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

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Disclosures

Conflict of interest statement:

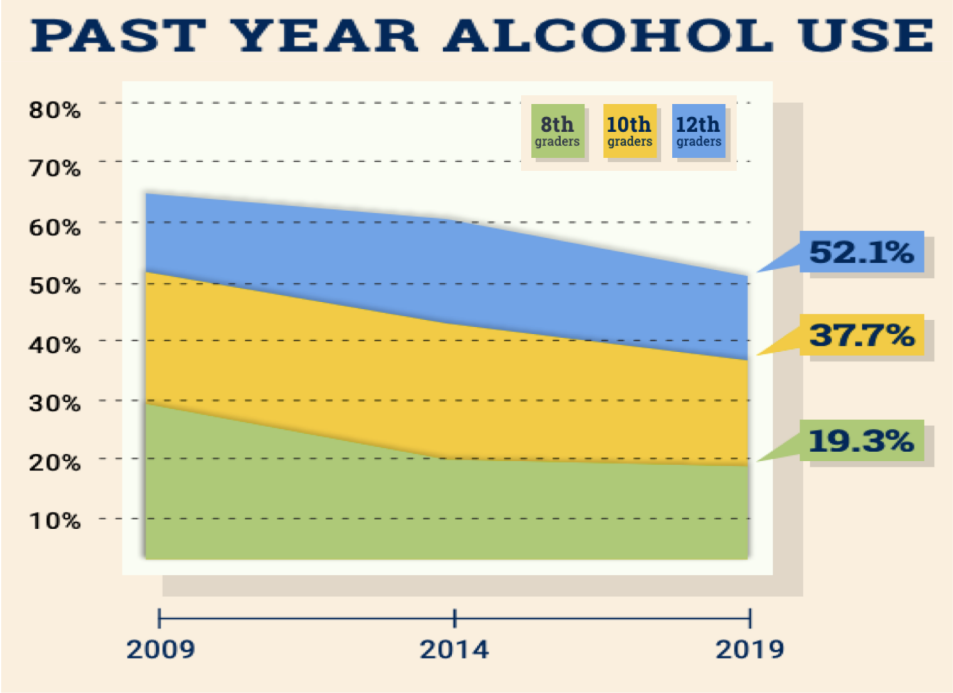
- I have no commercial relationships to disclose
- I will not be discussing any unapproved uses of pharmaceuticals or devices
- My views do not necessarily reflect those of any of these bodies, or my academic institution

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[1]

- In 2019, 19% of 8th graders, 38% of 10th graders, and 52% of 12th graders reported alcohol use[2]

- More than **90%** of alcohol consumed by young people is through binge drinking[3]



Source: [1] Centers for Disease Control and Prevention (CDC). *Morbidity and Mortality Weekly Report, July 31,* 2020. Vol. 69/no. 30. Available at: https://stacks.cdc.gov/view/cdc/91222. [2]National Institute on Drug Abuse. Monitoring the Future Survey Results., 2020. Available at: https://www.drugabuse.gov/drug-topics/trends-statistics/infographics/monitoring-future-2019-survey-results-overall-findings. [3]Centers for Disease Control and Prevention (CDC). *Fact Sheets: Underage Drinking,* 2016. Available at: http://www.cdc.gov/alcohol/fact-sheets/underage-drinking.htm.

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.

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Study Objective

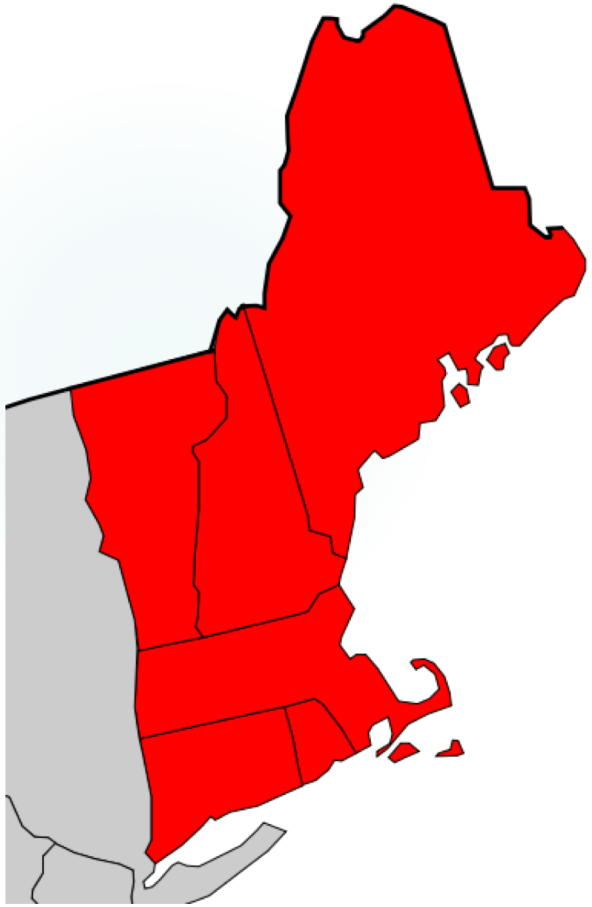
To test whether perceived risk of harm was a mediator of the effect of cSBA on adolescent alcohol use

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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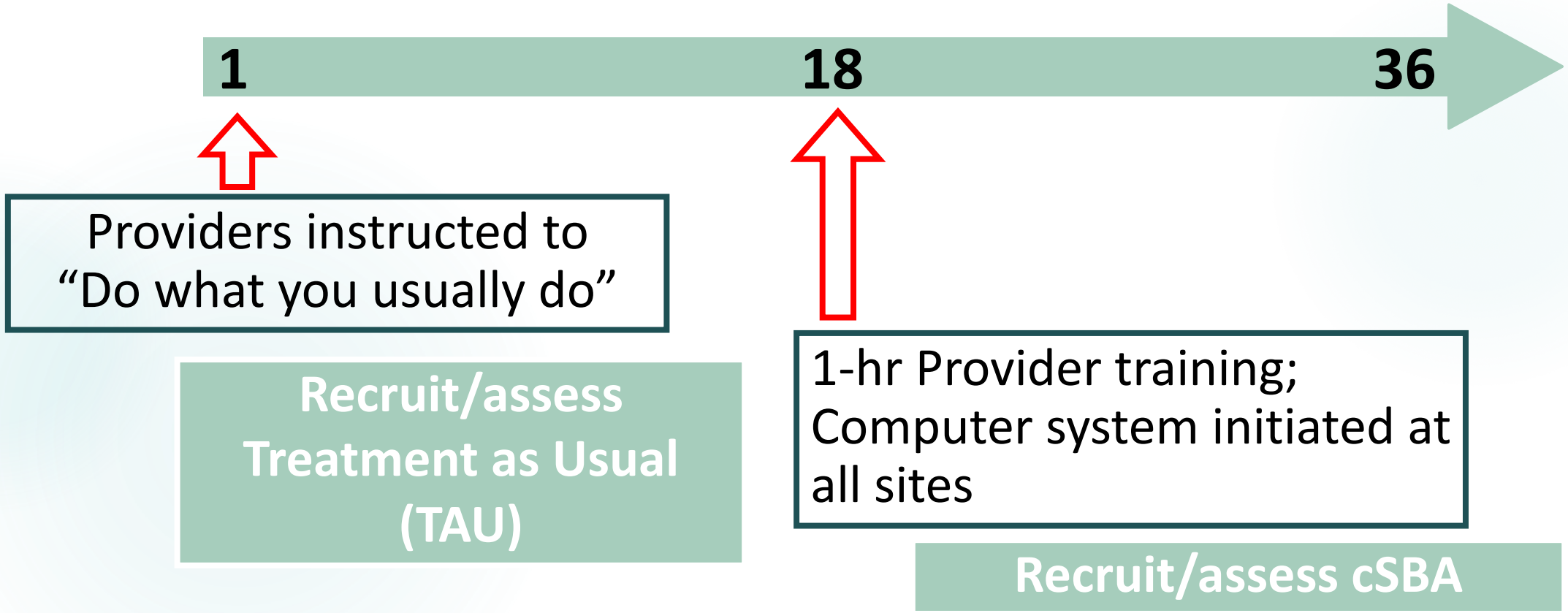
Study Design

Pretest-Posttest Comparative Effectiveness Trial (2005-2009)



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Intervention

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.

Online CRAFFT Screening Questions - Windows Internet Explorer

CRAFFT *Interactive*

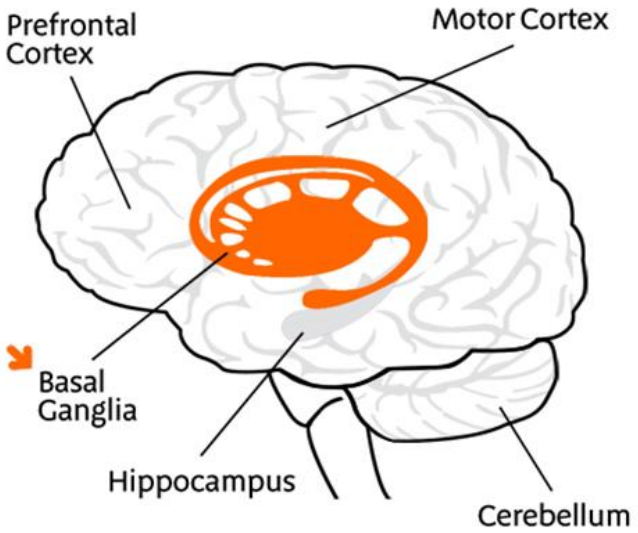
Welcome | CRAFFT Questions | Score | Information for You

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
Prefrontal Cortex	Leads to trouble making wise decisions.
Basal Ganglia	Impairs coordination, slows reflexes.
Hippocampus	Causes short-term memory loss.
Cerebellum	Affects balance and coordination.
Motor Cortex	Increases risk of stroke among young alcohol drinkers and drug users.



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[1]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.

[2]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.

[3]Daumann J, Fischermann T, et al. Memory-related hippocampal dysfunction in poly-drug ecstasy (3,4-methylenedioxymethamphetamine) users. Psychopharmacology (Berl). Aug 2005;180(4):607-611.

[4]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.

Cirrhosis

See alcohol-damaged liver

NEXT »

[1]Mann 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

- PRoH 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 PRoH variables ("Trying any alcohol" and "Binge drinking every weekend"):
  - Response options at each timepoint dichotomized into:
    "**High**" PRoH ("Moderate" or "Great" risk)
    "**Low**" PRoH ("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

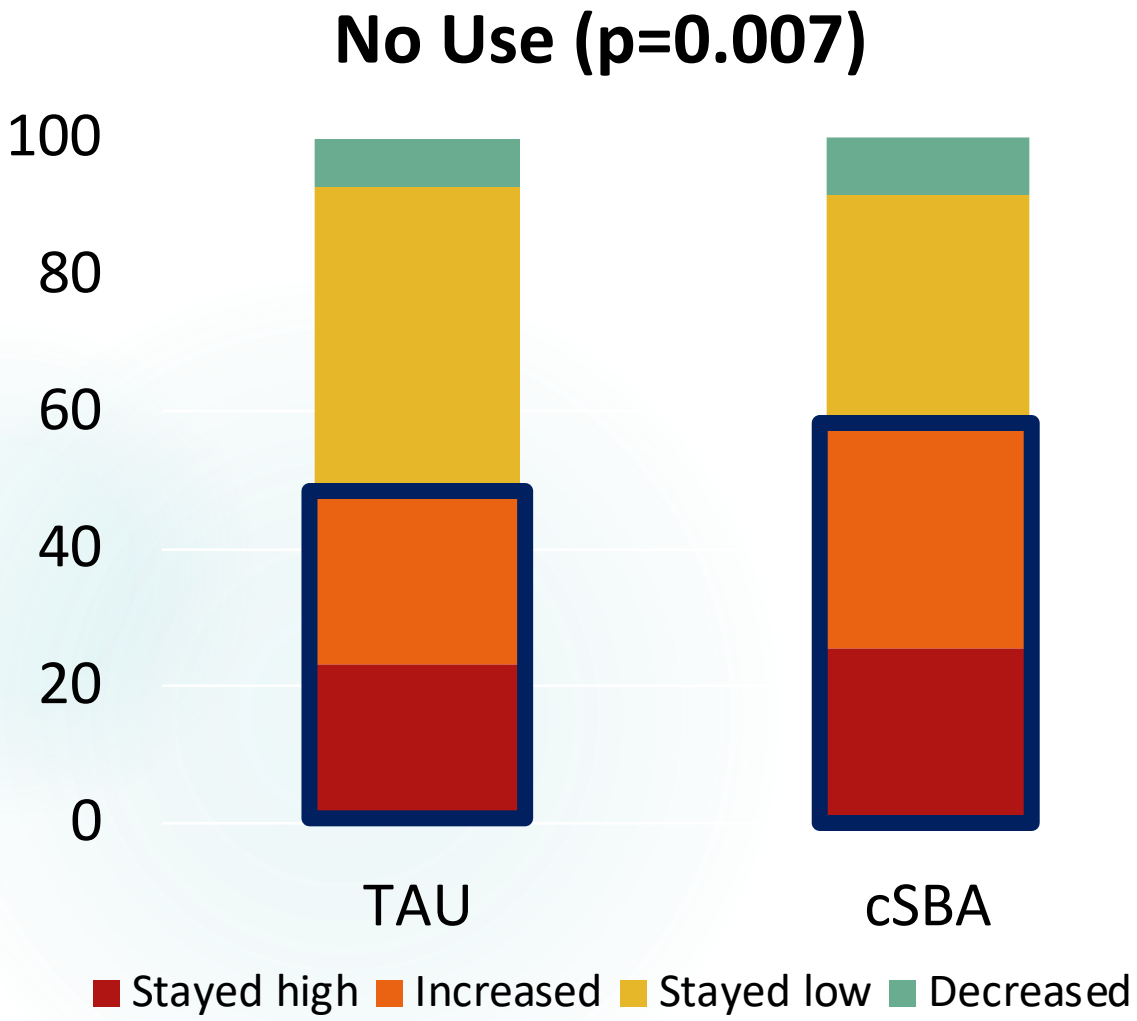
Baseline Characteristics

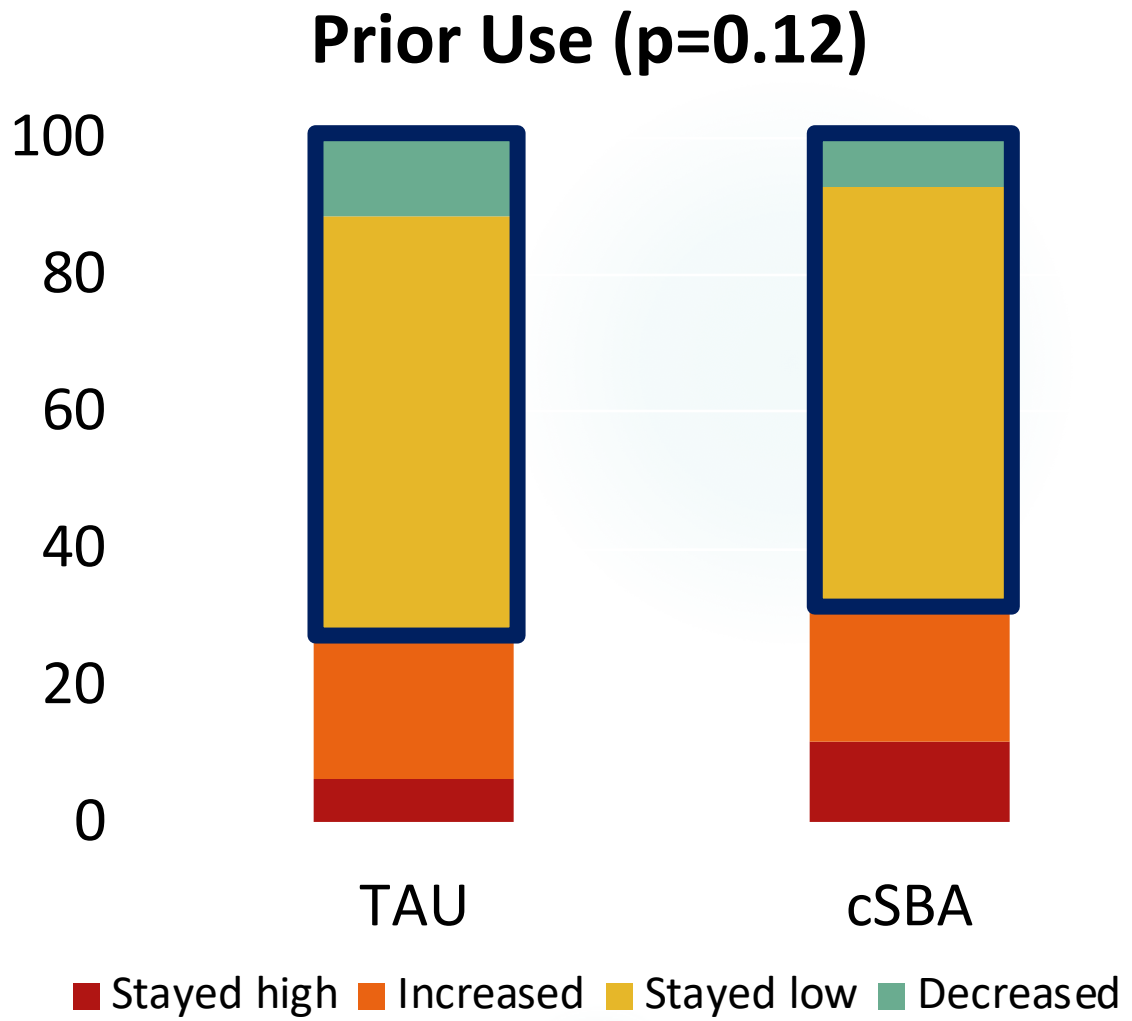
	No Use n (%)	Prior Use n (%)
Age (mean ± SD)	14.75 (1.9)	16.79 (1.3)
Male	666 (46.0)	210 (32.5)
Race/Ethnicity		
White non-Hispanic	915 (63.2)	438 (67.7)
Black non-Hispanic	169 (11.7)	169 (7.4)
Asian non-Hispanic	104 (7.1)	47 (7.3)
Hispanic	159 (11.0)	71 (11.0)
Other non-Hispanic	102 (7.0)	43 (6.6)

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)





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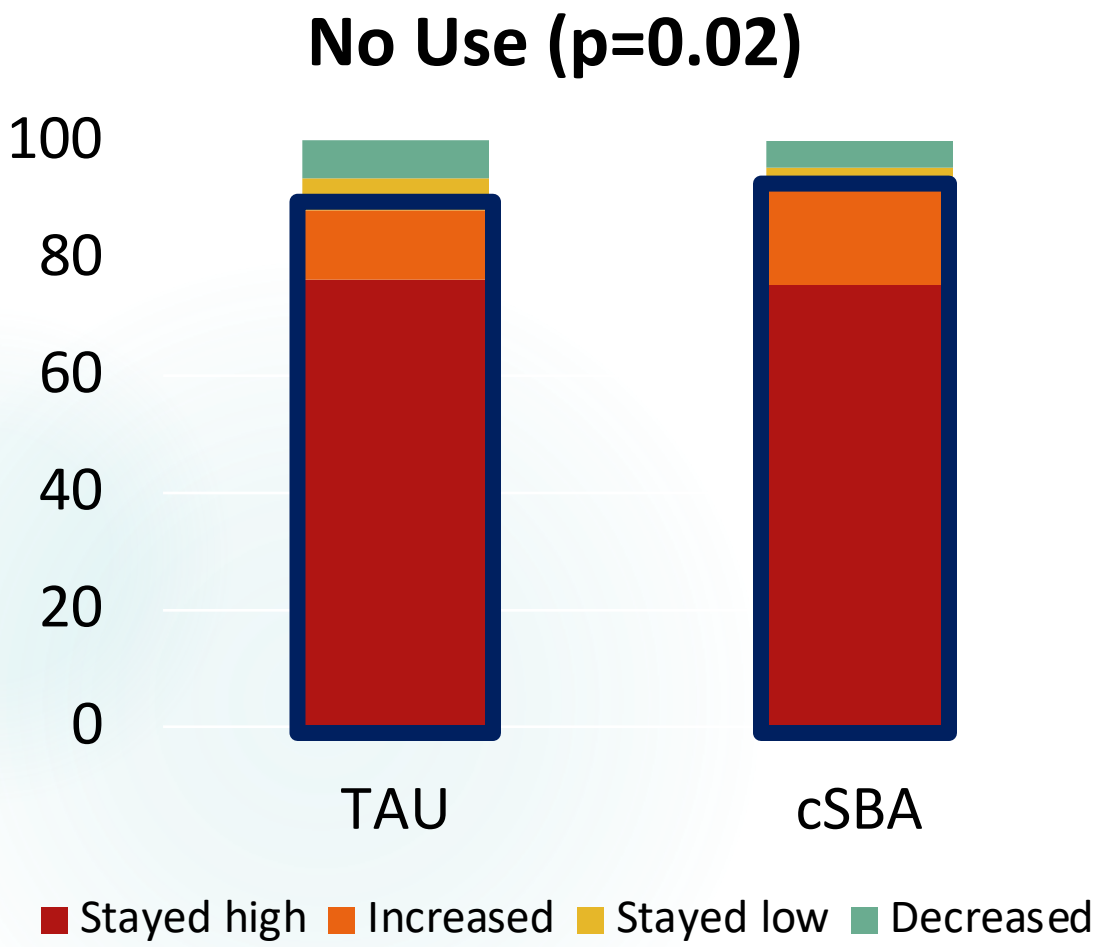
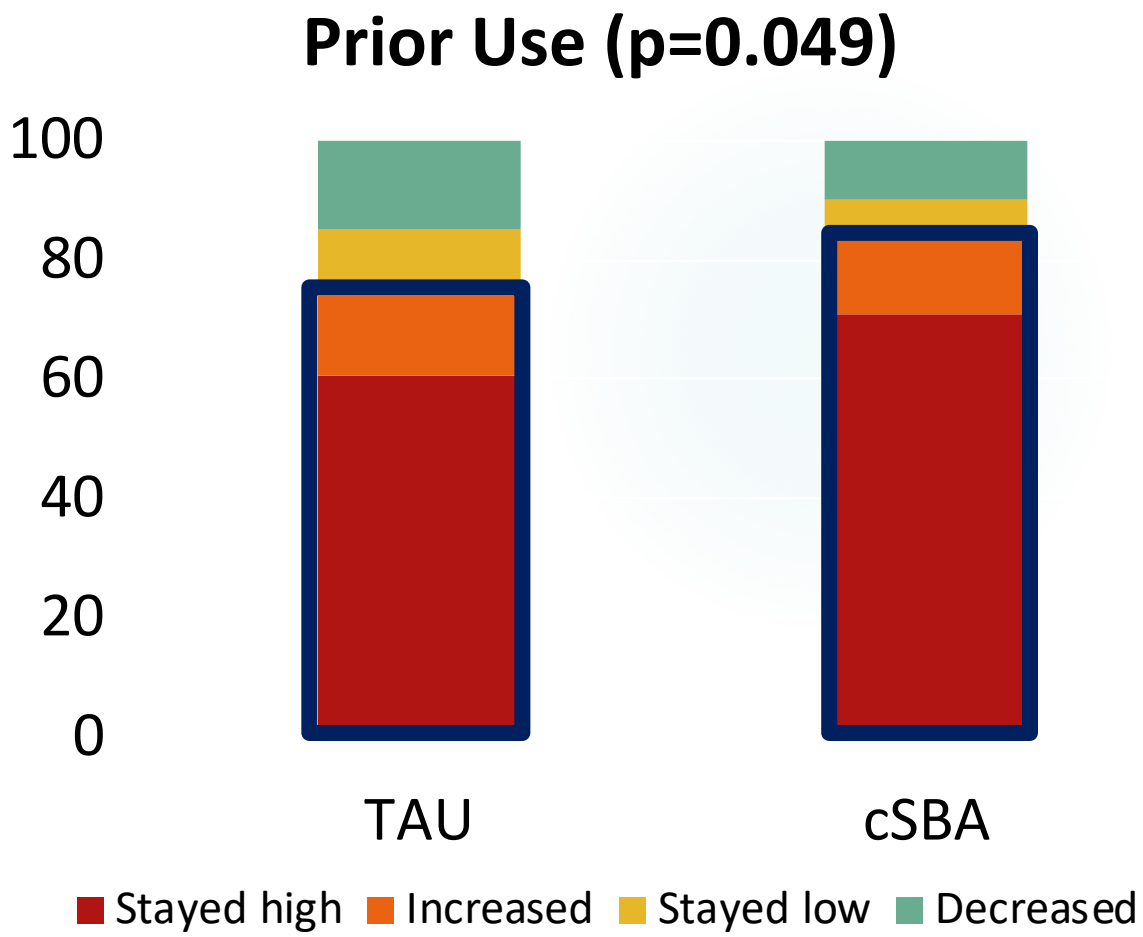
Perceived Risk of Harm (WEEKLY BINGE, 3 months)





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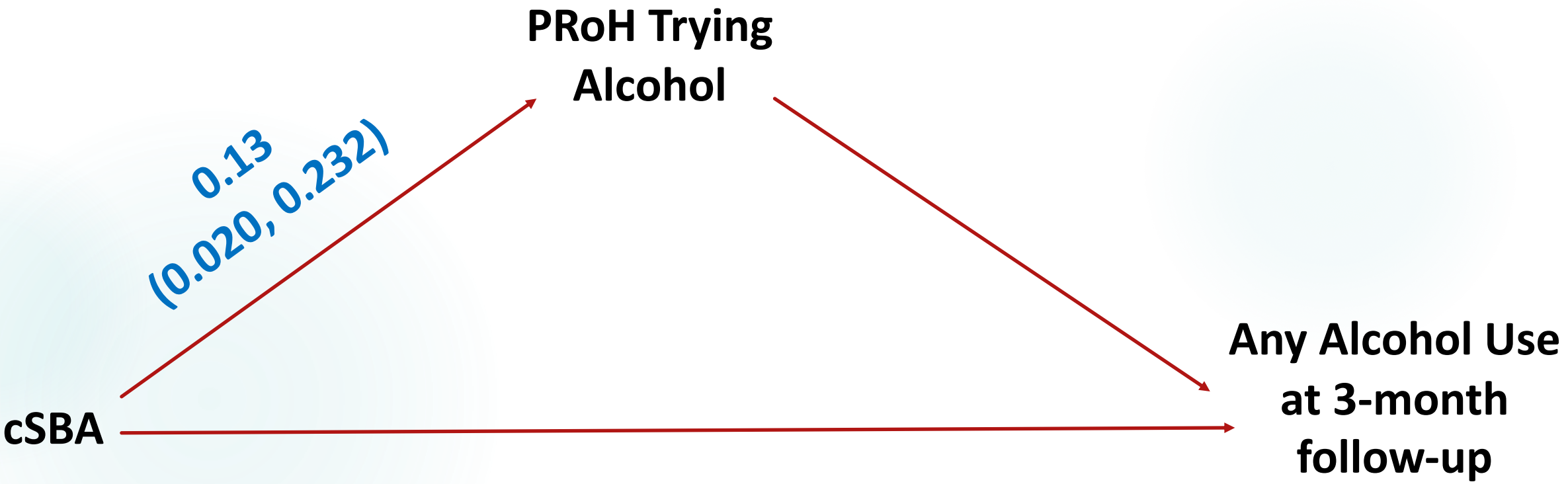
Mediation Results: No Use- Perceived Risk of Trying Alcohol

3-months Any Alcohol Use



Direct effect

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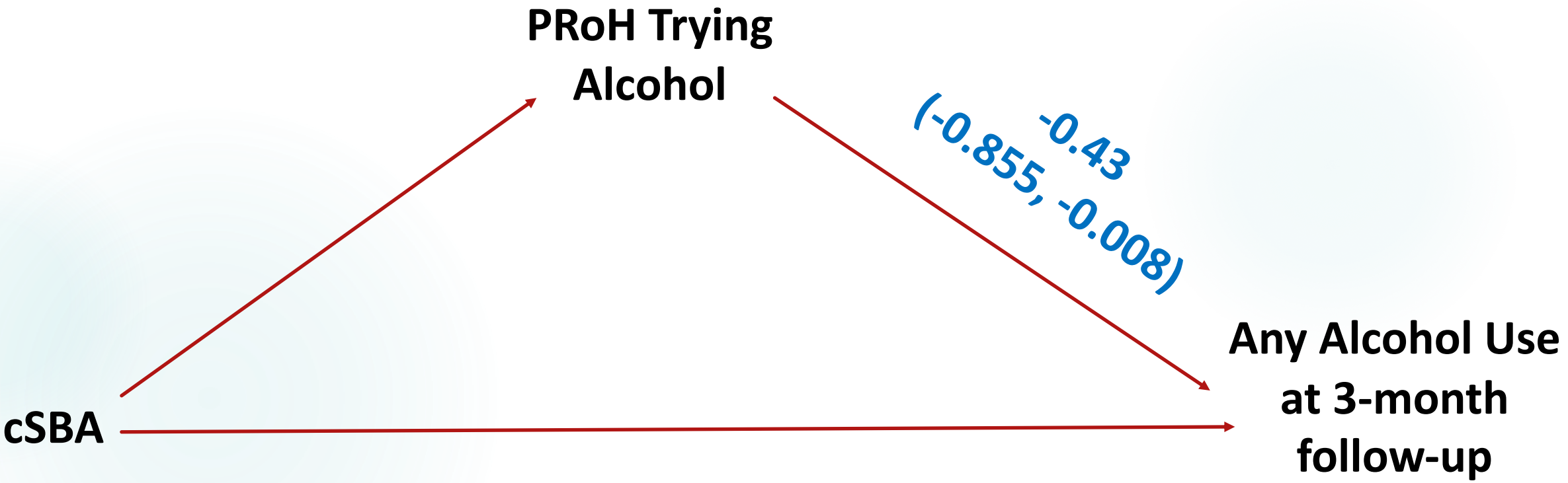
Mediation Results: No Use- Perceived Risk of Trying Alcohol

3-months Any Alcohol Use



Direct effect

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Mediation Results: No Use- Perceived Risk of Trying Alcohol

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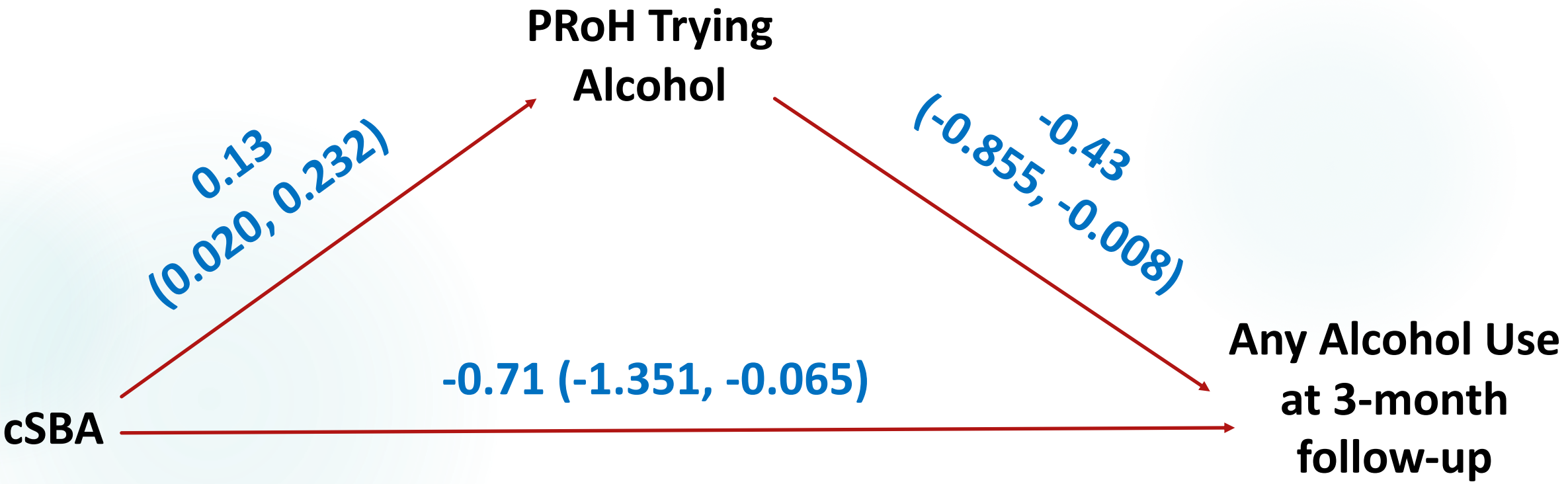

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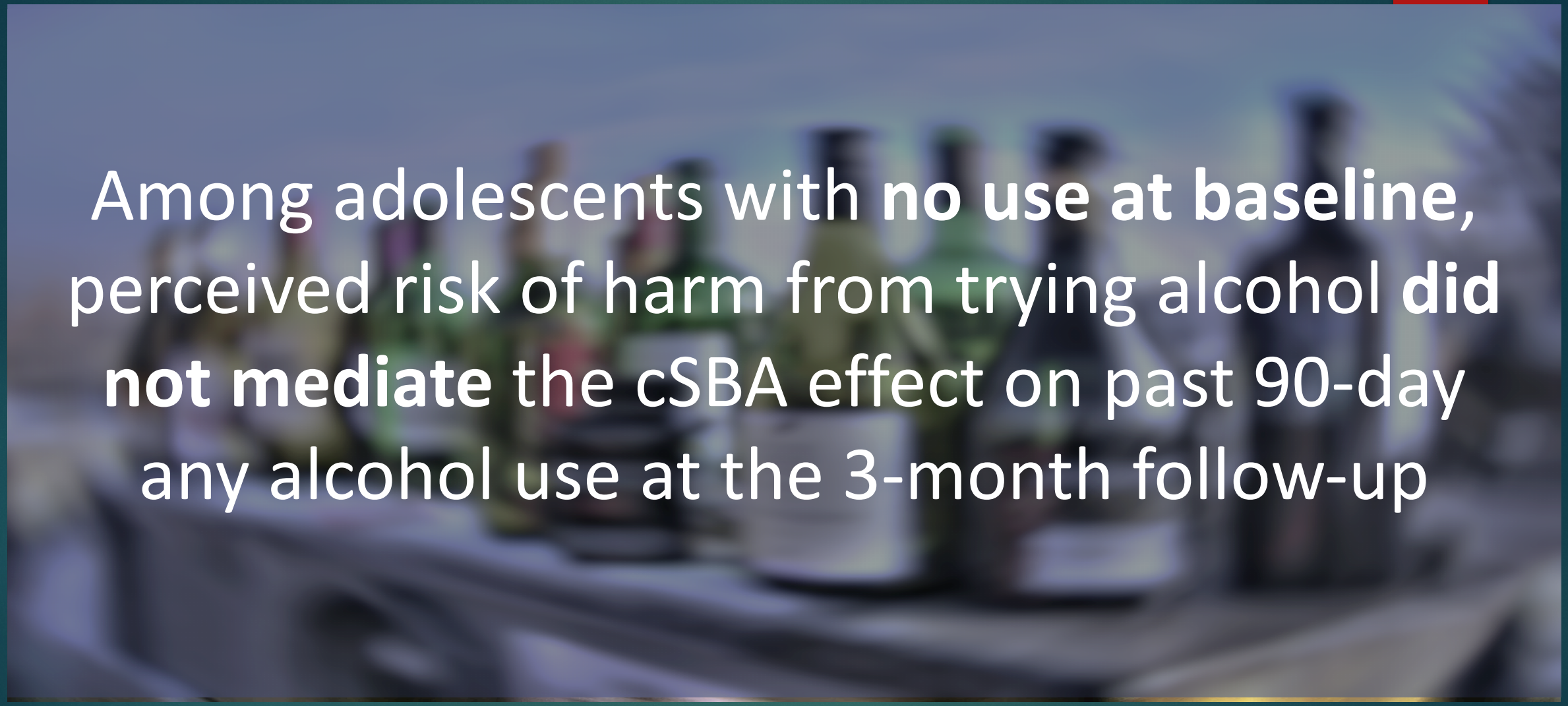

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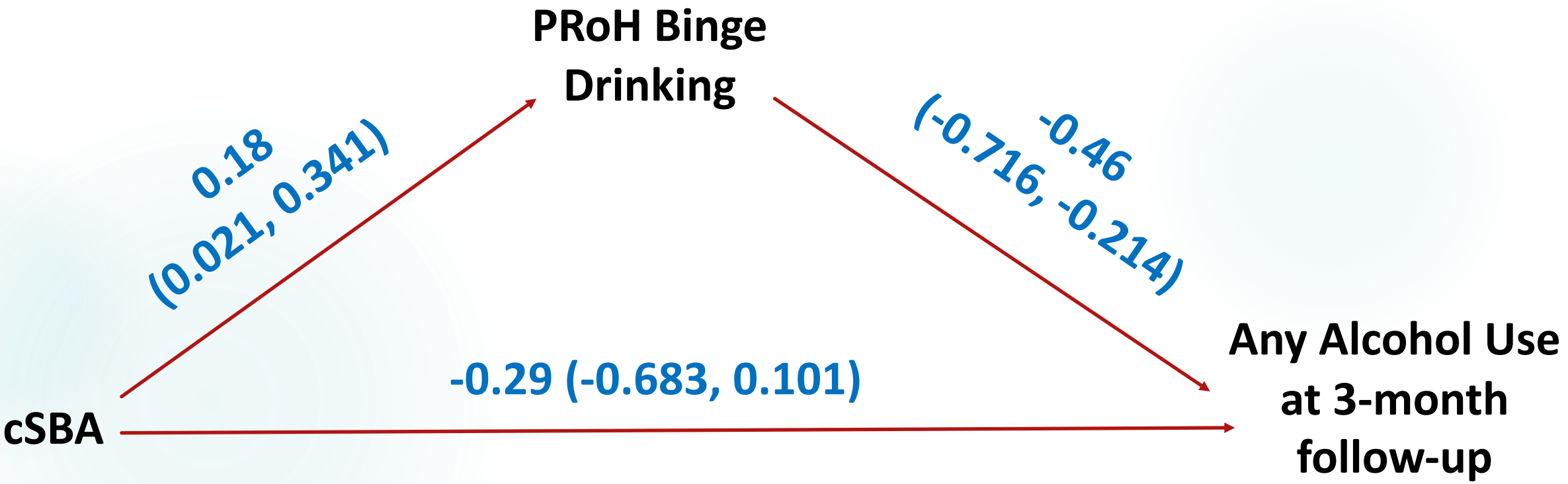
Mediation Results: Prior Use- Perceived Risk of Binge Drinking

3-months Any Alcohol Use



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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

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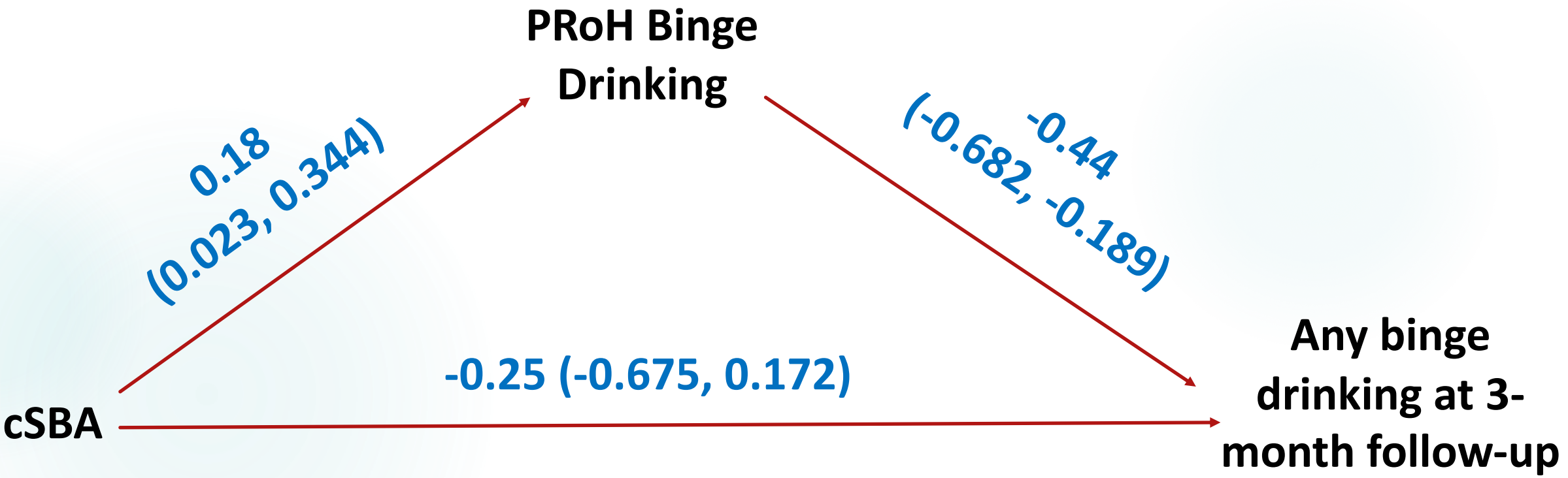
Mediation Results: Prior Use- Perceived Risk of Binge Drinking

3-months binge drinking



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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

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Summary of Findings

- cSBA →→ INCREASED perceived risk of harm
- Higher perceived risk →→ DECREASED likelihood of alcohol use
- PRoH did not mediate cSBA effect on alcohol use *among adolescents with no prior drinking at baseline*
- PRoH 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' PRoH 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

Acknowledgements

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Thank you!