



**QUEEN'S  
UNIVERSITY  
BELFAST**

## **Don't drink and drive, it's a prime: Cognitive effects of priming alcohol-congruent and incongruent goals among heavy versus light drinkers**

Petzel, Z., & Noel, J. G. (2020). Don't drink and drive, it's a prime: Cognitive effects of priming alcohol-congruent and incongruent goals among heavy versus light drinkers. *Journal of Health Psychology*.  
<https://doi.org/10.1177/1359105320934166>

**Published in:**  
Journal of Health Psychology

**Document Version:**  
Peer reviewed version

**Queen's University Belfast - Research Portal:**  
[Link to publication record in Queen's University Belfast Research Portal](#)

**Publisher rights**  
Copyright 2020 The Authors. This work is made available online in accordance with the publisher's policies. Please refer to any applicable terms of use of the publisher.

**General rights**  
Copyright for the publications made accessible via the Queen's University Belfast Research Portal is retained by the author(s) and / or other copyright owners and it is a condition of accessing these publications that users recognise and abide by the legal requirements associated with these rights.

**Take down policy**  
The Research Portal is Queen's institutional repository that provides access to Queen's research output. Every effort has been made to ensure that content in the Research Portal does not infringe any person's rights, or applicable UK laws. If you discover content in the Research Portal that you believe breaches copyright or violates any law, please contact [openaccess@qub.ac.uk](mailto:openaccess@qub.ac.uk).

Don't Drink and Drive, It's a Prime: Cognitive Effects of Priming Alcohol-Congruent and  
Incongruent Goals Among Heavy versus Light Drinkers

Zachary W. Petzel<sup>1</sup> and Jeffrey G. Noel<sup>2</sup>

<sup>1</sup>Queen's University Belfast, <sup>2</sup>University of Missouri – St. Louis

Author Note

Zachary W. Petzel, PhD, School of Psychology, Queen's University Belfast; Jeffrey G. Noel, PhD, Missouri Institute of Mental Health, University of Missouri-St. Louis

Support for this research was provided by a University of Missouri System-Research Board Award to Jeffrey G. Noel. We thank the undergraduate research assistants in UMSL's Social Cognition and Alcohol Studies Lab for conducting the experimental sessions, Tracy Mulderig, Mandy Nelson and Debra O'Neill for lab and data management, and the college students who participated.

Correspondence regarding this article should be addressed to Zachary W. Petzel, School of Psychology, Queen's University Belfast, 18-30 Malone Rd, Belfast, BT9 5BN, UK. E-mail: z.petzel@qub.ac.uk

### Abstract

The present experiment assessed implicit alcohol motivations and explicit alcohol expectancies following the interaction between alcohol-congruent (i.e., social drinking) versus incongruent (i.e., driving safety) goal primes and recent drinking habits among college students ( $N = 176$ ). Heavy drinkers exhibited greater implicit alcohol approach and explicit tension reduction expectancies following social goal primes, while displaying greater implicit alcohol avoidance and explicit cognitive and behavioral impairment expectancies after driving safety goal primes. These findings indicate recent drinking habits interact with goal salience to influence explicit and implicit responses to alcohol, which has implications for the development of interventions to reduce college drinking.

*Keywords:* Alcohol, Implicit attitudes, Alcohol expectancies, Goal priming, Drinking behavior,

College students

Don't Drink and Drive, It's a Prime: Cognitive Effects of Priming Alcohol-Congruent and  
Incongruent Goals Among Heavy versus Light Drinkers

Half of college students in the United States engage in heavy episodic drinking (HED), drinking 4 or more drinks for females or 5 or more drinks for males in one sitting (White and Hingson, 2013). Many researchers seek to develop interventions that reduce students' HED by influencing cognitive and motivational precursors to high-risk alcohol use (Houben, Havermans, and Wiers, 2010; Noel, Petzel, and Mulderig, 2019). A long-standing intervention target has been self-reported alcohol expectancies, anticipatory assessments of positive and negative outcomes related to alcohol use. Expectancies predict drinking behavior among college students (Hasking, Lyvers, and Carlopio, 2011), however, interventions which challenge explicit alcohol expectancies (e.g., demonstrating rewarding effects of drinking may also be experienced after a placebo; Lau-Barraco and Dunn, 2008) may not be effective in reducing long-term alcohol consumption (Scott-Sheldon, Terry, Carey, Garey, and Carey, 2012). Dual-process models of cognition have given rise to alternative approaches for measuring anticipated positive and negative drinking outcomes, such as through behavioral tasks like the Implicit Association Test (IAT) which predict unique variance in drinking behavior (Reich, Below, and Goldman, 2010). Interventions and manipulations targeting automatic or implicit cognitions, like those assessed in the IAT, may enhance interventions to promote health behaviors (Papies, 2016; Cristea, Kok, and Cuijpers, 2016).

Health behaviors linked to habit formation (e.g., alcohol use) may be particularly resistant to change via manipulations targeting only self-reported or explicit cognitions such as expectancies (Papies, 2016). An understudied manipulation which targets both explicit and implicit cognitions and may be useful in reducing HED among college students is goal priming.

After a goal is activated, cognitions shift to align with goal-related behaviors to facilitate change (Ferguson and Porter, 2010). For example, completing a sentence unscrambling task or questionnaire referencing socializing goals promotes greater social-related cognitions (Ferguson, 2008), suggesting exposure to goal-related primes may impact subsequent behavior. Whereas goal priming facilitates attitude change toward non-alcohol targets (Ferguson and Porter, 2010), little research has examined how priming alcohol-related goals may influence attitudes toward alcohol (Sheeran et al., 2005; Webb, Sheeran, Gollwitzer, and Trötschel, 2012).

While a variety of manipulations are established to influence attitudes towards health behaviors (e.g., alcohol use; Lau-Barraco and Dunn, 2008; Noel et al., 2019), certain factors may reduce or promote their effectiveness. Regarding alcohol, previously learned associations and situational contexts may contribute to the effectiveness of college drinking interventions (Ham, Zamboanga, Bridges, Casner, and Bacon, 2012; Noel et al., 2019). For example, while many college students learn to associate drinking with negative outcomes, heavy drinkers discount these consequences relative to the rewards associated with alcohol (Wiers, van de Luitgaarden, van den Wildenberg, and Smulders, 2005). Therefore, heavy drinkers exhibit stronger baseline alcohol-approach tendencies and associations compared to light drinkers (Field, Kiernan, Eastwood, and Child, 2008), suggesting interventions aiming to reduce college drinking may lead to more measurable change when targeted towards those engaging in HED. Further, college students exhibit more *negative* alcohol cognitions and associations in negative compared to positive (e.g., social) contexts (Ham et al., 2013), indicating a path toward reducing pro-alcohol cognitive bias. That is, college drinking interventions may benefit from making negative alcohol-related associations and contexts salient among heavy drinkers, who would typically discount these negative associations.

Goal priming may be useful in activating these negative associations to reduce HED among heavy drinkers. Activation of alcohol-congruent goals (e.g., socializing) promotes positive alcohol-related cognitions (Sheeran et al., 2005; Webb et al., 2012). However, relevant to potential drinking and health interventions, whether an alcohol-incongruent goal linked to negative alcohol-related outcomes and contexts (e.g., driving under the influence) activates negative alcohol cognitions is unclear. Thus, we aimed to inform potential drinking interventions through a preliminary investigation of how activating alcohol-congruent (e.g., socializing) versus alcohol-incongruent (e.g., driving safety) goals influence implicit alcohol motivations and explicit alcohol expectancies between heavy versus light college drinkers. We expected priming social drinking goals would promote positive alcohol cognitions, whereas priming driving safety goals would elicit negative alcohol cognitions. However, we expected goal activation would be most effective among heavy drinkers.

## Method

### Participants

Undergraduate students ( $N = 176$ ; 71.5% female;  $M_{\text{age}} = 23.81$ ,  $SD_{\text{age}} = 7.59$ ) at a Midwestern University were recruited to participate in an experimental research paradigm, receiving course credit for their participation. All participants reported drinking alcohol within the past 30 days and identified as White/Caucasian (56%), Black/African American (28.6%), Latino/a (6.3%), or as another race (9.1%). Only 10.8% ( $n = 19$ ) reported belonging to a fraternity or sorority. A sensitivity power analysis indicated 80% power to detect an approximately small to medium effect size ( $\eta^2 = .04$ ).

## Measures and Procedure

After providing informed consent, participants self-reported demographics, as well as lifetime and recent drinking behavior. Next, they were randomly assigned to goal priming conditions (social drinking, driving safety). After completing the priming task, participants completed measures of implicit alcohol motivation and explicit alcohol expectancies, with order of implicit and explicit measures counterbalanced between subjects.

**Alcohol use and experiences questionnaire.** Alcohol use was assessed using items adapted from the National Institute on Alcohol Abuse and Alcoholism (NIAAA) Task Force on Recommended Alcohol Questions (NIAAA, 2003; Bartholow et al., 2018). Participants were provided standard drink definitions (e.g., 12-ounce can) and asked 12 questions regarding alcohol use within various time intervals (e.g., 30 days, 3 months, lifetime) including reporting average number of drinking occasions (closed response; e.g., once a month, 2 to 3 times a month), average number of drinks consumed per occasion (free response), and maximum numbers of drinks recently consumed (free response).

**Goal priming task.** Participants completed a questionnaire which focused on socializing or driving safety (see supplementary materials). In the social priming condition participants were asked to answer 14 questions rating the frequency with which they engaged in various activities with friends and/or family (e.g., going to concerts, going to happy hour), as well as 2 open-ended questions about the importance of friends and how common it is for adults to drink while socializing. Those assigned to driving safety answered 14 questions about how frequently they engage in safe driving behaviors (e.g., limiting distractions, using turn signals), as well as 2 open-ended questions about the importance of safe driving habits and how common it is for adults to drink alcohol and then drive an automobile. Social priming questions were adapted

from Ferguson (2008), while additional items linked to alcohol and driving safety were created using similar methodologies to previous goal priming work (e.g., Sheeran et al., 2005).

**Implicit alcohol motivation.** The alcohol motivation IAT was modeled after Palfai and Ostafin (2003). Participants sorted pictures (i.e., soft drinks or alcoholic beverages) and words (i.e., approach-related or avoidance-related). In one set of critical trials, participants were instructed to sort alcohol images with avoidance-related words and soft drinks with approach-related words. In another set of critical trials, these pairings were switched. Order of critical trial blocks was counterbalanced. Reaction time-based D scores were calculated with positive scores indicating stronger alcohol-avoidance associations and negative scores suggesting stronger alcohol-approach associations (see Greenwald, Nosek, and Banaji, 2003).

**Explicit alcohol expectations.** The comprehensive effects of alcohol (CEOA; Fromme, Stroot, and Kaplan, 1993) assesses anticipation of positive and negative drinking outcomes and consists of 38 items that make up 4 positive subscales (sociability, tension reduction, liquid courage, sexuality) and 3 negative subscales (cognitive/behavioral, risk/aggression, self-perception). Participants reported the likelihood they would experience the outcome described when drinking alcohol from 1 (*Disagree*) to 4 (*Agree*). Participants also reported the valence (positive or negative) of that outcome from 1 (*Bad*) to 5 (*Good*).

**Ethical Approval.** All measures and procedures were approved by the University's institutional review board.

**Data Analysis.** Participants were classified as engaging in HED if they indicated consuming 5 or more (for males) or 4 or more (for females) alcoholic drinks on at least one occasion within the past 30 days (Hingson et al., 2009). Using these criteria, 48.3% of the recruited sample were classified as engaging in recent HED. Implicit alcohol motivation was

analyzed using a 2 (goal activation: social, safety) X 2 (drinker status: non-HED, HED) factorial analysis of variance (ANOVA), with subsequent univariate ANOVAs used to probe significant interactions. Explicit alcohol expectancies were analyzed using a 2 (goal activation) X 2 (drinker status) multivariate ANOVA, performed separately on valence and expectancy estimates of the 7 subscales of the CEOA. Subsequent factorial ANOVAs were used on individual estimates, with univariate ANOVAs used to probe significant interactions.

### Results

**Implicit alcohol motivation.** No significant main effect of goal activation on alcohol motivation emerged,  $F(1,172) = 1.04, p = .309, \eta_p^2 = .006$ . However, a main effect of drinker status emerged,  $F(1,172) = 11.65, p = .001, \eta_p^2 = .063$ , indicating HEDs demonstrated less alcohol avoidance ( $M = 0.09, SD = 0.50$ ) compared to non-HEDs ( $M = 0.23, SD = 0.51$ ). The interaction between goal activation and drinker status was significant,  $F(1,172) = 6.23, p = .014, \eta_p^2 = .035$ . Among non-HEDs, there were no differences in alcohol motivations between social ( $n = 47$ ) versus safety ( $n = 44$ ) conditions,  $F(1,172) = 1.13, p = .290, \eta_p^2 = .007$ . However, HEDs primed with social goals exhibited greater implicit alcohol approach ( $n = 45; M = -0.03, SD = 0.48$ ) compared to safety goals ( $n = 40; M = 0.23, SD = 0.49$ ), suggesting safety primes promoted alcohol avoidance in heavier drinkers,  $F(1,172) = 5.97, p = .016, \eta_p^2 = .034$  (see Figure 1).

INSERT FIGURE 1 HERE

**Explicit alcohol expectancies.** No main effects emerged for valence or expectancy estimates, all  $ps > .220$ . The interaction between factors significantly affected expectancy, Wilks'  $\lambda = .907, F(7,166) = 2.42, p = .022, \eta_p^2 = .093$ , but not valence estimates,  $p = .089$ . Significant interactions emerged between goal activation and drinker status for cognitive/behavioral impairment,  $F(1,172) = 5.92, p = .016, \eta_p^2 = .036$  and tension reduction,  $F(1,172) = 7.51, p =$

.007,  $\eta_p^2 = .042$ . HEDs in the driving safety condition reported significantly higher impairment expectations ( $M = 3.08$ ,  $SD = 0.36$ ) compared to the social condition ( $M = 2.81$ ,  $SD = 0.60$ ),  $F(1,172) = 4.80$ ,  $p = .030$ ,  $\eta_p^2 = .027$ . Conversely, HEDs reported greater tension reduction expectations in the social ( $M = 2.90$ ,  $SD = 0.61$ ) compared to the safety condition, ( $M = 2.60$ ,  $SD = 0.67$ ),  $F(1,172) = 4.02$ ,  $p = .047$ ,  $\eta_p^2 = .023$ . No differences in expectancy estimates emerged between goal activation conditions among non-HED participants, both  $ps > .220$ .<sup>1</sup>

### Discussion

The current experiment extends the literature by examining how goal activation may not only increase, but also reduce, motivations and cognitions that predict college HED. Heavy drinkers primed with alcohol-congruent goals exhibited greater implicit alcohol approach and tension reduction expectancies compared to light drinkers. Conversely, heavy drinkers primed with alcohol-incongruent goals exhibited implicit alcohol avoidance, suggesting driving safety goals may activate negative alcohol-related associations. Supporting this assumption, heavy drinkers reported greater cognitive/behavioral impairment expectancies after driving safety primes. While these findings replicate past research suggesting social primes promote positive alcohol attitudes (Sheeran et al., 2005; Webb et al., 2012), our results extend the literature by demonstrating how priming negative alcohol-related contexts may reduce pro-alcohol biases, particularly among heavy drinkers. Importantly, goal priming was effective on explicit and implicit measures, which each predict unique variance in health behaviors and likely capture separate, but weakly related, constructs (Reich et al., 2010).

While our manipulation was adapted from previous research, we did not assess or pilot whether manipulations facilitated goal-state activation (e.g., immediate desire for socializing or safety). Thus, further research is needed to clearly delineate the precise mechanism underlying

our findings. However, our results are in line with hypotheses and our methodology is consistent with research which has successfully facilitated goal-state activation (Ferguson, 2008, Sheeran et al., 2005; Webb et al., 2012). While we did not include follow-up assessment of drinking behavior, implicit alcohol motivations are known to predict future alcohol use (Farris, Ostafin, and Palfai, 2010). While we expected social primes to impact a variety of positive expectancies, the lack of a priming effect on the social subscale of the CEOA was not anticipated. However, students in the present study—reflecting demographics on our urban, commuter campus—were older than participants in typical studies of college drinking, and therefore may hold different expectancies for social contexts. Further, the sample largely consisted of female participants. While college men and women may differ in patterns of alcohol use (Hoeppe, Paskausky, Jackson, and Barnett, 2013), our findings suggest goal priming among heavy drinkers may be effective regardless of sex. However, future studies should examine how manipulations which target health cognitions, such as goal activation, differ across varying demographic subgroups.

Notwithstanding the limitations of the study, our findings are in line with studies reporting goal priming can alter both implicit and explicit attitudes (Ferguson and Porter, 2010; Fitzsimons and Shah, 2008). These findings integrate within the broader literature concerning how goal priming may influence health behaviors. While previous work has examined how social goal primes may promote pro-alcohol cognitions and behavior (Sheeran et al., 2005; Webb et al., 2012), to our knowledge, this is the first published study to examine how priming driving safety goals may promote alcohol avoidance among heavy versus light drinkers. Further, while recent research has failed to replicate the effects of goal priming on cognitions and behavior (Harris, Coburn, Rohrer, and Pashler, 2013), our findings suggest individual differences (e.g., recent drinking history) may play a role in the effectiveness of goal priming. Consistent with

Harris et al. (2013), we found no main effect differences between priming conditions. However, differences between prime conditions did emerge among heavy drinkers, suggesting goal priming may only be effective in changing alcohol-related cognitions among those reporting recent HED. Thus, our findings suggest the inclusion of individual and contextual factors that may moderate responses towards health-related behaviors following goal activation.

While these results have potential to contribute to the development of novel drinking interventions among heavy drinkers, additional work is needed to translate our findings into real-world contexts. For example, restaurants and grocery stores displaying health-related primes (e.g., advertisements, menus) seemingly promote healthier decision-making compared to when these primes are not present (Papies and Hamstra, 2010; Stöckli, Stämpfli, Messner, and Brunner, 2016). Thus, future research may implement alcohol-incongruent primes in environments where HED may occur, examining their impact on alcohol use among heavy drinkers. Further, we did not capture the variety of alcohol-related goals in our manipulation. For example, future studies might examine the impact of priming alternative alcohol-related consequences (e.g., physical health, risk-taking). Additional research using our paradigm and other approaches to goal-priming (e.g., widening the range of goals), in addition to testing interactions between immediate goals and individual differences (e.g., recent drinking habits), may inform interventions to reduce college drinking.

## Footnotes

1. Due to the overrepresentation of females, additional analyses were conducted with sex (male, female) as a factor. However, no factors significantly interacted with sex for implicit alcohol motivation, all  $ps > .195$ , or explicit alcohol expectancies, all  $ps > .233$ .

## References

- Bartholow, B. D., Fleming, K. A., Wood, P. K., Cowan, N., Saults, J. S., Altamirano, L., ... and Sher, K. J. (2018) Alcohol effects on response inhibition: Variability across tasks and individuals. *Experimental and Clinical Psychopharmacology* 26(3): 251-267.
- Cristea, I. A., Kok, R. N., and Cuijpers, P. (2016) The effectiveness of cognitive bias modification interventions for substance addictions: A meta-analysis. *PloS one* 1: 19.
- Farris, S. R., Ostafin, B. D., and Palfai, T. P. (2010) Distractibility moderates the relation between automatic alcohol motivation and drinking behavior. *Psychology of Addictive Behaviors* 24(1): 151-156.
- Ferguson, M. J. (2008) On becoming ready to pursue a goal you don't know you have: Effects of nonconscious goals on evaluative readiness. *Journal of Personality and Social Psychology* 95(6): 1268-1294.
- Ferguson, M. J. and Porter, S. C. (2010) What is implicit about goal pursuit. In B. Gawronski and K. Payne (Eds.), *Handbook of implicit social cognition: Measurement, theory, and applications* (pp. 311-331). New York, NY: Guilford Press.
- Field, M., Kiernan, A., Eastwood, B., and Child, R. (2008) Rapid approach responses to alcohol cues in heavy drinkers. *Journal of Behavior Therapy and Experimental Psychiatry* 39(3): 209-218.
- Fitzsimons, G. M., and Shah, J. Y. (2008) How goal instrumentality shapes relationship evaluations. *Journal of Personality and Social Psychology* 95(2): 319-337.

- Fromme, K., Stroot, E. A., and Kaplan, D. (1993) Comprehensive effects of alcohol: Development and psychometric assessment of a new expectancy questionnaire. *Psychological Assessment* 5(1): 19-26.
- Greenwald, A. G., Nosek, B. A., and Banaji, M. R. (2003) Understanding and using the implicit association test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology* 85(2): 197-216.
- Ham, L. S., Zamboanga, B. L., Bridges, A. J., Casner, H. G., and Bacon, A. K. (2013) Alcohol expectancies and alcohol use frequency: Does drinking context matter? *Cognitive Therapy and Research* 37(3): 620-632.
- Harris, C. R., Coburn, N., Rohrer, D., and Pashler, H. (2013). Two failures to replicate high-performance-goal priming effects. *PloS one* 8(8): e72467.
- Hasking, P., Lyvers, M., and Carlopio, C. (2011) The relationship between coping strategies, alcohol expectancies, drinking motives and drinking behaviour. *Addictive Behaviors* 36(5): 479-487.
- Hoepfner, B. B., Paskausky, A. L., Jackson, K. M., and Barnett, N. P. (2013) Sex differences in college student adherence to NIAAA drinking guidelines. *Alcoholism: Clinical and Experimental Research* 37(10): 1779-1786.
- Houben, K., Havermans, R. C., and Wiers, R. W. (2010) Learning to dislike alcohol: Conditioning negative implicit attitudes toward alcohol and its effect on drinking behavior *Psychopharmacology* 211(1): 79-86.

Lau-Barraco, C. and Dunn, M. E. (2008) Evaluation of a single-session expectancy challenge intervention to reduce alcohol use among college students. *Psychology of Addictive Behaviors* 22(2): 168-175.

National Institute on Alcohol Abuse and Alcoholism (NIAAA) Task Force on Recommended Alcohol Questions (2003) *Recommended alcohol questions*. Retrieved from <https://www.niaaa.nih.gov/research/guidelines-and-resources/recommended-alcohol-questions>

Noel, J. G., Petzel, Z. W., and Mulderig, T. H. (2019) Of two minds about alcohol: Specific effects of evaluative conditioning on implicit, but not explicit, alcohol cognitions among heavy versus light drinkers. *Psychology of Addictive Behaviors* 33(3): 285-296.

Palfai, T. P., and Ostafin, B. D. (2003) Alcohol-related motivational tendencies in hazardous drinkers: Assessing implicit response tendencies using the modified-IAT. *Behaviour Research and Therapy* 41(10): 1149-1162.

Papies, E. K. (2016) Health goal priming as a situated intervention tool: How to benefit from nonconscious motivational routes to health behaviour. *Health Psychology Review* 10(4): 408-424.

Papies, E. K. and Hamstra, P (2010) Goal priming and eating behavior: Enhancing self-regulation by environmental cues. *Health Psychology* 29(4): 384-388.

Reich, R. R., Below, M. C., and Goldman, M. S. (2010) Explicit and implicit measures of expectancy and related alcohol cognitions: A meta-analytic comparison. *Psychology of Addictive Behaviors* 24(1): 13–25.

Scott-Sheldon, L. A., Terry, D. L., Carey, K. B., Garey, L., and Carey, M. P. (2012) Efficacy of expectancy challenge interventions to reduce college student drinking: A meta-analytic review. *Psychology of Addictive Behaviors* 26(3): 393-405.

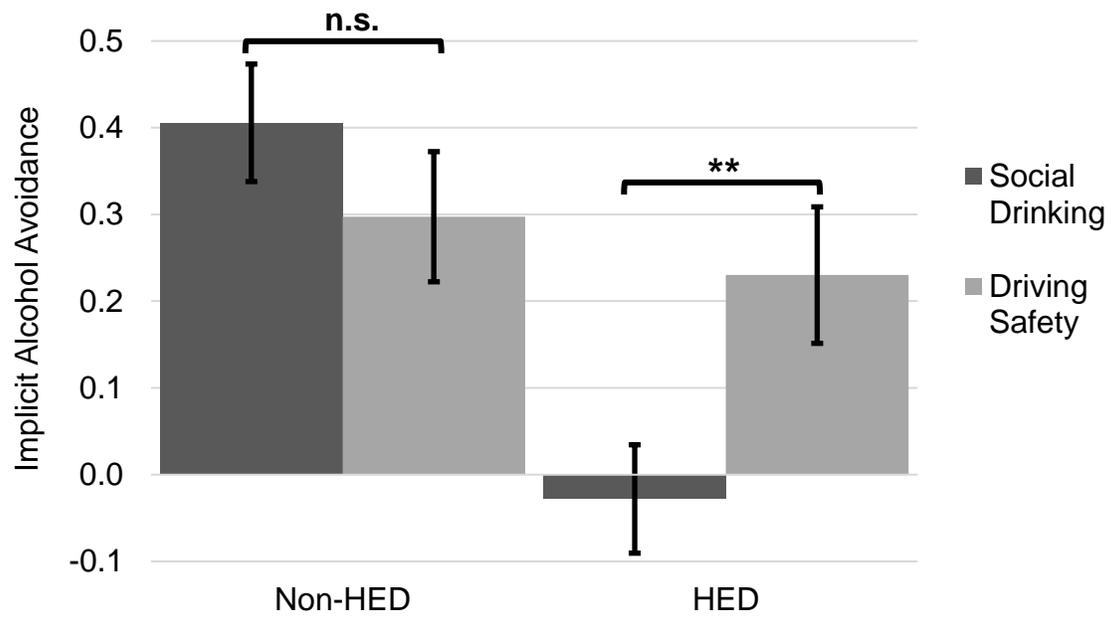
Sheeran, P., Aarts, H., Custers, R., Ravis, A., Webb, T. L., and Cooke, R. (2005) The goal-dependent automaticity of drinking habits. *British Journal of Social Psychology* 44(1): 47-63.

Stöckli, S., Stämpfli, A. E., Messner, C., & Brunner, T. A. (2016). An (un) healthy poster: When environmental cues affect consumers' food choices at vending machines. *Appetite* 96: 368-374.

Webb, T. L., Sheeran, P., Gollwitzer, P. M., and Trötschel, R. (2012) Strategic control over the unhelpful effects of primed social categories and goals. *Zeitschrift für Psychologie* 220(3): 187-193.

White, A. and Hingson, R. (2013) The burden of alcohol use: Excessive alcohol consumption and related consequences among college students. *Alcohol Research: Current Reviews* 35(2): 201-218.

Wiers, R. W., van de Luitgaarden, J., van den Wildenberg, E., and Smulders, F. T. (2005) Challenging implicit and explicit alcohol-related cognitions in young heavy drinkers. *Addiction* 100(6): 806-819.



**Figure 1.** Implicit alcohol avoidance motivation as a function of goal activation (social, safety) and drinker status (non-HED, HED). Error bars represent standard error.  $**p < .01$ , *n.s.* = non-significant