




# WOOP as a Brief Alcohol Intervention Led by Lay Coaches in College Settings

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## Abstract

Heavy drinking is a major public health concern, particularly among young adults who often experience fear of being stigmatized when seeking help for alcohol-related problems. To address drinking concerns outside clinical settings, we tested the feasibility of a novel imagery-based behavior change strategy led by student lay interventionists in a college setting. Participants were adults recruited on a college campus and were randomized to either learn the four steps of WOOP (Wish, Outcome, Obstacle, and Plan) or to learn a format-matched Sham WOOP (Wish, Outcome, “Outcome,” and Plan). Both WOOP and Sham WOOP interventions were taught by student lay interventionist. We found that the WOOP intervention group reported fewer heavy drinking days ( $\geq 5$  drinks for men or  $\geq 4$  drinks for women, measured using the Alcohol Timeline Follow-Back Method) compared to the Sham group at the 1-month and 2-month follow-ups. WOOP, when taught by student lay interventionists in a single session, demonstrated the feasibility of reducing heavy drinking. WOOP shows promise as a low-cost and scalable intervention for reducing heavy drinking in nonclinical settings.

## Keywords

alcohol, WOOP, mental contrasting with implementation intentions (MCII), self-regulation, lay interventionist, college settings

## Highlights

1. Heavy drinking is a major public health concern, particularly among young adults who often experience fear of being stigmatized when seeking help for alcohol-related problems.
2. WOOP is a novel, imagery-based behavior change strategy that was feasible to reduce drinking in a college setting.
3. Advantages of WOOP include that a lay person can teach individuals to use the WOOP strategy on their own, which makes it scalable and suitable for young adults who prefer self-reliance.
4. WOOP is a promising, low-cost, and scalable self-regulation strategy to reduce heavy drinking in non-clinical settings.

Heavy drinking among young adults between the ages of 18 to 34 years is one of the most common yet preventable public health issues (Kanny et al., 2018). Alcohol use impairs academic performance, strains personal relations, and increases risk of assault and injuries including motor vehicle accidents

(Centers for Disease Control and Prevention, 2022; National Institute on Alcohol Abuse and Alcoholism, 2023). Heavy drinking is defined as five or more drinks per day for men and four or more drinks per day for women according to the National Institute of Alcohol Abuse and Alcoholism (National Institute on Alcohol Abuse and Alcoholism, 2023). More than one in three college students (33 %) report having engaged in heavy drinking within the past month (Substance Abuse and Mental Health Services Administration [SAMHSA], & Center for Behavioral Statistics and Quality, 2019). To discourage heavy drinking, the U.S. Preventive Services Task Force guidelines recommend screening for unhealthy alcohol use in primary care settings in adults, 18 years or older,

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and providing persons engaged in hazardous drinking patterns with brief behavioral counseling (Curry et al., 2018). However, many young adults are reluctant to seek help in clinical settings because they fear being stigmatized or punished, and many prefer self-reliance (Berridge et al., 2018; Radez et al., 2021). Therefore, young adults should benefit from brief alcohol interventions in nonclinical settings.

Brief alcohol interventions, delivered in college settings, have been found to reduce problematic drinking (Prosser et al., 2018). Common examples of brief alcohol interventions include personalized normative feedback, psychoeducation, and brief motivational interviewing. While brief alcohol interventions were found to be more effective than assessment-only control groups, evidence demonstrating that these brief alcohol interventions are more effective than active or sham control groups remains sparse (Das et al., 2016; DiClemente et al., 2017). Thus, rigorous research into effective strategies to address unhealthy alcohol use within nonclinical college settings is needed.

WOOP (the acronym stands for Wish, Outcome, Obstacle, and Plan) is a behavior change strategy based on 20+ years of experimental research on self-regulation (Oettingen, 2012; Oettingen & Gollwitzer, 2019). WOOP is grounded in Fantasy Realization Theory (Oettingen, 1999, 2012) which specifies distinct modes of thought, the most relevant being mentally contrasting the desired future with the main obstacle of reality. Mental contrasting (the WOO in WOOP) has been found to lead to immediate and persistent goal striving when the desired future is attainable, and to relinquishing goal pursuit if the endeavor is futile, thus saving effort and energy. The conceptual framework of WOOP incorporates imagery that effectively creates implicit associations between the desired future and the obstacle of reality (Kappes & Oettingen, 2014; Wittleder et al., 2020). These implicit associations in turn provide the direction as well as the energy to effectively problem solve and to persistently strive for the goal (Kappes et al., 2012). Persistent goal striving can be further strengthened by complementing mental contrasting with if-then plans (the P in WOOP). These if-then plans are theoretically based on the mind-set theory of action phases and have been consistently found to facilitate goal implementation (Gollwitzer, 1999, 2012, 2014).

WOOP can be taught by non-clinicians and within non-clinical settings (Oettingen, 2012). The WOOP strategy uses imagery and involves distinct goal-related concepts comprising a set order of four steps. People (1) identify an important Wish (e.g., “*becoming the person I was before I started drinking*”), (2) identify and vividly imagine the best Outcome of fulfilling this wish (e.g., “*feel energetic and accomplished*”), (3) identify and vividly imagine the main inner Obstacle that stands in the way of fulfilling the wish (e.g., “*feel pressured to drink by friends*”), and (4) formulate and imagine an if-then plan to overcome the obstacle: “If . . . obstacle, then I will . . . engage in behavior or thought to overcome obstacle” (“*If I feel pressured by my friends to order another drink, then*

*I will tell them: Not today, maybe tomorrow!*”). Numerous experimental studies have revealed the centrality of mentally elaborating on the four steps of WOOP. For instance, when participants elaborate on a second important outcome instead of their critical obstacle (Wish, Outcome, **Outcome**, and Plan), the beneficial effects on behavior change fail to appear (Duckworth et al., 2013; Oettingen et al., 2001). Thus, positive imagery of outcomes without an obstacle is futile for behavior change.

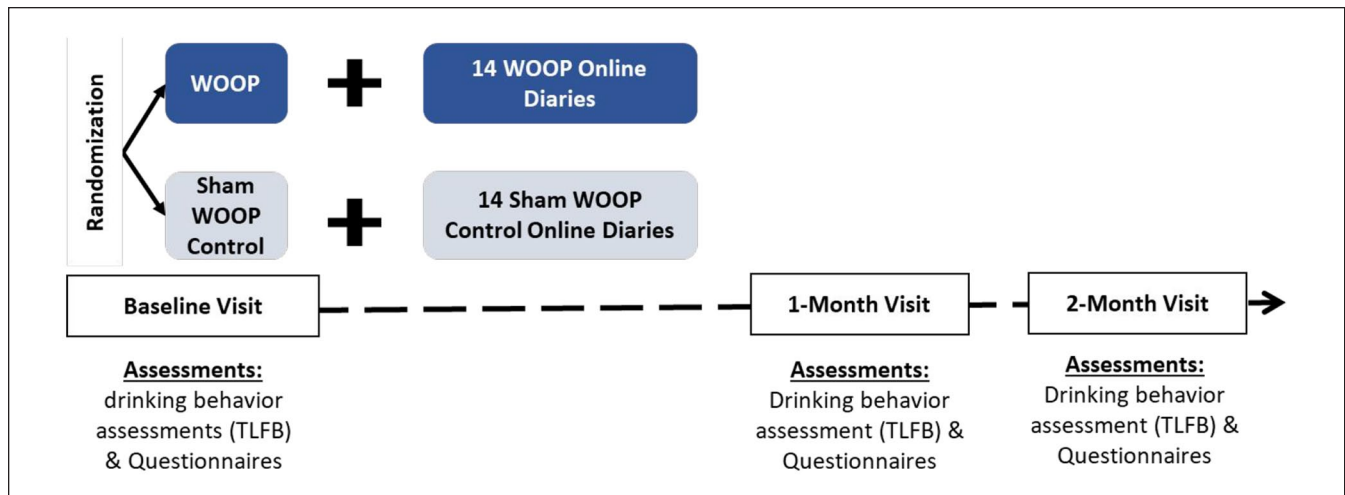
WOOP can promote various changes in health behaviors (Oettingen & Gollwitzer, 2018). For instance, WOOP has encouraged vigorous exercise and weight loss for over 1 year (Marquardt et al., 2017) and has improved adherence to a healthy diet for up to 2 years (Stadler et al., 2009, 2010). Research also has shown that WOOP reduced drinking among a community sample over 1 month when the intervention was delivered online (Wittleder et al., 2019). To address the need for effective strategies to address heavy drinking in nonclinical settings, in this research, we investigated the feasibility of WOOP to help young adults reduce their heavy drinking when delivered by student lay interventionists in a college setting. We hypothesized that WOOP would reduce heavy drinking, defined as five or more drinks on any day for men or four or more drinks for women (National Institute on Alcohol Abuse and Alcoholism, 2023), compared to a format-matched Sham WOOP control intervention. We also report drinking days per week and drinks per drinking day. Other indicators of feasibility were adherence and acceptability, which were assessed in multiple ways: interventionist rating, participants’ self-report, process measures, and content analysis.

## Method

### Overview and Study Design

We randomized participants to either the WOOP intervention or a Sham WOOP control intervention using the web-based Research Randomizer tool (Urbaniak & Plous, 2013). While this study design precluded blinding the interventionists to study arm assignment, it accounted for potential confounding effects due to the individual delivery style of the interventionists. Further, using a Sham intervention as control group allowed participants to be blind to arm assignment throughout the study.

Participants completed in-person assessments at baseline (pre- and postintervention), 1-month follow-up, and 2-month follow-up (see Figure 1). To link responses over time, participants generated a de-identified code: the first three letters of the city/town they were born in (e.g., New York = NEW), the last two digits of their student ID (e.g., jk1230 = 30), and the day they were born (e.g., 12-07-2002 = 07). Participants’ emails were collected for sending daily diaries and stored separately to ensure anonymity. Compensation was \$10 for completing each study visit, adding up to a total of \$30 for completing all assessments.



**Figure 1.** Study Design Overview.

### Participants and Setting

Participants had to be at least 18 years old and were recruited on campus using poster advertisements (“Worried about your drinking?”). Students were least in their sophomore year. However, being a current student was not a requirement. There were no additional eligibility criteria.

### Student Lay Interventionists

Lay interventionists, students without a clinical degree or license, were trained by the principal investigator. Trainees started by familiarizing themselves with the study manual, which provided a step-by-step guide on teaching WOOP. Then, they participated in practice WOOP sessions with the principal investigator, where they role-played as both participants and interventionists. In addition, the principal investigator observed the new interventionist during their first two sessions with a participant. The total training time required was 10 to 15 hours.

### WOOP Intervention Arm

The intervention was designed to teach participants to use WOOP for wishes of different life domains and time frames. Participants were led to practice WOOP by applying it (1) to an important and feasible but challenging wish for the upcoming four weeks pertaining to any life domain, (2) to an alcohol-related wish for the upcoming four weeks, and (3) to a wish for the next 24 hours pertaining to any life domain.

For the first wish, the interventionist asked participants to think about a very important wish that they can achieve in the next four weeks but that is still challenging. The wish could pertain to any life domain. Then the interventionist guided participants through the four steps of WOOP: (1) formulating the wish, (2) identifying and imagining the best outcome, (3) identifying and imagining the critical inner obstacle, and (4) formulating an “if . . . obstacle, then I will . . . action to

overcome obstacle” plan. Thus, the fourth step followed the format: If (here you name your obstacle), then I will (here you name your action to overcome the obstacle). After completing the first WOOP, the interventionist reviewed each step again and encouraged participants to use the WOOP strategy for wishes of all types and life domains during their everyday lives.

For the second wish, the interventionist encouraged participants to think about a wish that pertained to reducing their drinking in the next few weeks. Participants received a worksheet and went through the steps on their own by first writing down their wish, then the respective best outcome, inner obstacle, and if-then plan. Afterward, the interventionist reviewed the steps with the participants to ensure that the steps were followed appropriately.

For the third wish, the interventionist asked participants to think about an important, feasible, and challenging wish that participants could achieve within the next 24 hour. The 24-hour wish could have pertained to any life domain. Participants received a worksheet and went through the four steps of WOOP on their own and then reviewed their exercise with the interventionist.

For the following 14 days, participants received daily emails with links to surveys to remind them to practice WOOP. Each day the survey asked participants to enter their wish, then identify and imagine the respective best outcome, identify, and imagine their central inner obstacle, and make an if-then plan.

### WOOP Sham Control Arm

The Sham WOOP control intervention followed a format-matched protocol as to the WOOP intervention. Participants in the Sham WOOP control arm also completed an in-person session with the interventionist and received 14 daily emails with links to surveys to remind them to practice WOOP. However, the four steps of WOOP were modified (differences in bold and

italics): (1) formulating the wish, (2) identifying and imagining the best outcome, (3) identifying and imagining *the second-best outcome*, and (4) formulating an “if . . . *outcome*, then I will . . . *feeling*” plan. Thus, the plan followed the format: If (here you name your *outcome*), then I will (here you name your *feeling*).

## Measures

### Drinking Outcomes

At baseline, 1-month, and 2-month follow-ups, participants completed the Alcohol TLFB (Sobell & Sobell, 1992), referencing the past 14 days. The Alcohol TLFB has proven psychometrically sound when administered self-guided (Pedersen et al., 2012). Participants were given brief educational information about what constitutes one standard drink before they reported the number of standard drinks consumed each day. To ensure a reliable assessment of the drinking outcomes, we included data of participants who remembered at least 9 out of 14 days. Heavy drinking days, defined as more than four drinks on any day for men or more than three drinks for women (Mekonen et al., 2021) were calculated. We assessed the changes from baseline to 1-month and 2-month follow-ups regarding (1) the **average number of heavy drinking days** over the previous 14 days and (2) the **percentage of participants** who reduced heavy drinking days. We also report differences regarding the **average number of drinking days** and the **average number of drinks per drinking day**.

### Feasibility Outcomes: Adherence Measures

**Interventionist Rating:** At baseline after the in-person WOOP and Sham WOOP sessions, interventionists rated each participant’s adherence to use WOOP (three items, e.g., How well did the participant understand how to use WOOP?). All items were rated on a scale from *Not at all* (1) to *Very* (7), see Table 2 for all questions. Interventionists also indicated whether the participants’ second WOOP pertained to alcohol or another life domain. **Participant Self-Report:** At the 1-month and 2-month follow-ups, as indicators of adherence, participants provided an estimate of how many times per week they had used WOOP or Sham WOOP. **Process Measures:** We assessed the average number of WOOP diaries that participants completed via email prompts over the 14 days following the initial in-person WOOP session. Thus, possible scores ranged from 0 to 14.

### Feasibility Outcomes: Acceptability Measures

**Interventionist Rating:** At baseline after the in-person WOOP and Sham WOOP sessions, interventionists rated each participant’s acceptability of using WOOP (four items; e.g., How open was the participant to use the WOOP strategy?) All items were rated on a scale from *Not at all* (1) to *Very* (7), see Table 2 for all questions. **Participant Self-Report:** At the 2-month follow-up, as indicators of acceptability, participants

indicated how much they liked using WOOP and to what extent they were interested in learning more about WOOP or similar strategies. Items were rated on a scale from *Not at all* (1) to *Very* (7), see Table 2 for all questions. **Content Analysis:** During the assessment at the 2-month follow-up, participants answered two open-ended questions about (1) how their alcohol consumption had changed and (2) how their everyday life in general had changed. Two raters, blind to study arm assignment, coded the valence of participants’ responses as *positive change* (1), *negative change* (2), or *no change* (3). To assess inter-rater reliability, we computed Cohen’s Kappa coefficient. The overall agreement on the changes in alcohol consumption was 0.85, 95% CI [0.65, 1.04], and agreement on the changes in everyday life was 0.86, 95% CI [0.68, 1.03].

### Baseline Measures

**Alcohol Use Disorders Identification Test (AUDIT).** Participants completed the AUDIT, a 10-item survey developed by the World Health Organization (WHO) to assess risky alcohol consumption, drinking behaviors, and possible alcohol-related problems (Babor et al., 2001). Sum scores of eight and higher indicated hazardous alcohol use ( $\alpha = .83$ ).

**Readiness to Change Drinking.** Participants completed the Readiness to Change Drinking Scale (RTC), which comprises three subscales reflecting the stages of change: pre-contemplation, contemplation, and action (Rollnick et al., 1992). Answers were combined for each of the three stages (four items each) ( $\alpha$ s = .69 to .83) and participants were assigned to the stage of change based on the highest of the three scale scores, with ties placed into the stage farthest along the continuum of change.

### Data Analytic Plan

All data were analyzed using the Statistical Package for the Social Sciences software, version 29.0 (SPSS Inc., Chicago, USA). Descriptive statistics included percentages for categorical variables and means and standard deviations for continuous variables. Dropout and study arm differences in baseline characteristics were examined using Mann–Whitney U tests for continuous variables and Fisher’s exact tests for categorical variables. To investigate differences in drinking outcomes, we used Pearson’s *chi*-square test and Student’s *t*-test, as well as multiple linear and logistic regression models to control for baseline characteristics. A two-sided *p*-value < 0.05 was considered statistically significant.

## Results

### Sample Characteristics

Participants ( $N = 86$ , 54 = female, 31 = male, 1 = missing) were on average 24.9 years of age ( $SD = 6.3$ ). Although many participants identified as White/Caucasian (40.7%), the study



**Table 1.** Baseline Characteristics.

Measures	Total, <i>n</i> = 86	WOOP, <i>n</i> = 41	Sham control, <i>n</i> = 45
	<i>n</i> (%)	<i>n</i> (%)	<i>n</i> (%)
Gender			
Female	54 (62.8%)	25 (61.0%)	29 (64.4%)
Male	31 (36.0%)	16 (39.0%)	15 (33.3%)
Race			
Black, of African descent	17 (19.8%)	11 (26.8%)	6 (13.3%)
Alaskan Native	–	–	–
American Indian (Native American)	1 (1.2%)	1 (2.4%)	–
Asian/Pacific Islander	23 (26.7%)	12 (29.3%)	11 (24.4%)
Hispanic/Latinx	13 (15.1%)	4 (9.8%)	9 (20.0%)
White, Caucasian, European descent	35 (40.7%)	16 (39.0%)	19 (42.2%)
Other	5 (5.8%)	3 (7.3%)	2 (4.4%)
RTC			
Precontemplation	28 (32.6%)	12 (29.3%)	16 (35.6%)
Contemplation	28 (32.6%)	14 (34.1%)	14 (31.1%)
Action	30 (34.8%)	15 (36.6%)	15 (33.3%)
	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )	<i>M</i> ( <i>SD</i> )
Age	24.86 (6.26)	25.88 (6.75)	23.91 (5.69)
Heavy drinking days (via TLFB)	2.69 (3.06)	2.90 (3.09)	2.49 (3.06)
Drinking Days (via TLFB)	5.73 (3.67)	6.03 (3.74)	5.44 (3.63)
Drinks per Drinking Day (via TLFB)	3.72 (2.54)	3.39 (1.95)	4.05 (2.49)
AUDIT	11.35 (7.22)	10.41 (6.21)	11.91 (8.07)

Note. There were no significant differences between study arms, Mann–Whitney U tests for categorical variables and Mann–Whitney U tests for continuous variables,  $p_s > .13$ . RTC = readiness to change; TLFB = timeline follow-back; AUDIT = Alcohol Use Disorder Identification Test; Multiple answers were possible for race; WOOP = wish, outcome, obstacle, and plan.

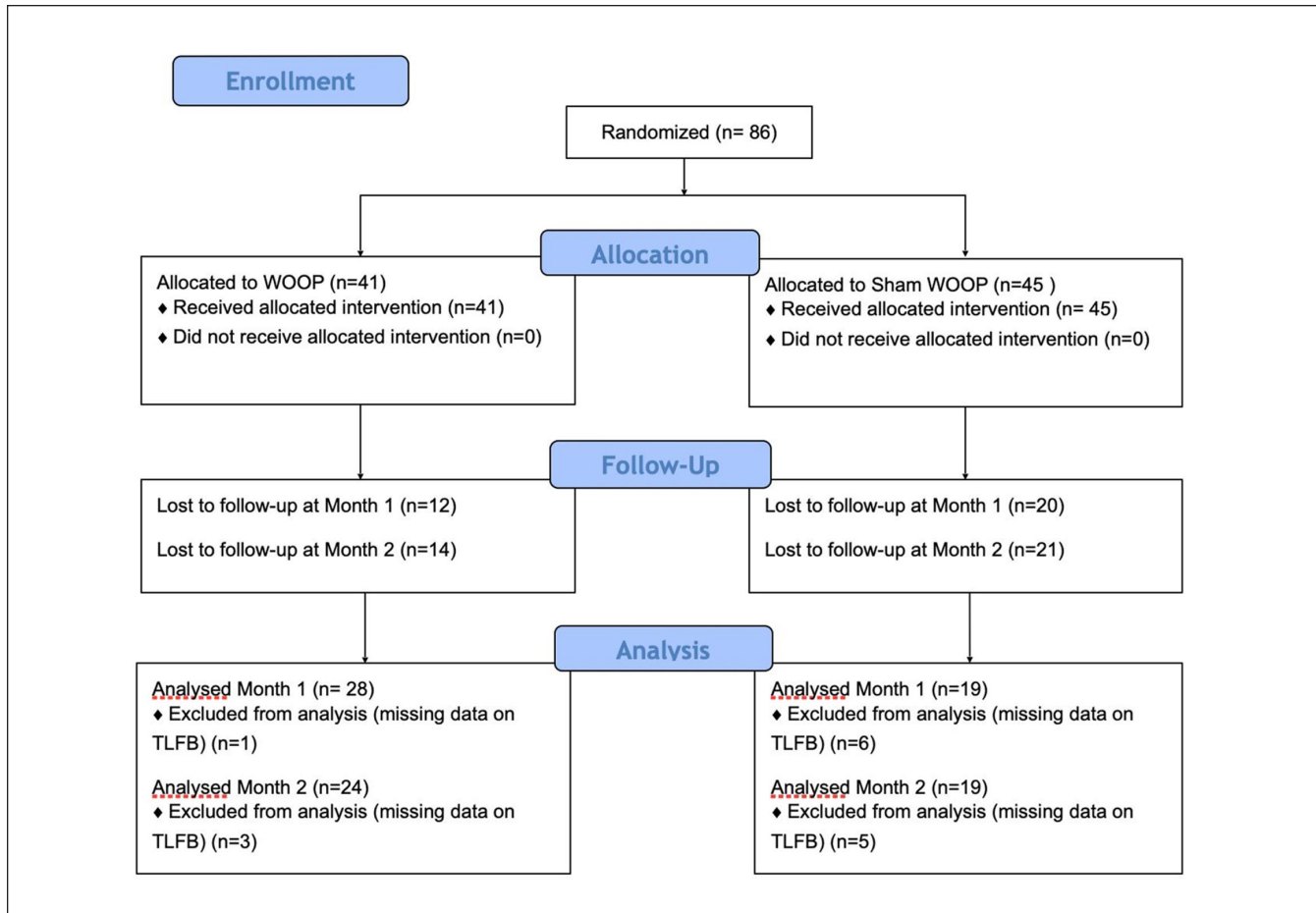
sample was diverse with 19.8% of participants identifying as African American/Black, 26.7% Asian/Pacific Islander, 15.1% Hispanic/Latino/a/x. Most participants (65.1%) reported hazardous drinking using the cut-off point of eight on the AUDIT ( $M = 11.35$ ,  $SD = 7.22$ ). Randomization checks showed the study arms were matched for baseline factors (see Table 1). Delivery time was similar in both study arms (WOOP:  $Md = 57$  min,  $IQR = 37$  to  $76$  min; Sham WOOP Control:  $Md = 58$  min,  $IQR = 44$  to  $83$  min).

Retention was 65.5% ( $n = 56$ ) in participants completing at least one of the two follow-up visits, see Figure 2. Among participants who reported to be in the action stage of change, 58.6% ( $n = 29$ ) of participants were lost to follow-ups, which was higher compared to 20.07% ( $n = 27$ ) of participants in the contemplation stage and 20.07% ( $n = 28$ ) of participants in the precontemplation stage,  $\chi^2(2, N = 84) = 11.38$ ,  $p = .003$ . While not statistically significant, 44.4% ( $n = 45$ ) of participants were lost to follow-up in the Sham control arm compared to 24.4% ( $n = 41$ ) of participants in the WOOP arm,  $\chi^2(1, N = 86) = 3.80$ ,  $p = .051$ . Attrition was not associated with gender,  $p = .45$ , age,  $p = .90$ , or baseline drinking variables: AUDIT,  $p = .24$ , drinks per drinking day,  $p = .75$ , drinking days per week,  $p = .73$ , or heavy drinking days,  $p = .47$ .

## Alcohol Outcomes

**Average Number of Heavy Drinking Days.** At the 1-month follow-up, we found that, on average, WOOP participants reported reduced heavy drinking by  $-1.25$  days ( $SD = 1.56$ ) (assessed via TLFB over the previous 14 days), which was statistically different from Sham WOOP participants who reported increasing heavy drinking on average by  $0.50$  days ( $SD = 2.37$ ),  $t(45) = 2.28$ ,  $p = .027$ , left panel in Figure 3A. At the 2-month follow-up, WOOP participants reported reduced heavy drinking by  $-1.12$  days ( $SD = 1.32$ ) (assessed via TLFB over the previous 14 days), which was statistically different from Sham WOOP participants who reported increasing heavy drinking by  $0.21$  days ( $SD = 1.32$ ),  $t(41) = 2.36$ ,  $p = .023$ , see right panel in Figure 3A. Furthermore, when controlling for age, gender, and baseline drinking variables (RTC and AUDIT scores) in a regression analysis, the difference between WOOP and Sham WOOP participants remained statistically significant at 1-month follow-up,  $\beta = .30$ ,  $t(45) = -2.10$ ,  $p = .042$ , and 2-month follow-up,  $\beta = -.30$ ,  $t(31) = -2.07$ ,  $p = .045$ .

**Proportion of Participants With Reductions in Heavy Drinking Days.** At the 1-month follow-up, 18 of 28 (64.29%) WOOP participants and 8 of 19 (42.11%) Sham WOOP participants



**Figure 2.** Participant Flowchart.

Note. Participants lost to follow-up were unreachable for Month 1 and Month 2 assessments, respectively. Exclusions from the analysis encompassed participants unable to recall over 5 out of the 14 days of alcohol consumption reporting. TLFB = timeline follow-back.

reported a reduction in heavy drinking days (assessed via TLFB over the previous 14 days), which was not statistically different,  $\chi^2(1, N = 47) = 2.25, p = .133$ , see left panel in Figure 3B. However, at the 2-month follow-up, we found that 14 of 24 (58.33%) WOOP participants compared to 5 of 19 (26.33%) Sham WOOP participants reported a reduction in heavy drinking days (assessed via TLFB over the previous 14 days), which was a significantly higher proportion,  $\chi^2(1, N = 43) = 4.41, p = .036$ , see right panel in Figure 3B.

**Other Drinking Outcomes.** The difference in average drinking days at 1-month was  $-1.29$  days ( $SD = 2.12$ ) in WOOP versus  $-0.11$  days ( $SD = 3.01$ ) in Sham WOOP,  $p = .12$ , and at 2-months, the difference was  $-1.34$  days ( $SD = 2.55$ ) in WOOP versus  $-0.16$  days ( $SD = 2.50$ ) in Sham WOOP,  $p = .14$ . Similarly, the difference in average drinks per drinking day at 1-month was  $-0.22$  drinks ( $SD = 1.52$ ) in WOOP versus  $-0.15$  drinks ( $SD = 1.85$ ) in Sham WOOP,  $p = .46$ , and at 2-months the difference was  $-0.33$  drinks ( $SD = 1.97$ ) in WOOP versus  $0.24$  drinks ( $SD = 2.10$ ) in Sham WOOP,  $p = .37$ . Thus, there was insufficient evidence to claim that

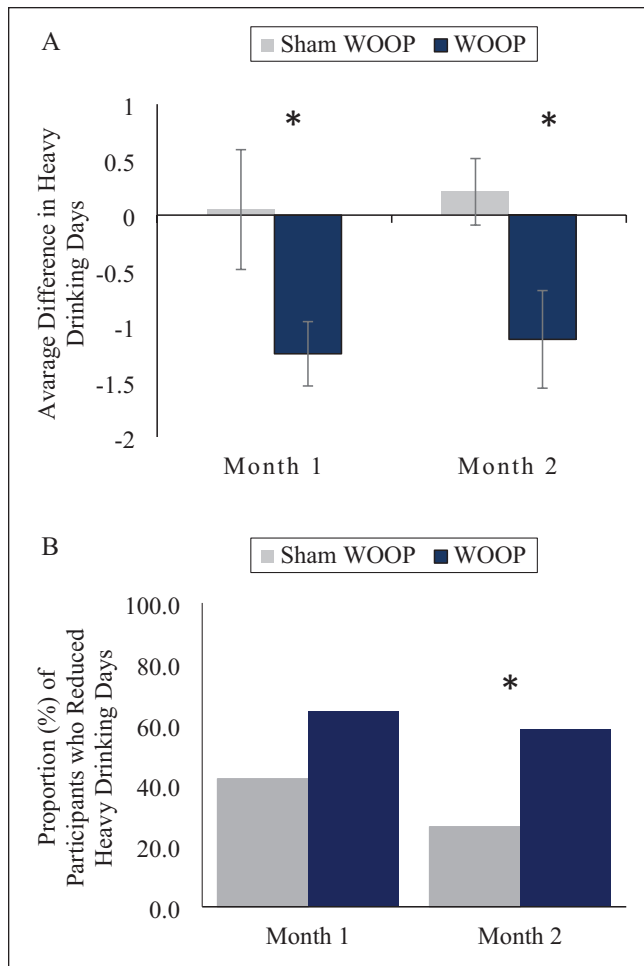
WOOP led to a greater reduction in the average number of drinking days or average number of drinks per drinking day at 1-month or 2-month follow-up compared to the Sham WOOP group.

## Feasibility Outcomes

### Adherence

Interventionists' ratings on how well the participant understood the WOOP principles and was able to use the WOOP strategy were high in both arms. On a scale of 1 to 7, mean item ratings ranged from 5.23 to 5.55 for WOOP participants, and from 4.89 to 5.00 for Sham WOOP participants. Interventionists' ratings also indicated that 89.5% of participants in the WOOP intervention and 86.4% of participants in the Sham WOOP intervention elaborated a wish pertaining to alcohol.

Participants self-reported that they used the WOOP strategy on average 2.27 times per week after one month, and 1.58 times per week after two months. Self-reported adherence was



**Figure 3.** Differences Between the WOOP and Sham WOOP Arms at the 1-Month and 2-Month Follow-up Compared to Baseline Assessment in (A) Average Difference in Heavy Drinking Days (B) Proportion of Participants With Reductions in Heavy Drinking Days.

\* $p < .05$ .

Note. Heavy drinking days were assessed via Timeline Follow-Back over the previous 14 days. Month 1:  $n = 28$  (WOOP arm) and  $n = 19$  (Sham WOOP arm); Month 2:  $n = 24$  (WOOP arm) and  $n = 19$  (Sham WOOP arm).

slightly lower in the Sham WOOP control arm, on average 1.80 and 1.43 times per week for the 1-month and 2-month follow-up, respectively.

Process measures indicated that WOOP participants completed, on average, 11 out of the 14 diaries ( $M = 10.87$ ,  $SD = 4.44$ ) and Sham WOOP participants completed 10 of the 14 diaries ( $M = 9.51$ ,  $SD = 4.85$ ). Thus, adherence to completing WOOP diaries was high and comparable in both arms.

### Acceptability

Interventionists' ratings on how open the participant was to use the WOOP strategy and how enthusiastic the participant was about using the WOOP strategy was above the midpoint of the 7-point scale in both arms. Mean item ratings ranged

from 5.00 to 5.30 for WOOP participants, and from 4.63 to 5.34 for Sham WOOP participants. Similarly, interventionists' ratings on how reluctant and rushed the participant was regarding using the WOOP strategy were below the midpoint of the 7-point scale in both arms. Mean item ratings ranged from 1.89 to 3.00 for WOOP participants, and from 1.89 to 2.57 for Sham WOOP participants (see Table 2). Participant self-reports on how much they liked to use the WOOP strategy and wanted to learn more about it was below the midpoint of the 7-point scale in both arms. Mean item ratings ranged from 3.83 to 3.08 for WOOP participants and from 3.41 to 2.89 for Sham WOOP participants. Content analyses revealed that, as measured over the previous two months, in the WOOP arm 74.1% (20 of 27) participants described positive changes regarding alcohol consumption compared to 41.7% (10 of 24) in the Sham WOOP arm, which was statistically different,  $\chi^2(1, N = 51) = 5.51, p = .019$ . When asked to describe changes in general life, in the WOOP arm 66.7% (18 of 27) participants described positive changes compared to 37.5% (9 of 24) in the Sham WOOP arm, which was also statistically different,  $\chi^2(1, N = 51) = 4.34, p = .037$ .

### Discussion

This study demonstrates the feasibility of WOOP as a brief student-delivered behavior change intervention to reduce heavy drinking within a college setting. On average, two of three WOOP participants reported having reduced their heavy drinking over two months, compared to one of five Sham WOOP participants. Further, interventionist ratings of the in-person WOOP session (e.g., How well did the participant understand how to use WOOP?) indicate that participants adhered well to the intervention. In addition, completion rates of the online WOOP diaries were also high (on average 11 out of 14 daily diaries). Despite rating acceptability (e.g., how much do you like using WOOP) below the midpoint of the scale, participants reported to continue using WOOP on average 1 to 2 times per week two months after the intervention. In addition, the content analysis of participants' open-ended answers suggests that approximately two of three WOOP participants experienced positive changes regarding their alcohol consumption compared to one of two Sham WOOP participants. Thus, our study provides evidence for the feasibility of WOOP to reduce heavy drinking in college settings.

Our study adds to the evidence that lay personnel can effectively deliver alcohol interventions. Alcohol interventions are often delivered by clinical personnel rather than lay interventionists; only 4% (2 of 52) of brief alcohol interventions have been delivered by lay interventionists such as peers according to a systematic review (Platt et al., 2016). Student-led interventions to reduce heavy drinking could be a viable option to improve treatment uptake by creating safe spaces to address drinking behaviors in young adults (Academy Health Translation and Dissemination Institute, 2018). A student's

**Table 2.** Feasibility Measures.

Adherence	Scale	WOOP	Sham control
		M (SD)	M (SD)
<b>Interventionist Rating of In-Person Session</b>			
How good was the participant's ability to use WOOP?	1–7	5.23 (1.46)	4.89 (1.76)
Did the participant get the principles of WOOP?	1–7	5.55 (1.45)	5.00 (1.50)
How well did the participant understand the procedure?	1–7	5.43 (1.38)	4.91 (1.65)
<b>Participant Self-Report at Follow-up</b>			
How many times per week did you use WOOP? (1-Month Follow-up)	open	2.27 (1.56)	1.80 (1.45)
How many times per week did you use WOOP? (2-Month Follow-up)	open	1.58 (1.64)	1.43 (1.30)
<b>Acceptability</b>			
<b>Interventionist Rating of In-Person Session</b>			
How open was the participant?	1–7	5.30 (1.21)	5.34 (1.47)
How much was the participant into it?	1–7	5.00 (1.20)	4.63 (1.40)
How rushed was the participant?	1–7	3.00 (1.86)	2.57 (1.65)
How reluctant were they to make a WOOP for alcohol?	1–7	1.89 (1.66)	1.89 (1.64)
<b>Participant Self-Report at Follow-up</b>			
How much do you like to use WOOP?	1–7	3.13 (1.48)	3.07 (1.75)
Would you like to learn more about WOOP to get a better understanding of the exercise?	1–7	3.08 (1.84)	2.89 (1.87)
Would you like to learn more strategies such as WOOP?	1–7	3.75 (1.78)	3.41 (1.91)

Note. Scales reached from *Not at all* (1) to *Very* (7). There were no significant differences between study arms, Mann–Whitney U tests,  $p_s > .08$ . WOOP = wish, outcome, obstacle, plan.

ability to confront their drinking behaviors might occur more naturally in a comfortable setting along with someone they see as more similar and relatable and less likely to judge them compared to clinical personnel. In fact, there is a growing body of evidence to support the benefits of peer involvement in health interventions (Ramchand et al., 2017; Webel et al., 2010). People who have had similar experiences and benefited from similar interventions (see CDC guidance to ambassador outreach, for instance (Centers for Disease Control and Prevention, 2013)). The present findings suggest that student-led interventions can be a promising model with advantages including lower overall costs due to minimal training requirements and students volunteering during the academic year (Abadi et al., 2020; Eaton et al., 2018).

A limitation of this study is that participants were not screened for hazardous drinking. Despite this problem, we decided against prescreening because college drinking is highly prevalent, and the stigma associated with being screened for alcohol addiction may have discouraged participants from enrolling. Another important limitation is that we did not impute missing values due to the small sample size ( $n = 86$ ) and the proportion of missing data (34.5% of participants were lost to follow-up) (DiClemente et al., 2017; Monahan et al., 2013). Although we cannot rule out that participants may have been more likely to drop out if they had not reduced their drinking, this unlikely impacted our results because (1) we report differences in heavy drinking days rather than group means and (2) attrition rates did not differ significantly by group assignment. For future studies, it will be important to replicate these findings in a larger sample and

implement robust retention strategies, such as text reminders, to limit attrition rates.

An important strength of the present study is the use of a format-matched Sham intervention control group. Previous research on brief alcohol interventions has been limited to assessment-only control groups, which cannot exclude the potential influence of social desirability bias on observed effects on self-reported drinking (Das et al., 2016). Here, we found that participants who received the Sham WOOP intervention reported similar levels of adherence and acceptability as those who received the WOOP intervention. Thus, our findings regarding differences in heavy drinking are unlikely due to social desirability. Another strength of this research is the variety of acceptability and feasibility measures using multiple sources, which included the interventionists' and participants' ratings, and independent and blinded raters performing content analysis.

In conclusion, WOOP was feasible as a novel, brief intervention to reduce heavy drinking in college settings. WOOP is a self-regulation strategy that instills the motivation to change by facilitating the courage to identify and tackle the obstacle in the way. Advantages of WOOP include that a lay person can teach people to go through the four steps of WOOP on their own. People then can set and strive for their most important wishes or goals. Because WOOP does not require ongoing interaction with a trained interventionist, it is scalable, cost-effective, and suitable for young adults who prefer self-reliance (Berridge et al., 2018; Radez et al., 2021). Thus, WOOP could be a valuable tool to address heavy drinking in young adults, and future research should establish the efficacy of WOOP for long-term drinking reduction.



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## References

- Abadi, M. H., Shamblen, S. R., Thompson, K. T., Richard, B. O., Parrino, H., & Hall, M. T. (2020). Peer-led training to reduce alcohol misuse and related harm among Greek-affiliated students. *Substance Use & Misuse, 55*, 2321–2331.
- Academy Health Translation and Dissemination Institute. (2018). *Rapid evidence review: What interventions help teens and young adults prevent and manage behavioral health challenges?* [https://academyhealth.org/sites/default/files/Rapid\\_Evidence\\_Review\\_Behavioral\\_HealthJan2018.pdf](https://academyhealth.org/sites/default/files/Rapid_Evidence_Review_Behavioral_HealthJan2018.pdf)
- Babor, T. F., Biddle-Higgins, J. C., Saunders, J. B., & Monteiro, M. G. (2001). *AUDIT: The Alcohol Use Disorders Identification Test: Guidelines for use in primary health care*. World Health Organization.
- Berridge, B. J., McCann, T. V., Cheetham, A., & Lubman, D. I. (2018). Perceived barriers and enablers of help-seeking for substance use problems during adolescence. *Health Promotion Practice, 19*, 86–93.
- Centers for Disease Control and Prevention. (2013). *Spread the word: Marketing self-management education through ambassador outreach*. U.S. Department of Health and Human Services. <https://www.cdc.gov/arthritis/marketing-support/ambassador-outreach/docs/pdf/ambassador-guide.pdf>
- Centers for Disease Control and Prevention. (2022). *Alcohol use and your health*. <https://www.cdc.gov/alcohol/fact-sheets/alcohol-use.htm>
- Curry, S. J., Krist, A. H., Owens, D. K., Barry, M. J., Caughey, A. B., Davidson, K. W., Doubeni, C. A., Epling, J. W., Jr., Kemper, A. R., Kubik, M., Landefeld, C. S., Mangione, C. M., Silverstein, M., Simon, M. A., Tseng, C.-W., & Wong, J. B., & U.S. Preventive Services Task Force. (2018). Screening and behavioral counseling interventions to reduce unhealthy alcohol use in adolescents and adults: U.S. Preventive Services Task Force recommendation statement. *Journal of the American Medical Association, 320*, 1899–1909.
- Das, J. K., Salam, R. A., Arshad, A., Finkelstein, Y., & Bhutta, Z. A. (2016). Interventions for adolescent substance abuse: An overview of systematic reviews. *Journal of Adolescent Health, 59*, S61–S75.
- DiClemente, C. C., Corno, C. M., Graydon, M. M., Wiprovnick, A. E., & Knoblach, D. J. (2017). Motivational interviewing, enhancement, and brief interventions over the last decade: A review of reviews of efficacy and effectiveness. *Psychology of Addictive Behaviors, 31*, 862–887.
- Duckworth, A. L., Kirby, T., Gollwitzer, A., & Oettingen, G. (2013). From fantasy to action: Mental Contrasting with Implementation Intentions (MCII) improves academic performance in children. *Social Psychological and Personality Science, 4*, 745–753.
- Eaton, E. M., Magill, M., Capone, C., Cramer, M. A., Mastroleo, N. R., Reavy, R., & Borsari, B. (2018). Mechanisms of behavior change within peer-implemented alcohol interventions. *Journal of Studies on Alcohol and Drugs, 79*, 208–216.
- Gollwitzer, P. M. (1999). Implementation intentions: Strong effects of simple plans. *American Psychologist, 54*, 493–503.
- Gollwitzer, P. M. (2012). Mindset theory of action phases. In P. A. M. Van Lange, A. W. Kruglanski, & E. T. Higgins (Eds.), *Handbook of theories of social psychology* (pp. 526–545). SAGE.
- Gollwitzer, P. M. (2014). Weakness of the will: Is a quick fix possible? *Motivation and Emotion, 38*, 305–322.
- Kanny, D., Naimi, T. S., Liu, Y., Lu, H., & Brewer, R. D. (2018). Annual total binge drinks consumed by U.S. adults, 2015. *American Journal of Preventive Medicine, 54*, 486–496.
- Kappes, A., & Oettingen, G. (2014). The emergence of goal pursuit: Mental contrasting connects future and reality. *Journal of Experimental Social Psychology, 54*, 25–39.
- Kappes, A., Singmann, H., & Oettingen, G. (2012). Mental contrasting instigates goal pursuit by linking obstacles of reality with instrumental behavior. *Journal of Experimental Social Psychology, 48*, 811–818.
- Marquardt, M. K., Oettingen, G., Gollwitzer, P. M., Sheeran, P., & Liepert, J. (2017). Mental Contrasting with Implementation Intentions (MCII) improves physical activity and weight loss among stroke survivors over one year. *Rehabilitation Psychology, 62*, 580–590.
- Mekonen, T., Chan, G. C. K., Connor, J., Hall, W., Hides, L., & Leung, J. (2021). Treatment rates for alcohol use disorders: A systematic review and meta-analysis. *Addiction, 116*, 2617–2634.
- Monahan, C. J., McDevitt-Murphy, M. E., Dennhardt, A. A., Skidmore, J. R., Martens, M. P., & Murphy, J. G. (2013). The impact of elevated posttraumatic stress on the efficacy of brief alcohol interventions for heavy drinking college students. *Addictive Behaviors, 38*, 1719–1725.
- National Institute on Alcohol Abuse and Alcoholism. (2023). *Alcohol's effects on health*. <https://www.niaaa.nih.gov/publications/brochures-and-fact-sheets/college-drinking>
- Oettingen, G. (2012). Future thought and behaviour change. *European Review of Social Psychology, 23*, 1–63.
- Oettingen, G., & Gollwitzer, P. M. (2018). Health behavior change by self-regulation of goal pursuit: Mental contrasting with implementation intentions. In D. de Ridder, M. Adriaanse, & K. Fujita (Eds.), *The Routledge international handbook of self-control in health and well-being* (pp. 418–430). Routledge, Taylor & Francis Group.

- Oettingen, G., & Gollwitzer, P. M. (2019). From feeling good to doing good. In J. Gruber (Ed.), *The Oxford handbook of positive emotion and psychopathology* (pp. 596–611). Oxford University Press.
- Oettingen, G., Pak, H.-J., & Schnetter, K. (2001). Self-regulation of goal-setting: Turning free fantasies about the future into binding goals. *Journal of Personality and Social Psychology, 80*, 736–753.
- Pedersen, E. R., Grow, J., Duncan, S., Neighbors, C., & Larimer, M. E. (2012). Concurrent validity of an online version of the Timeline Followback assessment. *Psychology of Addictive Behaviors, 26*, 672–677.
- Platt, L., Melendez-Torres, G. J., O'Donnell, A., Bradley, J., Newbury-Birch, D., Kaner, E., & Ashton, C. (2016). How effective are brief interventions in reducing alcohol consumption: Do the setting, practitioner group and content matter? Findings from a systematic review and meta-regression analysis. *British Medical Journal Open, 6*, Article e011473.
- Prosser, T., Gee, K. A., & Jones, F. (2018). A meta-analysis of effectiveness of e-interventions to reduce alcohol consumption in college and university students. *Journal of American College Health, 66*, 292–301.
- Radez, J., Reardon, T., Creswell, C., Lawrence, P. J., Evdoka-Burton, G., & Waite, P. (2021). Why do children and adolescents (not) seek and access professional help for their mental health problems? A systematic review of quantitative and qualitative studies. *European Child & Adolescent Psychiatry, 30*, 183–211.
- Ramchand, R., Ahluwalia, S. C., Xenakis, L., Apaydin, E., Raen, L., & Grimm, G. (2017). A systematic review of peer-supported interventions for health promotion and disease prevention. *Preventive Medicine, 101*, 156–170.
- Rollnick, S., Heather, N., Gold, R., & Hall, W. (1992). Development of a short "readiness to change" questionnaire for use in brief, opportunistic interventions among excessive drinkers. *British Journal of Addiction, 87*, 743–754.
- Substance Abuse and Mental Health Services Administration, & Center for Behavioral Statistics and Quality. (2019). *National survey on drug use and health. Table 6.21B: Types of illicit drug, tobacco product, and alcohol use in past month among persons aged 18 to 22, by college enrollment status and gender: Percentages, 2018 and 2019*. <https://www.samhsa.gov/data/sites/default/files/reports/rpt29394/NSDUHDetailedTabs2019/NSDUHDetTabsSect6pe2019.htm#tab6-21b>
- Sobell, L. C., & Sobell, M. B. (1992). Timeline follow-back. In R. Z. Litten & J. P. Allen (Eds.), *Measuring alcohol consumption: Psychosocial and biochemical methods* (pp. 41–72). Humana Press.
- Stadler, G., Oettingen, G., & Gollwitzer, P. M. (2009). Physical activity in women: Effects of a self-regulation intervention. *American Journal of Preventive Medicine, 36*, 29–34.
- Stadler, G., Oettingen, G., & Gollwitzer, P. M. (2010). Intervention effects of information and self-regulation on eating fruits and vegetables over two years. *Health Psychology, 29*, 274–283.
- Urbaniak, G. C., & Plous, S. (2013). *Research Randomizer* (Version 4.0) [Computer software]. Retrieved June 22, 2013, from <http://www.randomizer.org/>
- Webel, A. R., Okonsky, J., Trompeta, J., & Holzemer, W. L. (2010). A systematic review of the effectiveness of peer-based interventions on health-related behaviors in adults. *American Journal of Public Health, 100*, 247–253.
- Wittleder, S., Kappes, A., Krott, N. R., Jay, M., & Oettingen, G. (2020). Mental contrasting spurs energy by changing implicit evaluations of obstacles. *Motivation Science, 6*, 133–155.
- Wittleder, S., Kappes, A., Oettingen, G., Gollwitzer, P. M., Jay, M., & Morgenstern, J. (2019). Mental contrasting with implementation intentions reduces drinking when drinking is hazardous: An online self-regulation intervention. *Health Education & Behavior, 46*, 666–676.