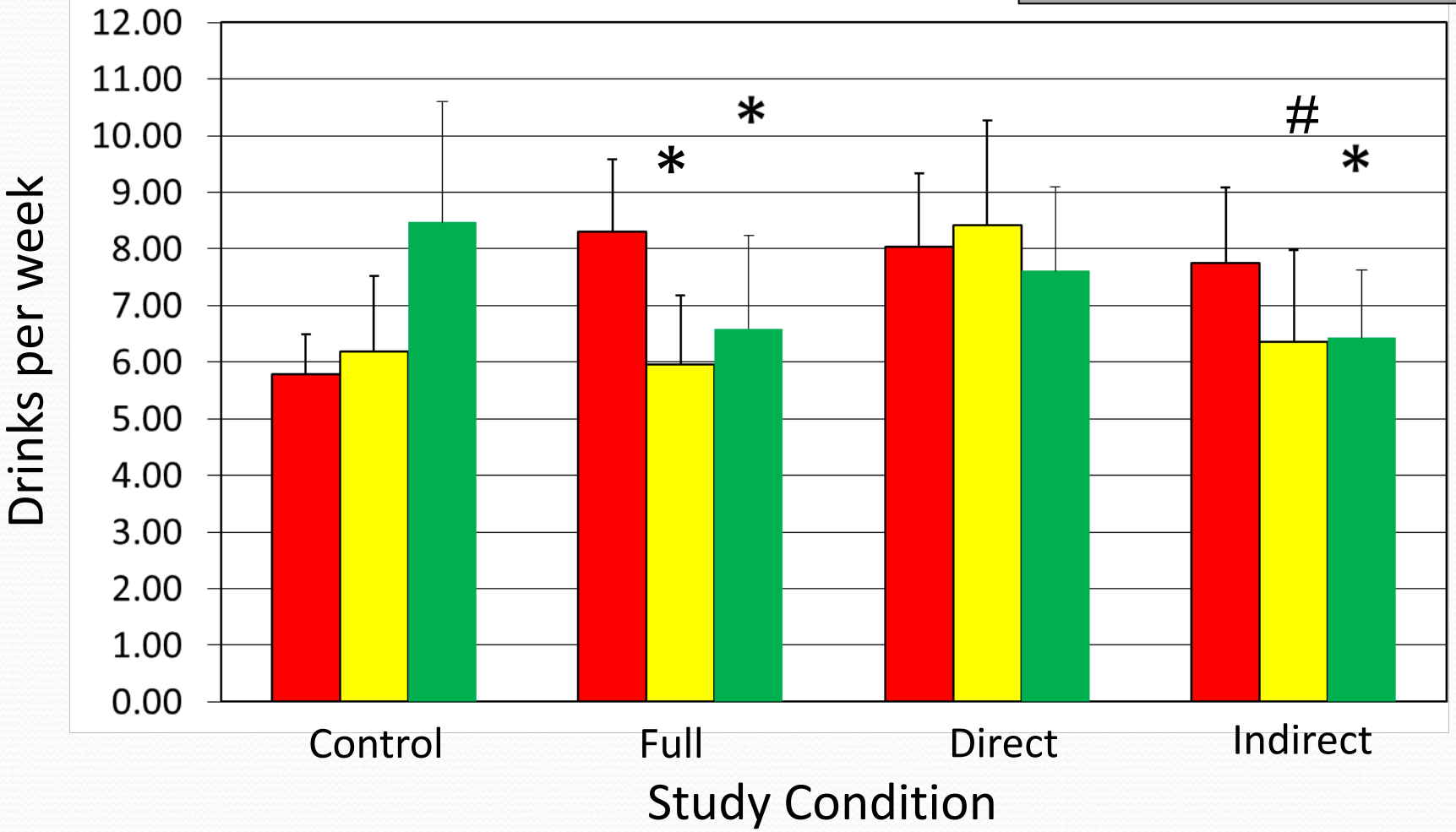
- Full list of protective behavioral strategies
- Direct strategies: pertaining to manner of drinking
- Indirect strategies: related ancillary behaviors not pertaining to manner of drinking
- Hypotheses with theoretical and empirical underpinnings (impulsivity)

PBS/Tips Screen

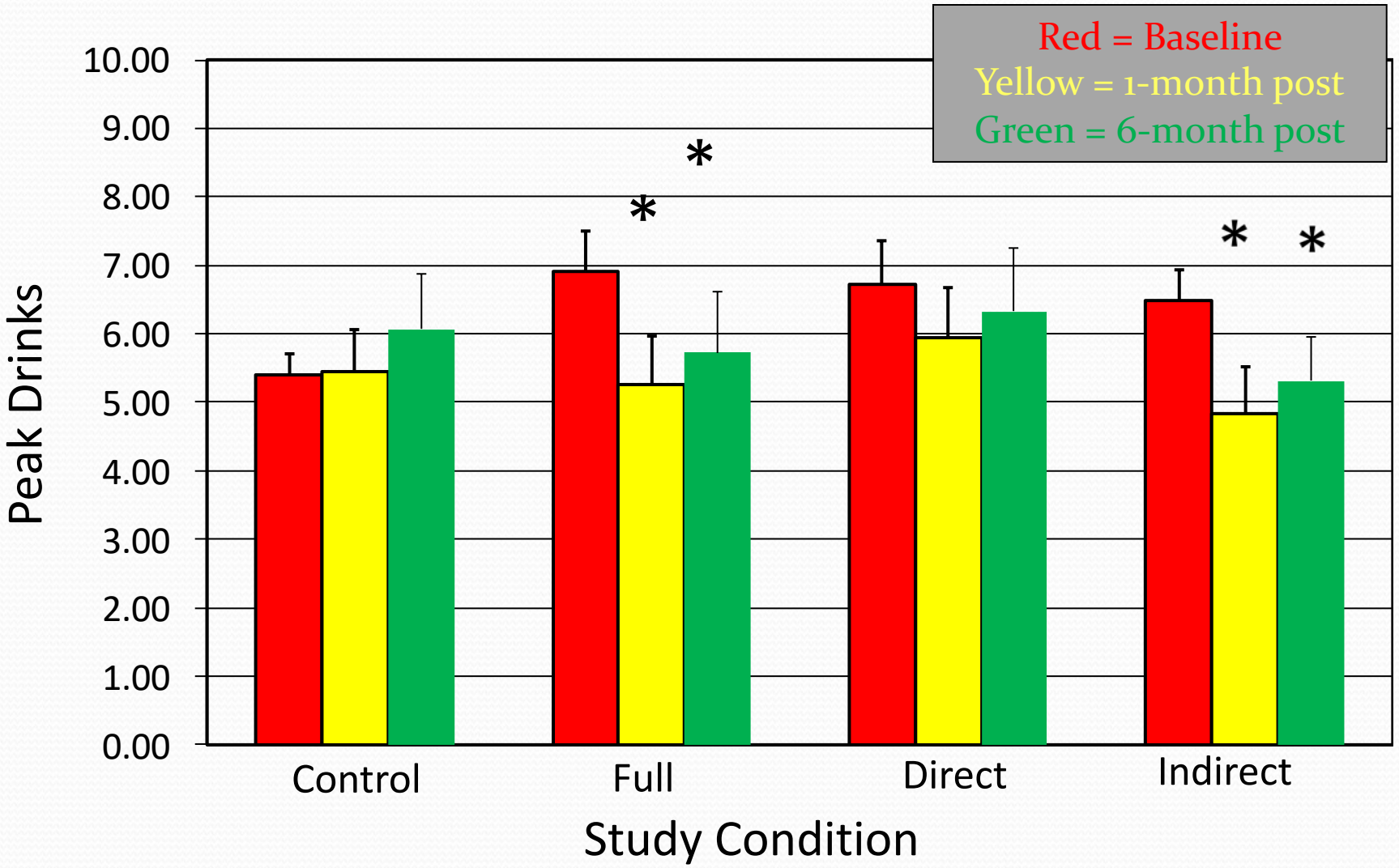


Overall Weekly Alcohol Consumption

Red = Baseline
Yellow = 1-month post
Green = 6-month post



Peak Consumption in a Day



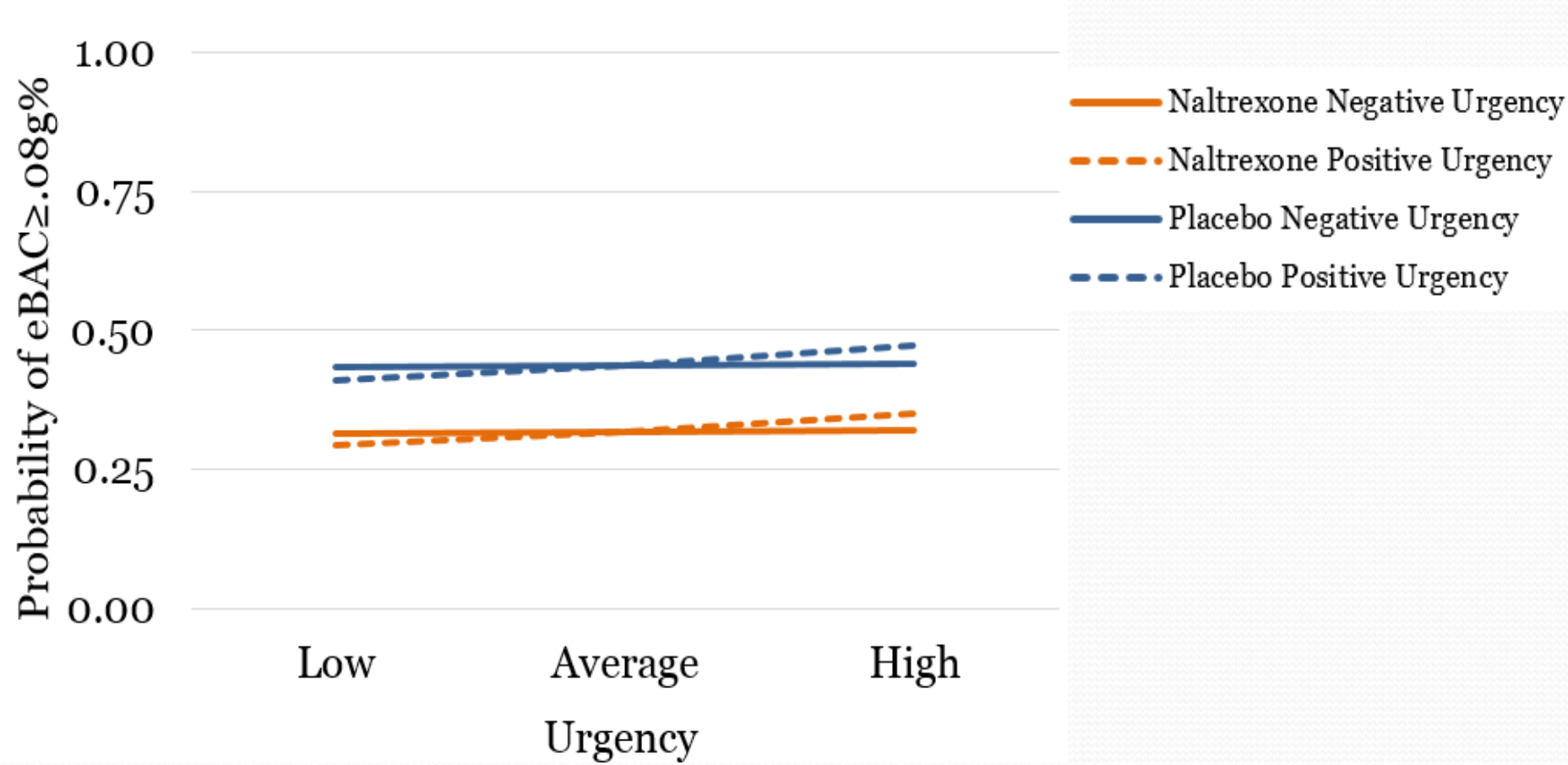
Intervention Gap

- Though valuable, inherent limitation of this type intervention
- In-the-moment intervention badly needed
- Medication
- Behavioral/technology

Background

- Naltrexone
  - Opioid antagonist
  - FDA approved for alcohol use disorder: 1994
  - Reduces drinks per day and days with estimated BAC≥.08g% (Leeman et al., 2008; Miranda et al., 2014; O'Malley et al., 2015)
  - Decreases the positive reinforcing effects of alcohol and slows rate of drinking (Davidson et al., 1996 and 1999; O'Malley et al., 2002)

Urgency x Medication



O'Malley et al. (2015); Bold et al., (2017)

Technology-Based Intervention

- Technology with us all of the time: can be used for intervention purposes
- Decided on BAC focus
  - Importance
  - Lack of knowledge
  - Difficulty teaching older adults to drink to moderate BACs
  - Availability of technology

Carey & Hustad (2002); Lansky et al. (1978); Silverstein et al. (1974); Shapiro et al. (1980); Lipscomb & Nathan (1980)

Aside: (Mis) Perception of BrAC

- Young adult heavy drinkers, aged 21-30 (*n* = 8)
- Within-subject, placebo-controlled lab admin study
- Target BrAC = 0.08%
- Actual peak = 0.084% (*SD* = 0.01, range = 0.072 – 0.094)
- Estimated peak BrAC in alc condition:
  - Mean = 0.24 (SD = 0.22, range = .05 - .60)
- Estimated peak BrAC in placebo condition:
  - Mean = 0.06 (SD = 0.05, range = 0.02 – 0.15)

Jatlow et al., 2014 ACER

Technology

Smartphone breathalyzer device & app

- BACTrack Mobile Pro (though not original choice)
  - Bluetooth
  - Fuel cell technology
  - Device small, light
  - Substantial testing: BACTrack & indep. (15 min)
  - Accompanying app: displays breath alcohol + other features (e.g., guess BrAC, time to .00%)
  - Graph tracks over time: single & multiple events
  - iOS and Android

https://www.businessinsider.com/best-breathalyzer
http://fortune.com/2014/12/23/mobile-breathalyzer-test/


9:41 AM
BAC
test

Technology

Blood alcohol estimator app

- IntelliDrink: Raphael Wichmann
  - Based on sex, weight, type of alcohol, # drinks, time
  - Accuracy/based on Widmark equation
  - Display similarity: graph-based like BACTrack
  - Also within single event & across multiple events
  - Discreet
  - iOS only
  - Access & cost were a strength, now an issue

Luczak et al. (2018)


Carrier
7:48 PM
0.038%
Current BAC
0.052 8:19 PM
Max BAC
Current Position
0.05
0.025
6:00 PM
7:00 PM
8:00 PM
9:00 PM
Drink History


Carrier
3:37 PM
STATISTICS
WEEK
MONTH
YEAR
LAST 12 MONTHS
276
DRINKS
Wine
FAVORITE DRINK
3929 g
ALCOHOL
0.119%
MAX BAC
27506 kcal
CALORIES
280.7
STANDARD DRINKS
83
SESSIONS
3.3
DRINKS PER SESSION
32d 4h
TIME INTOXICATED
8.8%
TIME INTOXICATED
ALCOHOL
483 g


Carrier
10:54 AM
DRINKS
+ NEW DRINK TEMPLATE
BEER
12 oz - 4.7 %
MIXED DRINK
10 oz - 10.0 %
SHOT
1.5 oz - 40.0 %
SPARKLING WINE
4 oz - 12.0 %
WINE
6 oz - 13.0 %

Study Design

- Non-treatment-seeking, heavy drinking young adults
- All began with brief, BAC-focused M.I. intervention
- Then randomization to 1 of 3 forms of technology for lab, alcohol self-administration session
- **Two-week field use period after lab session**
- Follow-up appointment: rating scales/interview

Study Sample

- Young adults, ages 21-25
- Past 30-day drinking
  - Report estimated BAC = 0.10% at least once
  - At least 4 heavy drinking days
  - At least 10 any drinking days
- No treatment seeking/past 12-mo treatment
- No past 12-mo moderate drinking app use
- No current SUDs besides alcohol
- No psychotropic med. use or recent prescription
- Otherwise healthy

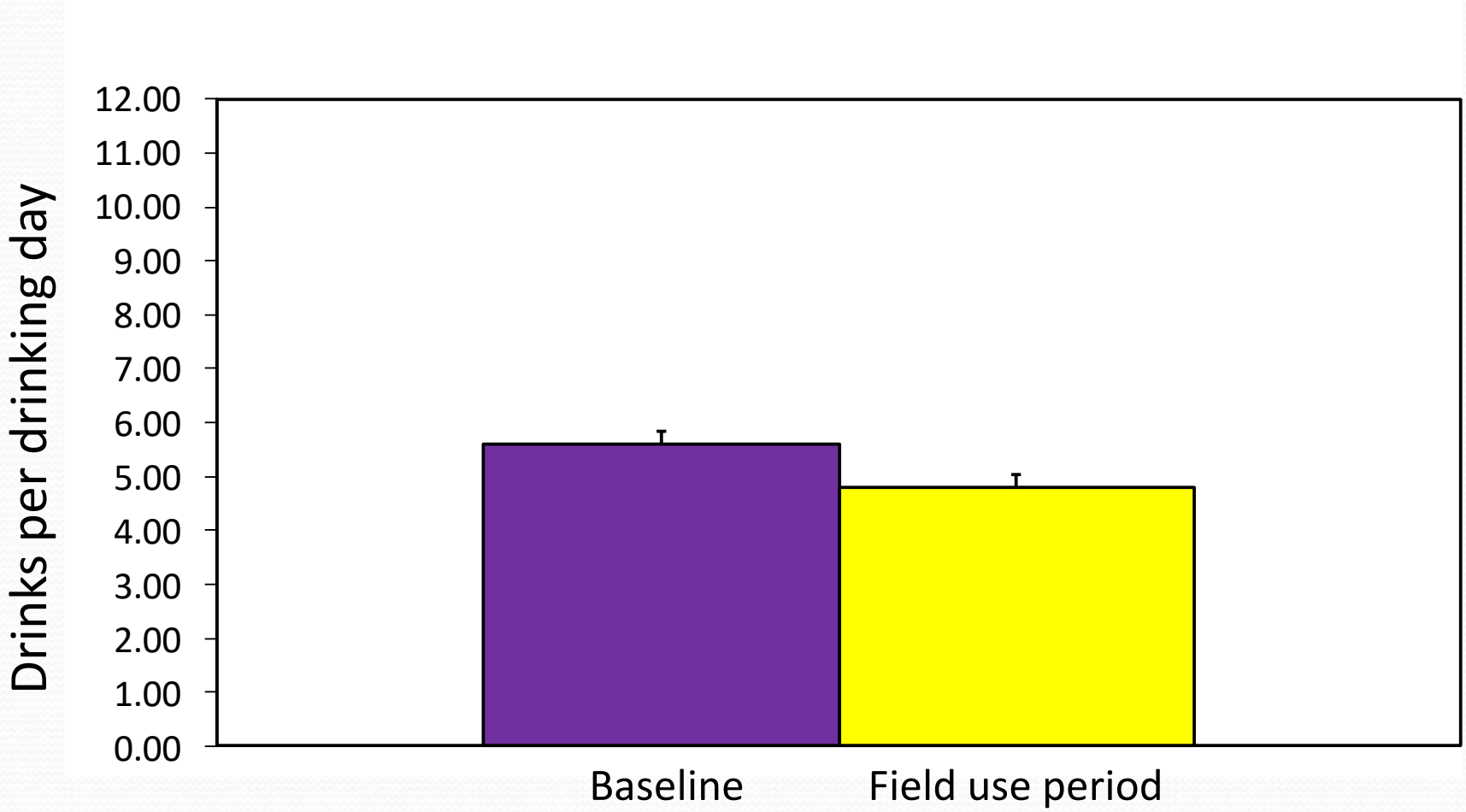
Three Forms of Technology

- Smartphone breathalyzer device & app
- BAC estimator app
- Self-texting (control)

Two-Week Field Use Period

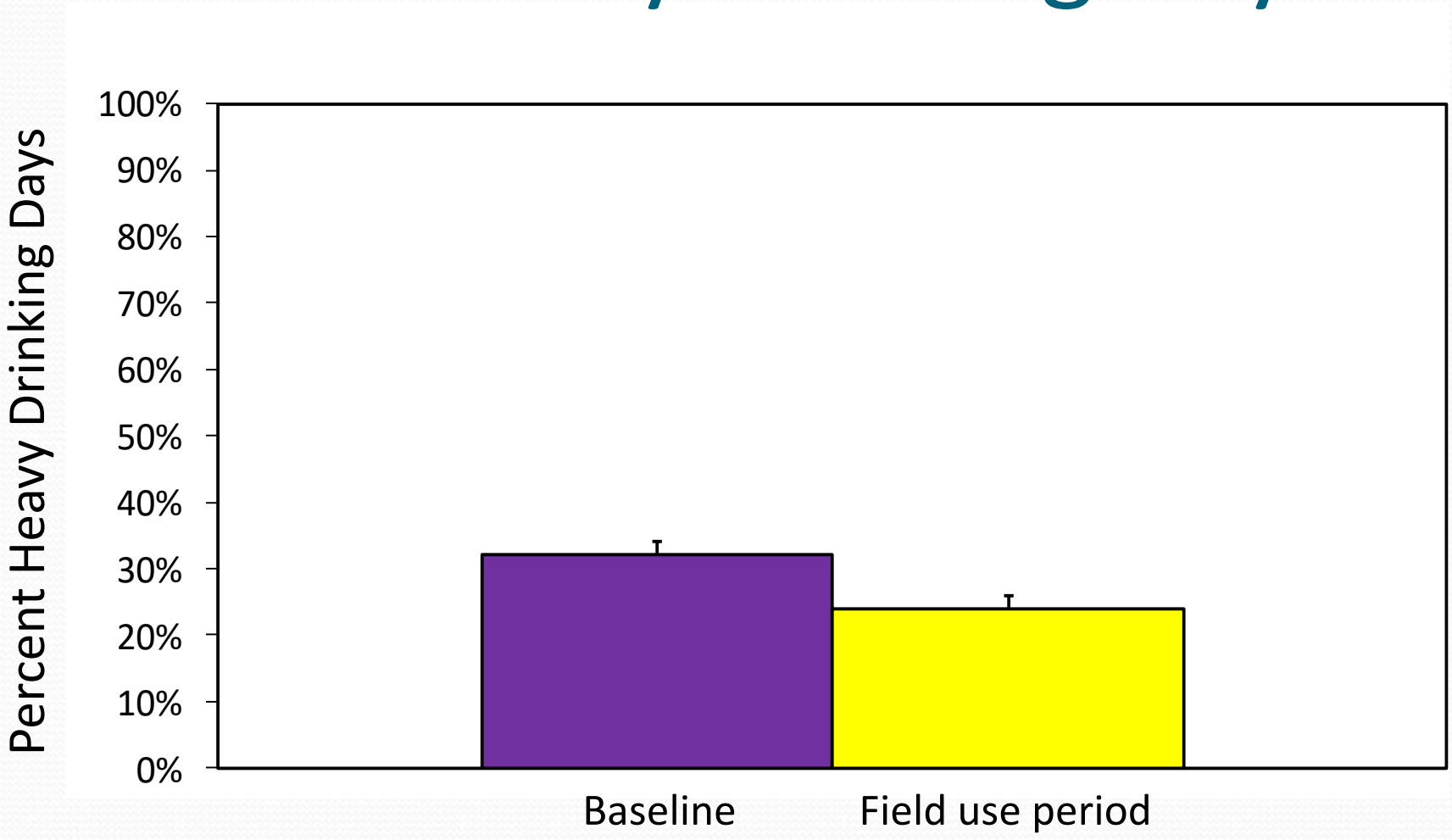
- Open access: all 3 forms of technology
- Goal: learn about use on own > effect on drinking
- Inform usability, acceptability ratings
- $20: use of each form of technology ≥ once
- No other compensation tied to technology use

Drinks Per Drinking Day



$p < .001$

Percent Heavy Drinking Days



$p < .001$

Applicability to Rural Populations

- Technology-based interventions have value but it is important to ensure that they are applicable to rural populations
- Example: Project to develop a web-based tobacco cessation intervention suited to rural populations
- Alcohol reduction/HIV preventive intervention

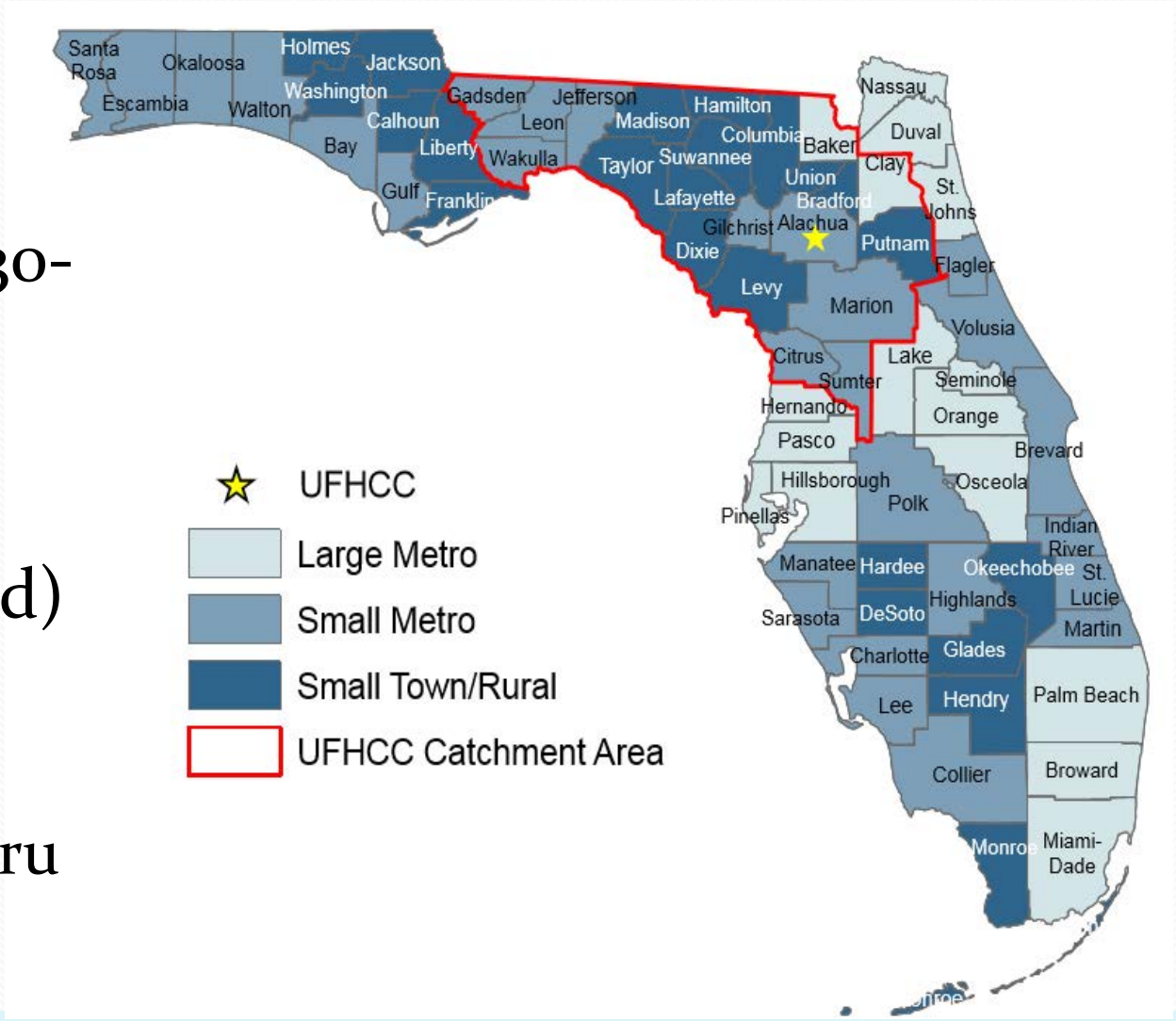
The Problem

- Rural adults 30% more likely to smoke cigarettes
- Higher mortality rates from cancer
- Researcher participation remains suboptimal
- Lack of participation may diminish validity and generalizability of studies.

CDC, 2017; Doogan et al., 2017; Schorling et al., 1997; Stoops et al. 2009; McElfish et al., 2018; Young et al., 2015

Study 1 - Formative Research

In-depth interviews with 30-40 rural tobacco users (or until saturation of themes is reached)



Damiani & Gebru

Krieger

Purpose of Study 1

- Examine psychosocial and cultural factors underlying rural tobacco users' willingness to participate in research studies.
- Theoretically grounded in health communication and behavioral science frameworks, including Social Identity Theory & the Health Belief Model.
- Primary Aim: Identify rural adults' perceived barriers and motivations to research participation
- Ultimate goal, develop web-based tobacco cessation intervention for rural individuals

Study 1 - Formative Research

Working with IFAS extension agents to establish relationship with neighboring counties

- **Levy**, Columbia, Bradford, Union

Methods

- Multi-pronged recruitment strategy to reach rural individuals

- Semi-structured interview guide to address:
    - Attitudes toward participation in research, quitting tobacco use, doctors and **citizen scientists**
    - Message delivery preferences

Study 2 - Develop & Test Intervention

- Incorporate feedback from Study 1 to develop a web-based intervention
- Develop responsive website to provide personalized feedback about research participation and tobacco use

Study 2 - Develop & Test Intervention

- 3 proposed conditions
  - BMI + Message from citizen scientist
  - BMI + Message from researcher
  - Control (Psycho-Education)

- Outcomes of interest
  - Registering in ResearchMatch
  - Intention to quit measure

Interview Themes Thus Far

- Reasons for beginning tobacco use
  - To seem cool
  - Peer and family tobacco use
  - Not understanding health risks

Interview Themes Thus Far

- Reasons for maintaining tobacco use
  - Hard to stop
  - Helps deal with stressors (needing a smoke to relax)
  - Lack of alternative stress-relieving activities (lack of community centers, lack of transportation, lack of ways to quit)
  - Lack of motivation/wanting to quit
  - Boredom

Interview Themes Thus Far

- Barriers to quitting
  - Lack of access to proper healthcare, including mental health
  - Lack of consistent doctor-patient relationships (doctors change frequently)
  - Lack of time with doctor
  - Frustration at being told to quit whenever they talk to a doctor (often a condescending tone) without consideration of their circumstances
  - Feeling trapped/addicted

Interview Themes Thus Far

- Thoughts about use of technology & research
  - Mostly open to it
  - General access to internet
  - Some literacy concerns: language and computer/internet literacy
  - Openness to engaging with UF and researchers to talk about health and tobacco use, in particular with students and citizen scientists to bridge the gap
  - Altruism

Interview Themes Thus Far

- Personal preferences with message delivery
  - Use of clear and large fonts
  - Possible addition of videos
  - Not too many ads
  - Not asking too much personal info upfront (distrust of “the man” and technology)
  - Downloadable features to be accessed offline
  - Allowing for customization of experience

Conclusions

- Stress leads to negative mood: impact on alcohol use
- Can be mitigated by resilience factors (e.g., PBS)
- Potentially enhanced further by interventions
- Important to get input from rural individuals and tailor interventions accordingly

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