

# Does perceived risk of harm mediate the effects of a primary care alcohol screening and brief advice intervention for adolescents?

*Amy Flynn, MS, Himani Byregowda, MPH, John Rogers Knight, MD, Sion K. Harris, PhD*



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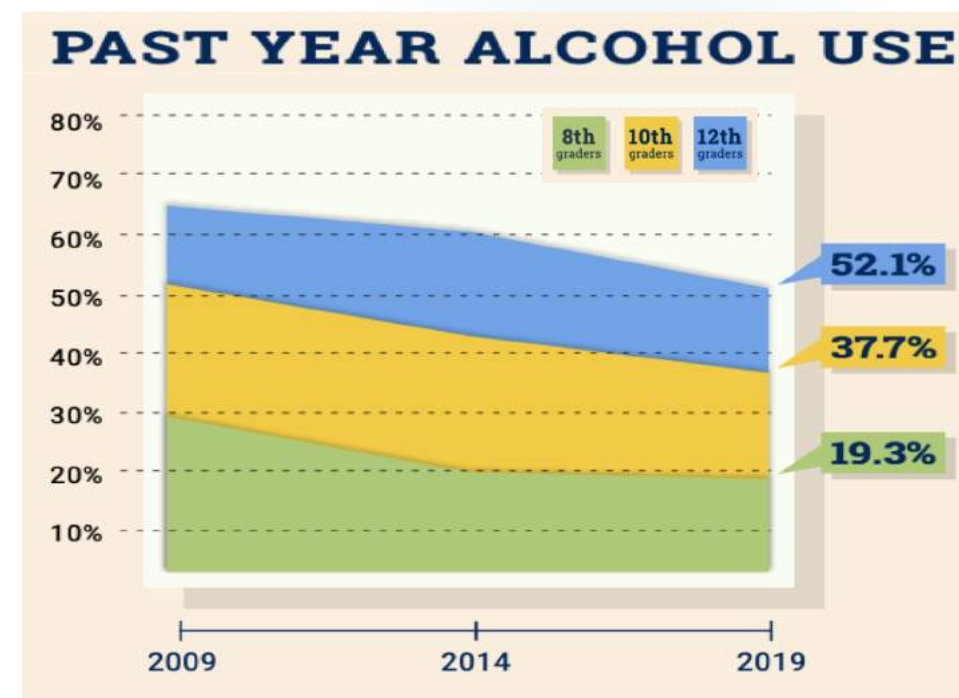
# Disclosures

## **Conflict of interest statement:**

- I have no commercial relationships to disclose
- I will not be discussing any unapproved uses of pharmaceuticals or devices
- My views do not necessarily reflect those of any of these bodies, or my academic institution

# Background

- In the United States each year, alcohol contributes to over **93,000** deaths, and the loss of **2.7 million** years of potential life<sup>1</sup>
- In 2019, 19% of 8<sup>th</sup> graders, 38% of 10<sup>th</sup> graders, and 52% of 12<sup>th</sup> graders reported alcohol use<sup>2</sup>
- More than **90%** of alcohol consumed by young people is through binge drinking<sup>3</sup>



# Background

- Computer-facilitated screening and provider brief advice (cSBA) was associated with significant reduction in youth alcohol use rates during follow-up\*
- Hypothesized mediator of cSBA effect was increased perceived risk of harm (PRoH) from alcohol use

\* Harris SK, et al., Computer-facilitated substance use screening and brief advice for teens in primary care: an international trial. *Pediatrics*. 2012 Jun;129(6):1072-82.

# Study Objective

To test whether perceived risk of harm was a mediator of the effect of cSBA on adolescent alcohol use

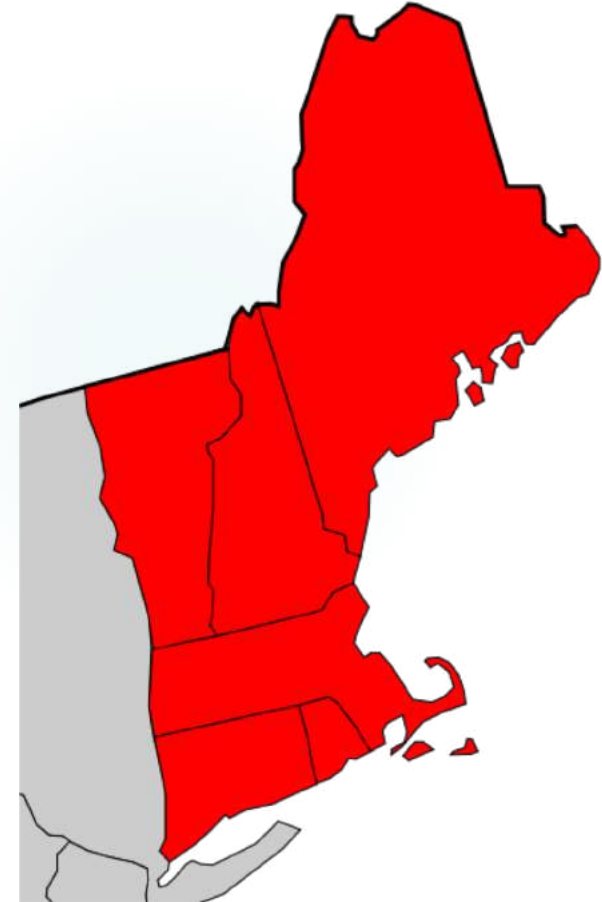
## Hypotheses:

- PRoH is more likely to stay high or increase from baseline to follow-up among patients receiving cSBA as compared to patients receiving usual care
- Increased PRoH would in turn be associated with a lower likelihood of using alcohol
- Degree to which PRoH mediates the intervention effect will differ based on baseline alcohol use history



# Study Design

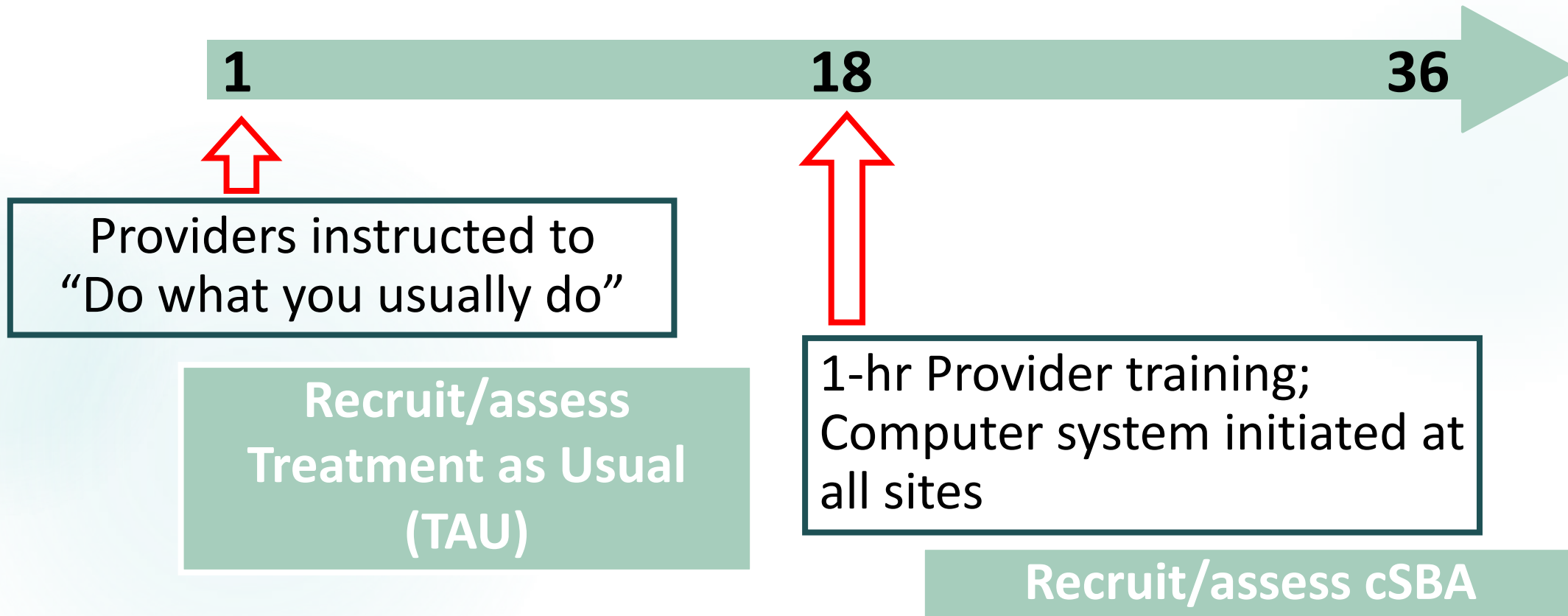
- 9 primary care sites in 3 New England states
- **Inclusion criteria:** 12- to 18-year-olds arriving for routine primary care (2005-2008)
- **Exclusion criteria:**
  - Emotionally or medically inappropriate for recruitment or had disability that would inhibit participation
  - Unavailable for follow-up



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# Study Design

## Pretest-Posttest Comparative Effectiveness Trial (2005-2009)





Computer-facilitated system included:

- CRAFFT screen\* and display of patient's score and risk level
- 10 pages of scientific information and true-life stories showing harmful effects of substance use and related riding/driving risk
- Provider Report sheet with CRAFFT results and 'talking points' to prompt 2-3 minute discussion with teen; given to provider before visit

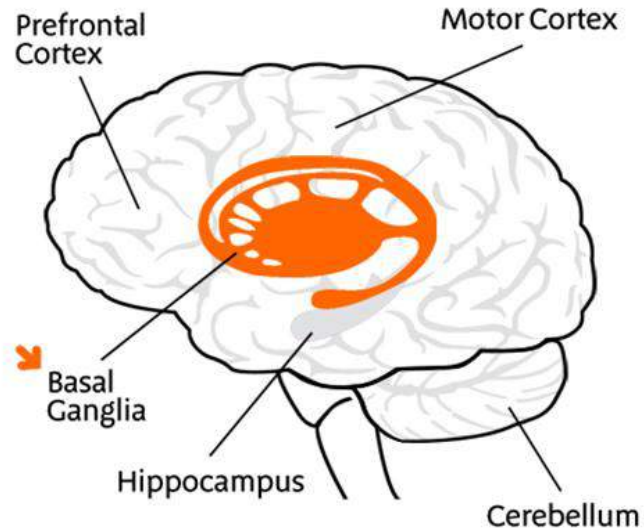
\* Knight JR, Sherritt L, Shrier LA, Harris SK, Chang G. Validity of the CRAFFT substance abuse screening test among general adolescent clinic patients. Arch Pediatr Adolesc Med, 2002(Jun);156(6):607-614.

## Drugs and alcohol affect your brain and can damage it for life.

Drugs and alcohol can affect memory, coordination, decision making, learning, and cause depression.

Roll over the text below and see what happens to the picture.

Area of Brain	Drug Effect
<span style="color: green;">■</span> <a href="#">Prefrontal Cortex</a>	Leads to trouble making wise decisions.
<span style="color: orange;">■</span> <a href="#">Basal Ganglia</a>	Impairs coordination, slows reflexes.
<span style="color: purple;">■</span> <a href="#">Hippocampus</a>	Causes short-term memory loss.
<span style="color: red;">■</span> <a href="#">Cerebellum</a>	Affects balance and coordination.
<span style="color: blue;">■</span> <a href="#">Motor Cortex</a>	Increases risk of stroke among young alcohol drinkers and drug users.



**NEXT >>**

<sup>1</sup>Eldreth DA, Matochik JA, Cadet JL, Bolla KI. Abnormal brain activity in prefrontal brain regions in abstinent marijuana users. *Neuroimage*. Nov 2004;23(3):914-920.

<sup>2</sup>Moselhy HF, Georgiou G, Kahn A. Frontal lobe changes in alcoholism: a review of the literature. *Alcohol Alcohol*. Sep-Oct 2001;36(5):357-368.

<sup>3</sup>Daumann J, Fischermann T, et al. Memory-related hippocampal dysfunction in poly-drug ecstasy (3,4-methylenedioxyamphetamine) users. *Psychopharmacology (Berl)*. Aug 2005;180(4):607-611.

<sup>4</sup>National Institute on Drug Abuse. Research Report Series.

## Alcohol can hurt your liver.

Drinking can scar your liver, and this can begin during the teen years.

- More than 2 million Americans suffer from alcohol-related liver disease.
- Some drinkers develop alcoholic hepatitis, or inflammation of the liver.
  - This can result in fever, jaundice (abnormal yellowing of the skin, eyeballs, and urine), abdominal pain, death.
- About 10 to 20 percent of heavy drinkers develop alcoholic cirrhosis, or scarring of the liver.
  - This can cause death, even if drinking stops.

[See alcohol-damaged liver](#)

[NEXT »](#)



Cirrhosis

<sup>1</sup>Wann RE, Smart RG, Govoni R. The epidemiology of alcoholic liver disease. *Alcohol Res Health*. 2003;27(3):209-219.

# Data Collection

- Baseline, **3-month** and 12-month follow-ups
- Strongest intervention effect at 3-months
- Demographics, substance use, PRoH, other risk factors (use by peers, family members)
- Past 90-day alcohol use days and number of drinks per day was assessed through a Modified Timeline Follow-Back (TLFB) interview at each timepoint



# Data Collection

- PРоH questions from Monitoring the Future survey:  
“How much do you think people risk harming themselves (physically or in other ways) if they...”
  1. Try **1 or 2 drinks** of an alcoholic beverage (beer, wine, or liquor)?
  2. Have 5 or more drinks **once or twice each weekend?**

**Responses:** no risk, slight risk, moderate risk, great risk

# Data Analysis

- Participants with complete 3-month TLFB assessments were included
- Stratified by baseline past-12-month alcohol use
  - 1449 with **no use** at baseline
  - 647 with **prior use** at baseline
- Multiple logistic regression models analyzed two dichotomous outcome measures: past 3-month use/no use and binge/no binge drinking
- Simple mediation analyses using PROCESS macro (Hayes, 2019) in SAS version 3.4
- Models controlled for differences in baseline characteristics between groups



# Mediator Variables

- Two PРоH variables (“Trying any alcohol” and “Binge drinking every weekend”):
  - Response options at each timepoint dichotomized into:
    - “**High**” PРоH (“Moderate” or “Great” risk)
    - “**Low**” PРоH (“No” or “Low” risk)
  - Trajectory categories created: (4) Stayed high, (3) Increased from low to high, (2) Decreased from high to low, (1) Stayed low
  - “Stayed low” and “decreased” analyzed as one category

# Baseline Characteristics

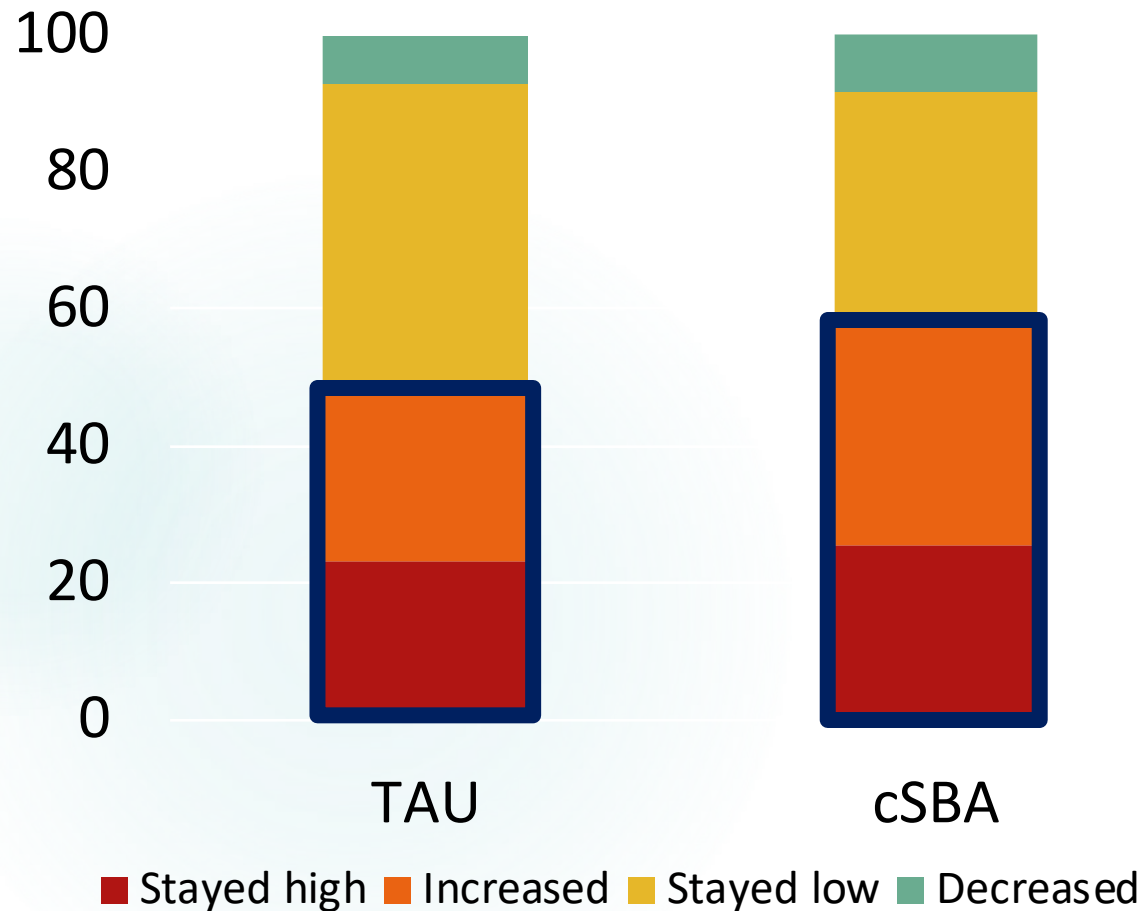
	No Use n (%)	Prior Use n (%)
Age (mean $\pm$ SD)	14.75 (1.9)	16.79 (1.3)
Male	666 (46.0)	210 (32.5)
Race/Ethnicity		
White non-Hispanic	915 (63.2)	438 (67.7)
Black non-Hispanic	169 (11.7)	169 (7.4)
Asian non-Hispanic	104 (7.1)	47 (7.3)
Hispanic	159 (11.0)	71 (11.0)
Other non-Hispanic	102 (7.0)	43 (6.6)

# Baseline Characteristics

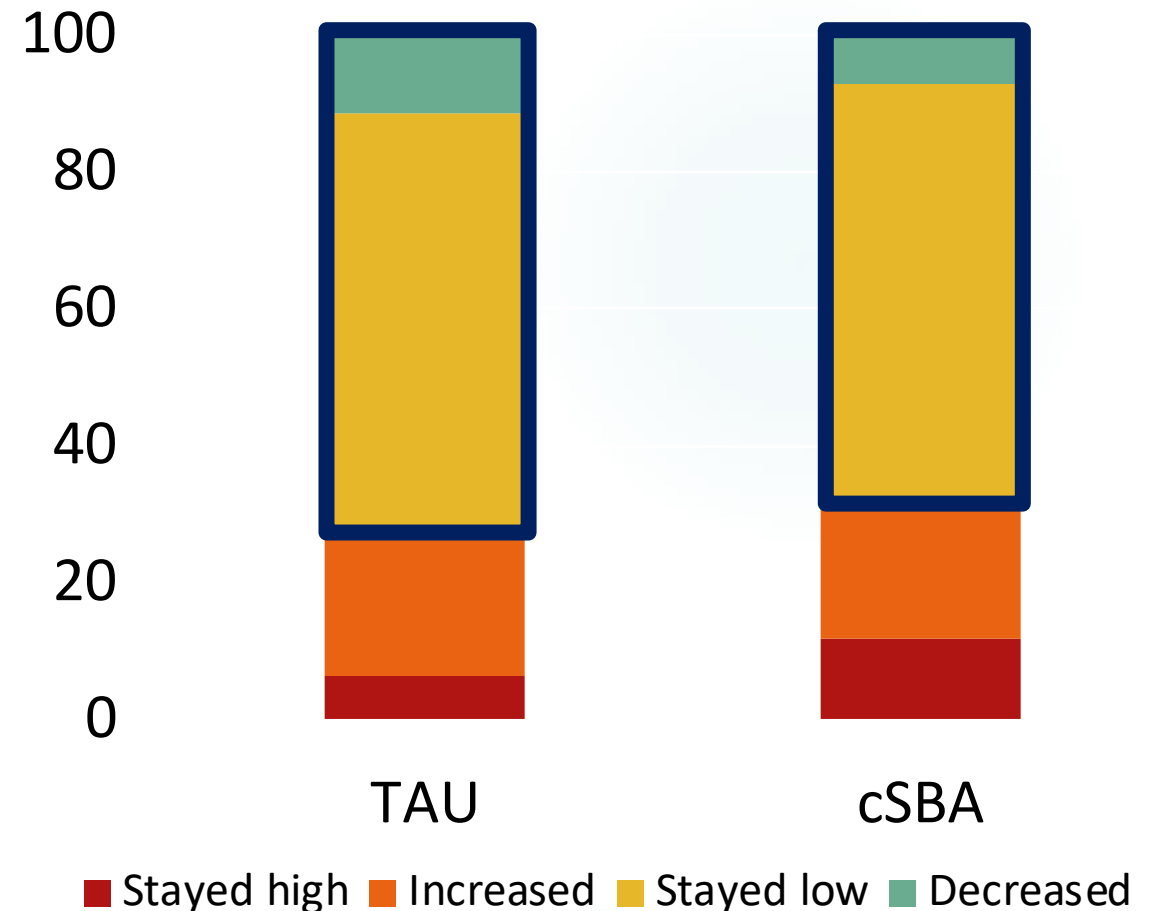
	No Use n (%)	Prior Use n (%)
Parents with college degree or higher	589 (40.9)	287 (44.9)
Two parents at home	1017 (70.8)	407 (64.2)
Parent substance use	174 (12.0)	148 (22.9)
Sibling substance use	146 (10.1)	246 (38.1)
Peer substance use	690 (47.7)	575 (89.2)

# Perceived Risk of Harm (TRYING, 3 months)

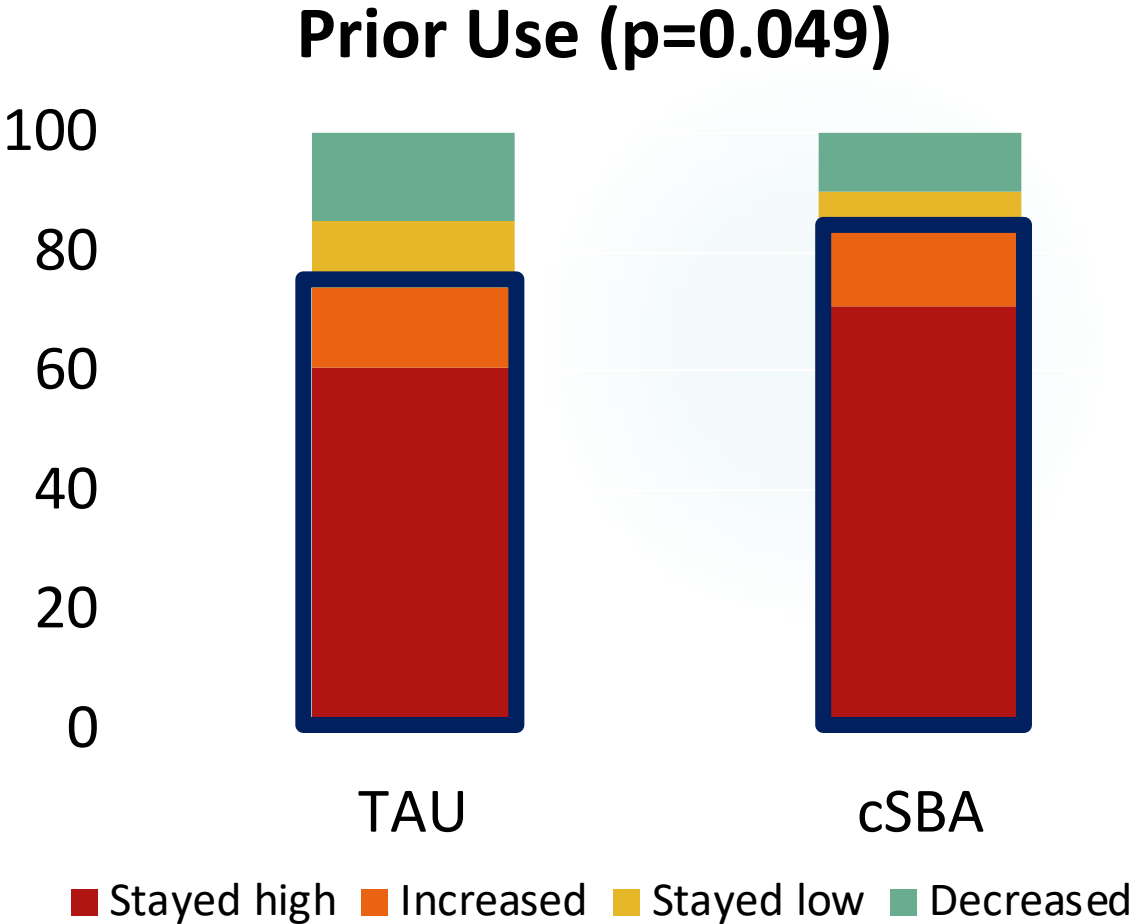
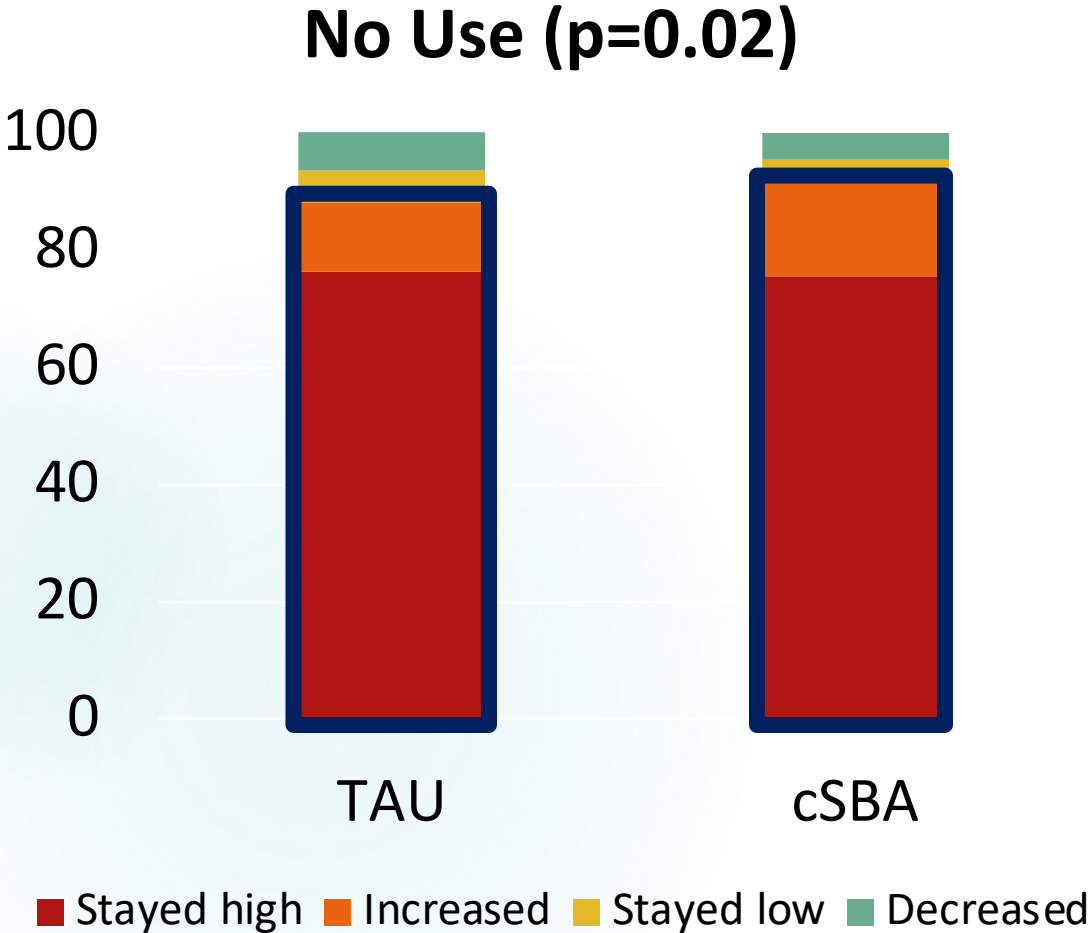
## No Use (p=0.007)



## Prior Use (p=0.12)

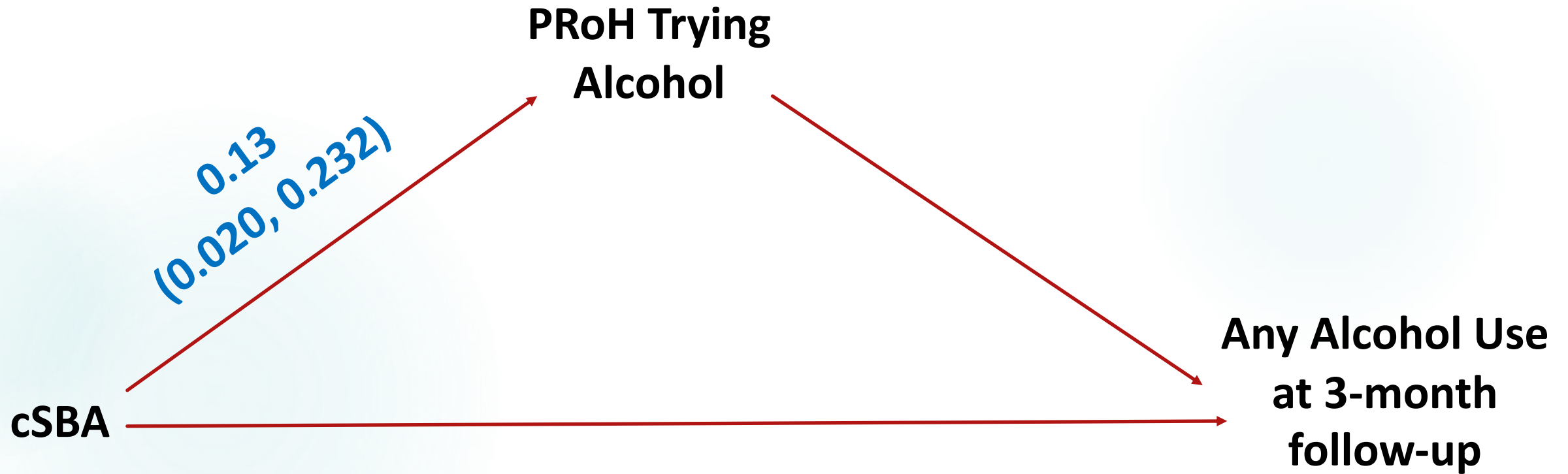


# Perceived Risk of Harm (WEEKLY BINGE, 3 months)



# Mediation Results: No Use- Perceived Risk of Trying Alcohol

## 3-months Any Alcohol Use

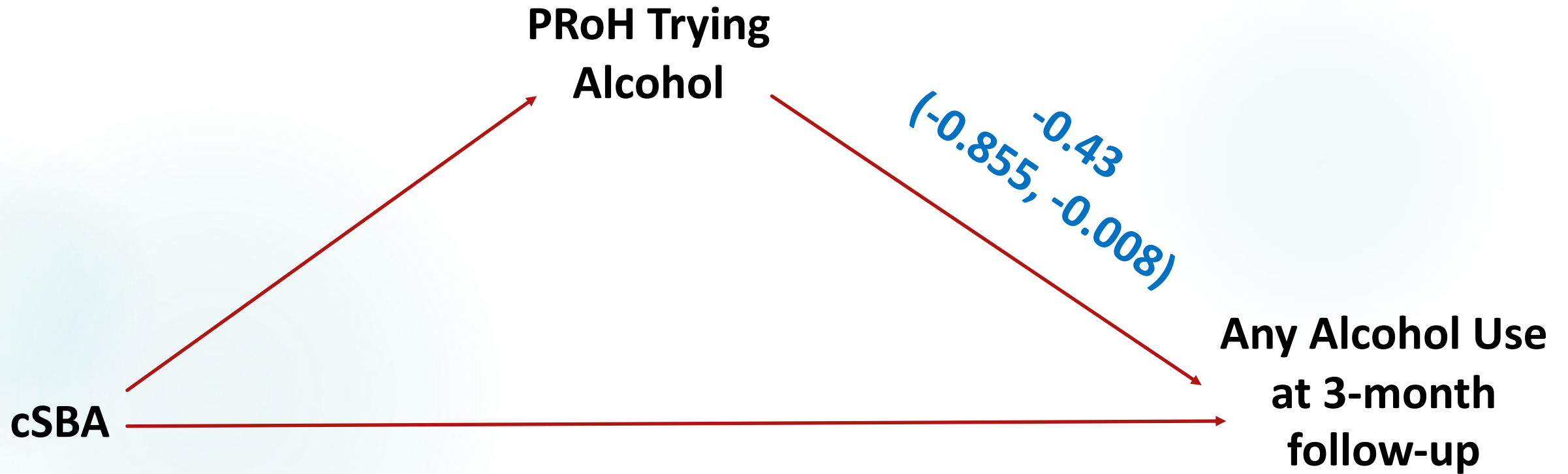


■ Direct effect



# Mediation Results: No Use- Perceived Risk of Trying Alcohol

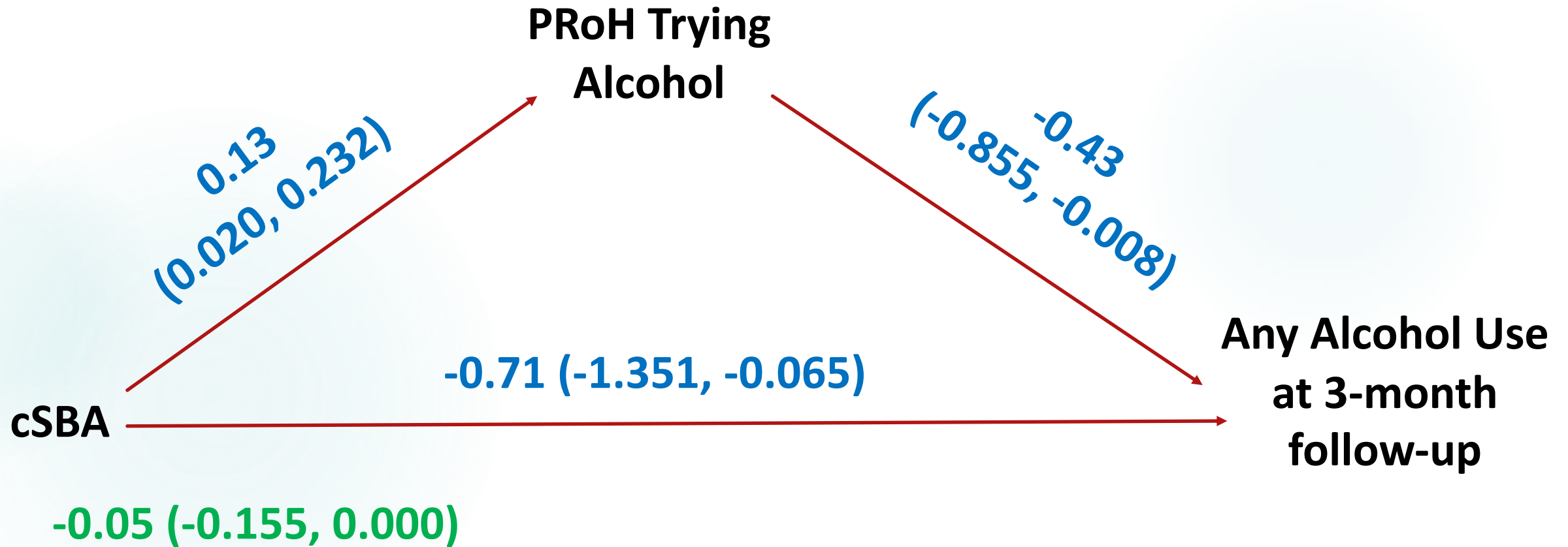
## 3-months Any Alcohol Use



■ Direct effect

# Mediation Results: No Use- Perceived Risk of Trying Alcohol

## 3-months Any Alcohol Use

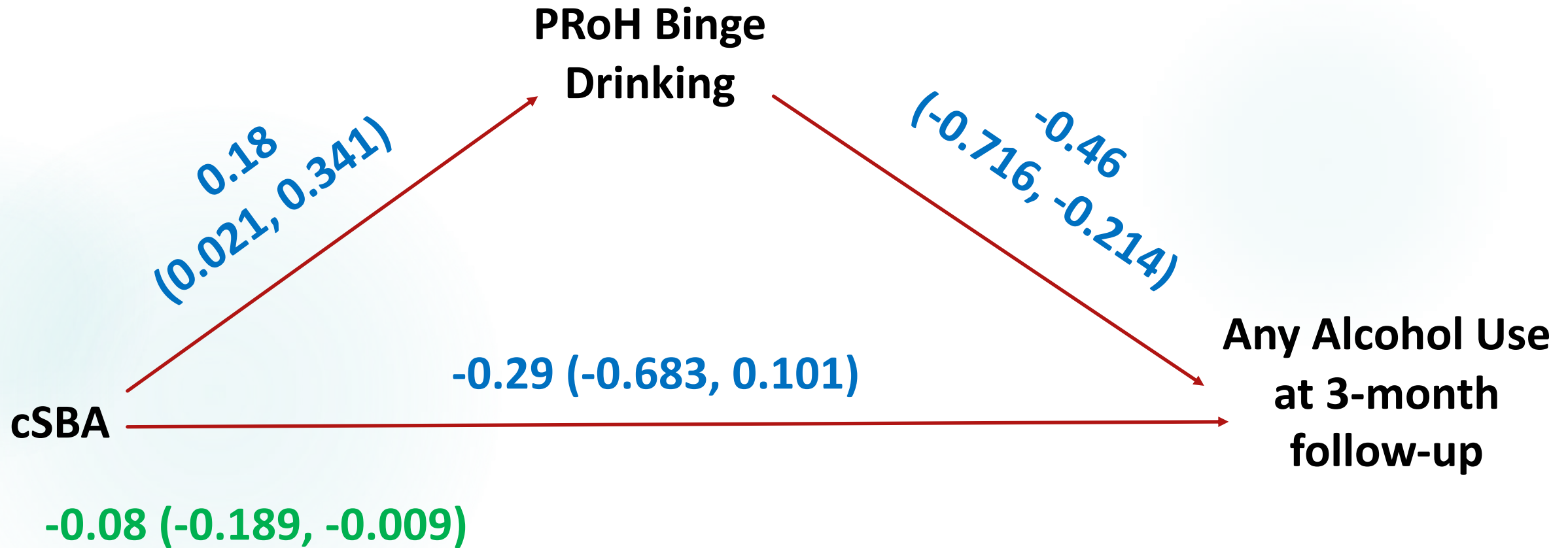


■ Direct effect ■ Indirect effect

Among adolescents with **no use at baseline**,  
perceived risk of harm from trying alcohol **did  
not mediate** the cSBA effect on past 90-day  
any alcohol use at the 3-month follow-up

# Mediation Results: Prior Use- Perceived Risk of Binge Drinking

## 3-months Any Alcohol Use



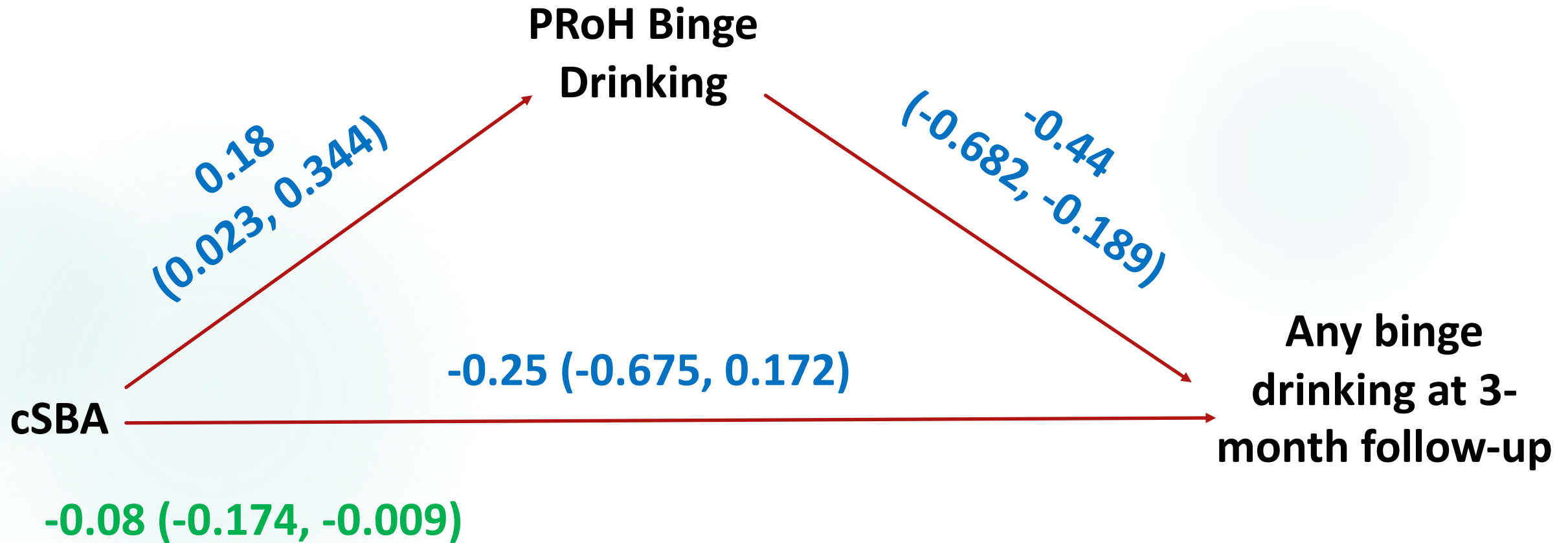
■ Direct effect ■ Indirect effect

Among adolescents with *prior use at baseline*, perceived risk of harm from **BINGE** drinking fully mediated the effect of the cSBA on past 90-day **any alcohol use** at 3-month follow-up



# Mediation Results: Prior Use- Perceived Risk of Binge Drinking

## 3-months binge drinking



■ Direct effect ■ Indirect effect



Among adolescents with *prior use at baseline*, perceived risk of harm of **BINGE** drinking mediated the effect of the cSBA on past 90-day **heavy episodic drinking** at 3-month follow-up

# Summary of Findings

- cSBA →→ INCREASED perceived risk of harm
- Higher perceived risk →→ DECREASED likelihood of alcohol use
- PРоH did not mediate cSBA effect on alcohol use *among adolescents with no prior drinking at baseline*
- PРоH fully mediated cSBA effect on any alcohol use and binge drinking *among adolescents with prior drinking*

# Study Limitations

- All study sites were in New England; generalizability of findings is unknown
- Quasi-experimental rather than randomized trial
- Self-reported data
- PROCESS macro did not allow specification of cluster-sampling design

# Conclusions and Future Research

- Computer-facilitated screening and brief advice intervention can influence adolescents' PРоH from alcohol use, contributing to lower alcohol use rates
- Future studies should be randomized trials, with larger sample sizes
- Need to develop and test strategies that extend effects over longer periods

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**Thank you!**