Long Title: Can We Change Automatic Processes: The Influence of Social Priming on Alcohol Attentional Bias

Short Title: Can We Change Automatic Processes?

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Declarations

Ethics Approval and Consent to Participate

This study has been approved by City, University of London Psychology Department Research Ethics Committee. Written consent was obtained from participants prior to the experiment commencing.

Consent for Publication

Not applicable.

Availability of Data and Materials

All data generated or analysed during this study are included in this published article [and its supplementary information files].

Competing Interests

The authors declare that they have no competing interests.

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Authors' Contributions

EP and EZ contributed to experimental design. SC collected and analysed the data and wrote the manuscript. EP, EZ and KT were also a major contributor in writing, reading and approving the manuscript. All authors read and approved the manuscript.

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Not Applicable.

Code Availability

All data generated or analysed during this study are included in this published article [and its supplementary information files].

Abstract

The Stroop Effect has been linked to social concept priming, suggesting that the latter may trigger automatic behaviour aligned with the primed concept. This study examined the effects of social priming on alcohol attentional bias, with a sample of mostly light drinkers; it used a social priming task and an alcohol-Stroop test to measure participants' response times (RTs) before and after they had been socially primed. Participants were separated into one of three social priming conditions: Neutral, Alcohol Addiction, and Alcohol Preoccupation. A mixed ANOVA was run to determine whether participants' RTs to alcohol-related stimuli slowed significantly after the alcohol interference tasks, relative to the neutral interference task, suggesting an alcohol attentional bias had been induced by the social priming exercise. Key interaction terms did not reveal such an interaction, but rather a general slowing down (for both neutral and alcohol stimuli), in the Alcohol conditions, relative to the Neutral one. As a result, we can conclude that while we did not induce an alcohol-specific bias in participants, we did discover a generalized interference effect, following alcohol-related social priming tasks.

Key Words

Social Priming; Stroop Task; Alcohol Attentional Bias

Introduction

Alcohol consumption remains a critical health concern in the UK, with alcohol abuse resulting in 8,974 fatalities in 2020 (Butt & John, 2021). In trying to understand and mitigate alcohol abuse, some researchers have explored the putative role that attention plays in the establishment and maintenance of alcohol abuse. Suri and Gross (2015), for example, argued that attention can be linked to subsequent decisions, for stimuli that have been attended to, regardless of the nature of the stimuli. Tiffany (1990) suggested that repeated drug usage can create a more fluent transition from attentional awareness to behavioural action. According to these accounts, initial attentional capture can serve to motivate attractive responses to alcohol-related stimuli, and subsequently motivate alcohol consumption.

These behaviours are enhanced, potentially to the point of automaticity, as consumption of alcohol and alcohol-related substances increases. Robinson and Berridge's (1993) classic idea suggests that repeated administration of an abused substance produces sensitization to the relevant stimuli, and gets progressively larger, with each new administration. This process is repeated to the extent that individuals selectively attend to specific stimuli automatically (Friese et al., 2011; Williams et al., 1988). In the context of alcohol-related stimuli, specifically, this automatic attentional response is referred to as alcohol attentional bias (M. Field & Cox, 2008).

The classic definition of automaticity is a fast, parallel process, not limited by short-term memory, using little subject effort, permitting little subject control, but requiring extensive training to develop (Schneider et al., 1982). As a result, exploring potential ways to influence or manipulate automatic behaviour may be of considerable experimental and applied interest. Goldfarb et al. (2011) employed the technique of social priming (Bargh et al., 1996; Dijksterhuis & van Knippenberg, 1998), as a way to induce changes in automatic behaviour. Even though the evidence for social priming has been controversial, Goldfarb et al. (2011) found that their manipulation could improve participants' performance on a Stroop task, by priming participants with a dyslexic social construct. Effectively, participants were presented with a short description of a dyslexic individual midway through a standard Stroop task, and were asked to write a few sentences, over a short period of time, exploring what that individual might do on a standard day.

They found that participants' word reading ability, demonstrated by improved RTs to stimuli in the Stroop task, was impeded.

Our experiment builds on Goldfarb et al.'s (2011) methodology, focusing on alcohol attentional bias. This is an important application, since it bears on whether alcohol-related social priming (e.g., from media) might inadvertently exacerbate alcohol use.

We followed all the main details of Goldfarb et al.'s (2011) methodology, with the exception of using the Alcohol Stroop task, rather than the traditional Stroop task and a social priming manipulation for alcohol-related characters. With a sample of mostly light drinkers, alcohol Stroop interference should be null at baseline. The experimental question is whether social priming with the characteristics of a person abusing alcohol might increase alcohol-Stroop interference. In this way, we hoped to acquire insight into ways to manipulate alcohol-related biases (and beyond), which might offer avenues for intervention (Cox et al., 2015).

Ultimately, we predicted that participants in the alcohol-related priming conditions (Alcohol Addiction and Alcohol Preoccupation) would exhibit a reliable slowing down of RTs to alcohol-related stimuli, post-interference task, relative to participants in the Neutral condition. This prediction takes a general expectation of response time improvement into account, as a result of practice effects.

Methods

Participants

A total of 152 participants (90 female; mean age 26.41, standard deviation 9.65) responding to posted advertisements at City, University of London and through the university's online recruitment service took part in the experiment. Our total sample slightly exceeded the a priori 150 target, due to the way bookings were made. The recruitment advertisement highlighted a preference for heavy drinkers, defined as individuals who consumed more than 14 units of alcohol, on average, per week, but our participants were primarily light drinkers, defined as

individuals who averaged less than 14 units of alcohol consumption on a weekly basis. The sample size estimate is entirely exploratory: the only prior work linking attentional processes and social priming is that of Goldfarb et al. (2011). As that study concerned the standard Stroop task and social priming related to dyslexia, there is only a tenuous link with the present work and, as a result, we opted not to use it as a guide for the present sample estimate.

Design

The experiment followed a 3 (Social Priming) X 2 (Stimulus Category) X 4 (Block) mixed design, with repeated measures on the last two variables. Participants were allocated to one of three conditions: Neutral, Alcohol Addiction, or Alcohol Preoccupation. The details of each condition are described below, under the Procedure subsection, but effectively presented participants with one of three social priming tasks, corresponding to their condition allocation. Finally, related to the stimuli themselves, participants were presented with alcohol-related or neutral words across four experimental blocks, described in the Stimuli subsection below. The dependent variable was mean RTs, calculated for correct responses.

Stimuli

The Stroop task involved 128 stimuli, with each stimulus consisting of an alcohol-related or a neutral word displayed in one of the following four colors: red, green, blue, and yellow. The eight alcohol-related words (liquor, whiskey, gin, beer, alcohol, drunk, bar, booze) used were taken from the 25 alcohol-related words used by Sharma et al. (2001). These words were matched in terms of word length and word frequency (Kucera & Francis, 1967), with eight neutral words (bridges, leaves, fog, cliff, winds, ocean, tree, meadow) taken from the 25 neutral words used by Sharma et al. (2001). The means for the two sets of words are as follows: word length: (M=5.0, SD=1.6) vs (M=5.1, SD=1.3), $t(14)=.17$, $p=.864$; word frequency: (M=33.5, SD=25.6) vs (M=30.9, SD=17.1), $t(14)=.24$, $p=.813$. The words were displayed in bold Courier New 22-point font.

The 128 words were presented sequentially on a computer screen and were grouped in four blocks of 32 words (two before and two after social priming). Each word in each block was individually displayed in every one of the four colours (i.e., eight alcohol-related words X four colours + eight neutral words X four colours). Consequently, each word appeared two times in every one of the four colours in each experimental session, resulting in 128 stimuli in each session.

Procedure

At the beginning of the experiment, participants read the Stroop task instructions, which informed them that they would be presented with a list of words printed in different colors. Their task was to press the key corresponding to the color in which each word was printed, ignoring the meaning of the word. They were also informed that there was a time limit and were thus asked to respond as quickly and accurately as possible.

The words were presented on a computer screen. Participants viewed the stimuli from a distance of approximately 60 cm. Responses were given on the right-hand numeric pad of the keyboard, using the keys for 1, 4, 2, and 3. Red, yellow, green, and blue tapes were pasted on keys “1”, “4”, “2” and “3”, respectively. Participants initially completed a series of key-matching trials to orient themselves to the key-colour correspondence. Subsequently, they were given 12 practice trials, in which colour words were shown in different colours, and were asked to identify the colour in which words were presented.

After the practice trials, participants were presented with the first two 64-trial blocks of the main Stroop trials. These trials had the same format as the practice trials, but participants were shown alcohol-related or neutral words.

At the end of the two blocks of Stroop trials, participants were told they had to take part in a separate study. Social priming was manipulated between participants, such that each participant was presented with one of three passages, matched for length, of a hypothetical person. ‘Tom’ was described as an alcoholic with several clinical symptoms of alcohol abuse (54 participants;

Appendix 1); 'Neil' as an alcohol abuser preoccupied by alcohol (50 participants; Appendix 1); and 'John' as an outdoors enthusiast, with a healthy lifestyle (48 participants; Appendix 1). After reading their assigned story, participants were asked to answer the following questions about the protagonist of the story: *In the next 5 min, think and write about John's [or Tom's, or Neil's] everyday life. What does his daily routine look like? What are the things he would typically do and the things he would not do?* This social priming task closely follows the exercise used by Goldfarb et al. (2011). After completing this task, participants were presented with two more 64 trial blocks of the main Stroop task.

Analysis

A mixed design ANOVA was run to determine whether participants' RTs differed significantly across experimental blocks, stimulus categories and social priming conditions. These three variables were included as independent variables in our analysis, including all main effects, two-way interactions, and the one three-way interaction. As described in greater detail in the Results section, the Block variable only involved two levels (blocks 1 and 4). The hypothesis that social priming impacts attentional bias would be evidenced by a significant three-way interaction, between Stimulus Category, Social Priming condition, and Block, in which RTs to alcohol-related stimuli, after exposure to alcohol-related social priming tasks, would slow down, relative to RTs for the neutral stimuli, and RTs generated after non-alcohol-related social priming tasks. Note, regarding the between participants part of the ANOVA, Levene's test indicated a homogeneity of variance violation. However, we did not act on this, because, given our fairly large sample size, the ANOVA should be robust to such violations and also, in such cases, Levene's test is known to be over-sensitive to small violations of this assumption (Field, 2009). Furthermore, robustness of ANOVA to variance heterogeneity holds with approximately equal group sizes, provided the ratio of the largest to the smallest group variance is not greater than three (Glass et al., 1972; see also Ramachandran & Tsokos 2015). Regarding the within-participants part, it is not relevant to examine the sphericity assumption, since there are only two levels.

Results

Individual average RTs three standard deviations above or below the mean (within each design cell) were eliminated from subsequent analysis as outliers: between two and three participants were eliminated from each block/stimulus category/condition group. Given the small number of outliers per individual group, we do not explore alternative exclusion criteria. Participants' RTs are summarized below (Fig. 1 and 2). Of note, observe the relative slowing of RTs in the alcohol conditions, after the social priming task.

As a preliminary remark, note that RTs in the Alcohol Addiction condition are lower than the corresponding RTs in the Neutral condition (even prior to the social manipulation). We believe this difference to be immaterial, since the impact of social priming is examined within-participants, but we explore it in more detail below anyway.

Omnibus Repeated-Measures ANOVA
IVs: Stimulus Category, Social Priming condition, Block

If alcohol-related social priming (Tom or Neil) induces an alcohol attentional bias, then there should be an interaction between Block (within participants), Social Priming Condition (three levels, between participants), and Stimulus Category (two levels, within participants), on RTs. Regarding the Block variable, we utilised this as a two-level variable, electing to include RTs from Block 1 and Block 4, while excluding RTs from Blocks 2 and 3. RTs in Block 1 offer information about RTs unadulterated from practice effects, which might be different between alcohol and neutral stimuli. Block 4 allows us to examine the impact of social priming on RTs over a longer period of time, relative to Block 3.

Block 2 somewhat helps quantify the continued effect of the practice trials, but, beyond this, offers no additional value to the analysis. Block 3, meanwhile, is too close to the social priming manipulation. According to the literature, social priming is meant to activate relevant goal representations (in this case, regarding a healthy lifestyle, or alcohol consumption). Given that social priming is assumed to activate relevant goal representations (e.g., concerning a healthy

lifestyle or alcohol consumption), we expect any effects of attentional bias to persist or even increase over time, if the task following priming does not lead to immediate fulfilment of the goal (Bargh et al., 2001; Weingarten et al., 2016).

There was no significant three-way interaction, ($F(2, 143)=0.041$, $p>.05$, $\eta^2<.001$), between the Block, Social Priming condition, and Stimulus Category variables, but there was a significant two-way interaction between Block and Social Priming condition, ($F(2, 143)=3.546$, $p=.031$, $\eta^2=.004$; see Appendix 2). We observed that participants' RTs in the Alcohol conditions decreased by a slower rate, compared to the Neutral condition, between Blocks 1 and 4 (see Supplementary Materials, General Appendix Figure 2, and Appendix 3), which is the key finding in this work. Note, overall, there was no main effect for Stimulus Category ($F(1, 143)=1.88$, $p>.05$, $\eta^2<.001$; see Appendix 2), as expected, since the sample was primarily light drinkers. Also, as expected, there was a significant main effect for Block ($F(1, 143)=76.236$, $p<.001$, $\eta^2=.044$; see Appendix 2), indicating that RTs differed between the first and last blocks. A main effect of Social Priming Condition, ($F(2, 143)=3.264$, $p=.041$, $\eta^2=.036$; see Appendix 2) challenged our assumption that social priming was equivalent across the three characters, as participants in the Neutral condition exhibited the slowest RTs, while participants in the Alcohol Addiction condition exhibited the quickest RTs. As noted, this difference is immaterial, since the impact of social priming was examined within-participants.

Notwithstanding our belief that the most valid examination of our hypotheses is across Blocks 1 and 4, readers might wonder about the impact on results, from the inclusion of Blocks 2, 3 RTs as well. We repeated the above analyses with the Block variable coded as a four level one (all four blocks). All results trended in the same direction as above, including the Block, Social Priming interaction, but no longer attaining significance (Supplementary Materials, General Appendix).

Another potential issue concerns baseline RTs. As can be seen most clearly in Figure 1 (in Supplementary Materials, General Appendix), baseline (Block 1) alcohol RTs are noticeably slower in the Alcohol Addiction condition, relative to RTs in the two other conditions, as evidenced by a one-way ANOVA: $F(2,141) = 3.988$, $p = .021$. It is worth noting that such

baseline differences may be due to random sampling variation, but they should not be readily dismissed as such. For example, they may reflect avoidance effects at baseline. In any case, recall that we are inferring an effect of social priming, from a deceleration of training effects in the Alcohol Addiction and Alcohol Preoccupation conditions, relative to the Neutral condition. However, as opposed to social priming having an effect on participants' RTs, a floor effect may be preventing RTs in these conditions from falling any further. In order to address this possibility, we first note that uncorrected post-hoc comparisons show that Block 1 alcohol RTs for the Alcohol Addiction condition are significantly lower, compared to the Neutral condition ($p=.033$), and nearly so, relative to the Alcohol Preoccupation condition ($p=.054$); however, the RTs for the Alcohol Preoccupation condition are indistinguishable from RTs in the Neutral condition ($p=.972$). Accordingly, we re-ran the mixed design ANOVA on alcohol RTs, with Block and Social Priming as independent variables, but with the latter variable now including only the Neutral and Alcohol Preoccupation conditions. The crucial interaction of Block and Social Priming still approached significance, ($F(1,91) = 3.552$, $p = .063$), even in the absence of the Alcohol Addiction condition, suggesting a prevailing social priming effect, in spite of baseline differences across conditions.

Overall, Alcohol Preoccupation condition Block 1 RTs are (just about) reliably higher than Alcohol Addiction ones, but the interaction (just about) persists. Additionally, the profile of RT changes before and after social priming is nearly identical across the Alcohol Preoccupation and the Alcohol Addiction conditions. Therefore, we conclude it is unlikely that our results are confounded by floor effects in the Alcohol Addiction condition.

Referring back to the initial Block 1 and Block 4 analysis, a two-way interaction between Block and Social Priming Condition was further analysed with Holm-corrected post hoc t-tests, a correction technique that offers a good balance between controlling for family-wise Type I error rate and inflating Type II error. The post-hoc tests showed a greater slowing down in the Alcohol conditions, relative to the Neutral condition (see Supplementary Materials, Appendix 3).

Discussion

The purpose of this study was to test whether social priming could induce an alcohol attentional bias. Based on Goldfarb et al. (2011), and earlier work by Dijksterhuis and van Knippenberg (1998), we hypothesised that a social priming task would induce an alcohol attentional bias. To test this hypothesis, we compared participants' average RTs in an alcohol Stroop task across four Blocks, with a social priming interference task between Blocks 2 and 3. Given our expectation that practice effects would gradually result in improved performance throughout the experiment, an attentional bias could be observed through a slowing down of practice effects after the social priming task (Fig. 1), which would be supported by a three-way Block, Stimulus Category, and Social Priming condition interaction. However, such an interaction was not observed. Instead, we found a two-way (Block, Social Priming condition) interaction, with a greater slowing down of practice effects following the alcohol-related social priming conditions (for both the alcohol and neutral stimuli), relative to the Neutral condition. We can call such an effect a generalised attentional bias, that is, a generalised inhibition of attentional control, following alcohol-related social priming. As a result, it appears that alcohol-related social priming can impact attentional processes to a greater degree than the neutral social priming we employed, but any corresponding effects are not specific to alcohol stimuli. We think this is a potentially important finding, which challenges both our definition of attentional biases and the way such biases are typically measured or operationalised (Cox et al., 2006). Future work should look more deeply into the possibility that an alcohol mindset (which could involve any of pre-occupation, goal-directed action, automatic links with positive alcohol expectancies, etc.) induces a non-specific weakening of attentional control.

The present work is the first attempt to study social priming and alcohol-related attentional biases. As a result, it is unsurprising that there may be alternative interpretations. For example, it might be posited that the alcohol manipulation increased attentional control for the alcohol-Stroop tasks, making performance in the task less automatic. However, this seems implausible, as greater attentional control would be associated with faster reaction times, following standard Stroop theory.

That stated, the present work would benefit from several methodological refinements. We believe the use of social priming in research on alcohol attentional biases is interesting, but there are multiple challenges, including difficulty matching social priming manipulations for uniform engagement and establishing a consistent degree of participant engagement. Fairly puzzling is the finding that RTs were in general slower for John, the Neutral condition, given the simple, non-controversial persona. One possibility is that our participants demonstrated attention aversion/avoidance for the alcohol-related characters, who were described with a variety of unattractive features. Additionally, a possible explanation for the minimal difference between neutral and alcohol-related stimuli RTs is that, in the present sample of light drinkers, the two types of stimuli might have elicited equal "excitation" of relevant mental representations, a determining factor of priming effects according to Higgins et al. (1985). It is also possible that increasing exposure time to priming, beyond the five minutes allotted in this task, might increase the priming task's effect (cf. Dijksterhuis & van Knippenberg, 1998).

More generally, the reality of the social priming effect has come under question itself (Pashler et al., 2012), challenging this experimental programme. While this remains a possibility, it does beg the question of the source of this non-specific interference effect we presently observed. Either way, we hope to have illustrated a novel approach in the study of alcohol attentional biases, with some (even if currently limited) potential paths for manipulation.

Bibliography

Bargh, J. A., Chen, M., & Burrows, L. (1996). Automaticity of social behavior: Direct effects of trait construct and stereotype activation on action. *Journal of Personality and Social Psychology*, *71*(2), 230–244. https://doi.org/10.1037/0022-3514.71.2.230

Bargh, J., Gollwitzer, P., Lee-Chai, A., Barndollar, K., Trotschel, R. (2001). The Automated Will: Nonconscious Activation and Pursuit of Behavioral Goals. *Journal of Personality and Social Psychology, 81*(6), 1014-1027. https://doi.org/10.1037/0022-3514.81.6.1014

Butt, A., & John, E. (2021, December 7). *Alcohol-specific deaths in the UK - Office for National Statistics*. Office for National Statistics. https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/causesofdeath/bulletins/alcoholrelateddeathsintheunitedkingdom/registeredin2020

Cox, W. M., Fadardi, J. S., & Pothos, E.M. (2006). The addiction-Stroop test: Theoretical considerations and procedural recommendations. *Psychological Bulletin*, *132*(3):443–476. https://doi.org/10.1037/0033-2909.132.3.443

Cox, W. M., Klinger, E., & Fadardi, J. S. (2015). The motivational basis of cognitive determinants of addictive behaviors. *Addictive Behaviors*, *44*, 16–22. https://doi.org/10.1016/j.addbeh.2014.11.019

Dijksterhuis, A., & van Knippenberg, A. (1998). The relation between perception and behavior, or how to win a game of Trivial Pursuit. *Journal of Personality and Social Psychology*, *74*(4), 865–877. https://doi.org/10.1037/0022-3514.74.4.865

Field, A. (2009). *Discovering Statistics Using SPSS* (Third edition). Sage.

Field, M., & Cox, W. M. (2008). Attentional bias in addictive behaviors: A review of its development, causes, and consequences. *Drug and Alcohol Dependence*, *97*(1), 1–20. https://doi.org/10.1016/j.drugalcdep.2008.03.030

Friese, M., Hofmann, W., & Wiers, R. W. (2011). On taming horses and strengthening riders: Recent developments in research on interventions to improve self-control in health behaviors. *Self and Identity*, *10*(3), 336–351. https://doi.org/10.1080/15298868.2010.536417

Glass, G. V., Peckham, P. D., & Sanders, J. R. (1972). Consequences of failure to meet assumptions underlying the fixed effects analyses of variance and covariance. *Review of Educational Research*, *42*, 237–288. doi:10.3102/00346543042003237

Goldfarb, L., Aisenberg, D., & Henik, A. (2011). Think the thought, walk the walk – Social priming reduces the Stroop effect. *Cognition*, *118*(2), 193–200. https://doi.org/10.1016/j.cognition.2010.11.004

Higgins, E. T., Bargh, J. A., & Lombardi, W. J. (1985). Nature of priming effects on categorization. *Journal of Experimental Psychology: Learning, Memory, and Cognition*, *11*(1), 59–69. https://doi.org/10.1037/0278-7393.11.1.59

Kucera, H., & Francis, W. (1967). *Computational Analysis of Present-Day American English*. Brown University Press.

Pashler, H., Coburn, N., & Harris, C. R. (2012). Priming of Social Distance? Failure to Replicate Effects on Social and Food Judgments. *PLoS ONE*, *7*(8), e42510. https://doi.org/10.1371/journal.pone.0042510

Ramachandran, K. M., & Tsokos, C. P. (2015). *Mathematical Statistics with Applications.* Academic Press.

Robinson, T. E., & Berridge, K. C. (1993). The Neural Basis of Drug Craving: An Incentive-Sensitization Theory of Addiction. *Brain Research Reviews*, *18*, 247–291.

Schneider, W., Dumais, S. T., & Shiffrin, R. M. (1982). *Automatic/Control Processing and Attention*. University of Illinois.

Sharma, D., Albery, I. P., & Cook, C. (2001). Selective attentional bias to alcohol related stimuli in problem drinkers and non-problem drinkers. *Addiction*, *96*(2), 285–295. https://doi.org/10.1046/j.1360-0443.2001.96228512.x

Suri, G., & Gross, J. J. (2015). The Role of Attention in Motivated Behavior. *Journal of Experimental Psychology: General*, *144*(4), 864–872. https://doi.org/10.1037/xge0000088

Tiffany, S. T. (1990). A cognitive model of drug urges and drug-use behavior: Role of automatic and nonautomatic processes. *Psychological Review*, *97*(2), 147–168. https://doi.org/10.1037/0033-295X.97.2.147

Weingarten, E., Chen, Q., McAdams, M., Yi, J., Hepler, J., & Albarracin, D. (2016). From Prime Concepts to Action: A Meta-Analysis of the Behavioral Effects of Incidentally Presented Words. *Psychological Bulletin, 142*(5), 472-497.

Williams, J. M. G., Watts, F. N., MacLeod, C., & Mathews, A. (1988). *Cognitive Psychology and Emotional Disorders*. Wiley.