Alcohol intoxication and memory for events: A snapshot of alcohol myopia in a real-world drinking scenario

Nadja Schreiber Compo, Jacqueline R. Evans, Rolando N. Carol, Daniel Kemp, Daniella Villalba, Lindsay S. Ham, Stefan Rose

* Department of Psychology, Florida International University, Miami, FL, USA  
† Department of Psychology, University of Texas at El Paso, El Paso, TX, USA  
‡ Department of Psychology, University of Arkansas, Fayetteville, AR, USA  
§ Department of Chemistry, Florida International University, Miami, FL, USA

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PLEASE SCROLL DOWN FOR ARTICLE
Alcohol intoxication and memory for events: A snapshot of alcohol myopia in a real-world drinking scenario

Nadja Schreiber Compo1, Jacqueline R. Evans2, Rolando N. Carol1, Daniel Kemp1, Daniella Villalba1, Lindsay S. Ham3, and Stefan Rose4

1Department of Psychology Florida International University, Miami, FL, USA
2Department of Psychology University of Texas at El Paso, El Paso, TX, USA
3Department of Psychology University of Arkansas, Fayetteville, AR, USA
4Department of Chemistry Florida International University, Miami, FL, USA

Alcohol typically has a detrimental impact on memory across a variety of encoding and retrieval conditions (e.g., Mintzer, 2007; Ray & Bates, 2006). No research has addressed alcohol’s effect on memory for lengthy and interactive events and little has tested alcohol’s effect on free recall. In this study 94 participants were randomly assigned to alcohol, placebo, or control groups and consumed drinks in a bar-lab setting while interacting with a “bartender”. Immediately afterwards all participants freely recalled the bar interaction. Consistent with alcohol myopia theory, intoxicated participants only differed from placebo and control groups when recalling peripheral information. Expanding on the original hypervigilance hypothesis, placebo participants showed more conservative reporting behaviour than the alcohol or control groups by providing more uncertain and “don’t know” responses. Thus, alcohol intoxication had confined effects on memory for events, supporting and extending current theories.

Keywords: Event memory; Alcohol intoxication; Alcohol myopia; Hypervigilance hypothesis.

Research exploring alcohol’s effect on memory across a variety of encoding and retrieval conditions typically shows a detrimental effect (Maylor & Rabbitt, 1993; Mintzer, 2007), with alcohol impairing both encoding and retrieval (e.g., Ray & Bates, 2006; Soraci et al., 2007). At encoding, intoxicated participants are less able to attend to multiple cues, to relate incoming information to existing knowledge, to draw abstract inferences (Steele & Josephs, 1990), and to use precise elaborators or process semantic information (e.g., Marinkovic, Halgren, & Maltzman, 2004). At retrieval, alcohol decreases sensitivity in recognition tasks (e.g., Maylor, Rabitt, & Kingstone, 1987), hit rates (Mintzer, 2007), and retrieval from long-term memory (Nelson, McSpadden, Fromme, & Marlatt, 1986). For example, Maylor and colleagues presented alcohol and placebo participants with both previously presented and new words. Alcohol decreased sensitivity when distinguishing old from new words, suggesting that alcohol’s adverse effects are considerable at retrieval. Nelson and colleagues found that intoxicated participants showed worse long-term memory recall than sober participants when asked general knowledge questions (e.g., “What is the capital of Chile?”), but were not overconfident in recall or feeling of knowing judgements.

No research has examined alcohol’s effect on memory for interactive events, despite its applied significance. Arguably, personal involvement in a complex event has the potential to result in different encoding, storage, and retrieval processes...
than presentation of simple stimuli (e.g., word lists). Alcohol might have a weaker effect on memory for interactive events compared to the traditionally used stimuli, as increased attention could compensate for cognitive deficits while intoxicated. In contrast, possible impairment in retrieval strategies when intoxicated may translate into larger differences between sober and intoxicated participants when recalling complex scenarios. One study examining the effect of intoxication on memory found that alcohol affected memory for an observed staged event such that intoxicated participants recalled less (correct) information than sober on both immediate and delayed tests (Yuille & Tollestrup, 1990). However, the event was not interactive and was brief, and participants knew about the upcoming recall task. Therefore the present study examined the effect of intoxication on memory for more complex and ecologically relevant stimuli. By examining how people subsequently remember a drinking experience, the present study is taking a snapshot of how witnesses may differ in their memory for a personally involving event depending on their intoxication level. Expanding research on alcohol and memory by including stimulus material of practical significance can, for example, inform the applied field of legal psychology whether intoxicated witnesses are impaired in their ability to remember personally involving events. Despite expert witnesses’ (Kassin, Tubb, Hosch & Memon, 2001) and potential jurors’ opinions that intoxicated witnesses are impaired (Evans & Schreiber Compo, 2010), research has neglected including relevant encoding and retrieval conditions.

One account of alcohol’s effect on cognition is provided by “alcohol myopia” theory (Josephs & Steele, 1990; Steele & Josephs, 1990), which proposes a state of disproportionate attention to immediate situational cues at the expense of weaker, peripheral cues when intoxicated. As intoxicated people are unable to attend to all relevant situational cues simultaneously, salient cues (e.g., an insult) may be more influential than distal cues (e.g., possible arrest for fighting). Thus specific situational combinations of strong and weak cues elicit changes in output criteria and consequently behavioural differences between intoxicated and sober people (e.g., MacDonald, Fong, Zanna, & Martineau, 2000; Monahan & Lanutti, 2000).

Because of reduced cognitive capacity, the effects of intoxication depend on the presence/absence of other ongoing activity (Josephs & Steele, 1990). Intoxicated individuals focus more on primary tasks while neglecting additional stimuli in comparison to sober individuals. A study on inattentional blindness supported this notion: intoxicated participants were less likely than sober to notice an atypical salient object while performing a competing task (Clifasefi, Takarangi, & Bergman, 2006). Alcohol’s impact might therefore depend on level and type of distraction during a to-be-remembered event. To examine alcohol’s effect under conditions involving self-directed unlimited attention and self-directed retrieval, the current study included a lengthy, unstructured event that personally involved the participant, and a subsequent free recall task.

The current study used a free recall format, as few studies to date have tested alcohol’s effect on memory with measures other than recognition or cued recall (but see Cunningham, Milne, & Crawford, 2007; Garfinkel, Dienes, & Duka, 2006; Knowles & Duka, 2004; Ray, Bates & Bly, 2004). Unstructured retrieval is more ecologically valid than structured retrieval, and research shows that alcohol’s effect on memory depends on recall format. For example, intoxication impairs memory on explicit but not implicit tests (e.g., Ray et al., 2004). Similarly, in a remember-know-guess paradigm, alcohol affected “remember” judgements but not “know” judgements, suggesting that alcohol impairs memory when recognition is based on conscious recollection (“remember”) but not if recognition occurs without conscious recollection (“know”) (Curran & Hildebrandt, 1999).

Although research has consistently shown specific effects of alcohol on cognition, it has neglected conditions that provide ecological validity. Specifically, although alcohol myopia has been a popular theoretical explanation, it has never been examined in the context of memory for events under free recall conditions. Including a long participatory event within a detail-rich context in conjunction with a free recall task can help to expand the alcohol myopia model, as alcohol’s effects on memory may depend on the type of stimuli and tasks examined (e.g., De Cesarei, Codispoti, Schupp, & Stegagno, 2006). The present study therefore examined the effects of alcohol on the free recall of a lengthy interactive event. In line with alcohol myopia theory, we predicted that alcohol would impair the free recall of peripheral, but not central information, with no differences for placebo or sober participants. We further predicted that the
intoxicated participants would provide more irrelevant/subjective information than placebo or sober participants.

**METHOD**

**Participants**

A total of 94 undergraduates over the age of 21 participated in exchange for research credit. A telephone screening excluded individuals with medical or psychological risks contraindicating alcohol consumption. Eligible participants were told that they might consume up to 0.08 g/210L of alcohol, and were instructed to abstain from alcohol for 24 hours, abstain from eating/drinking for 4 hours prior to the study, and bring legal photo identification.

Participants completed an extensive consenting procedure and medical screening on site and were allowed to continue if they had consumed alcohol in the past year (≥ 3 drinks in one sitting), had no medical disorders aggravated by alcohol, were not pregnant, had not taken medications (except contraceptives), and had no problematic reaction to cranberry juice/alcohol. Problem drinkers were excluded if they scored ≥ 6 on the Brief Michigan Alcoholism Screening Test (Pokomy, Miller, & Kaplan, 1972). The final sample was primarily female (59%) and Hispanic (72%; 10% African-American, 16% Caucasian, and 2% Other). The mean age was 24 years.

**Design**

Participants were randomly assigned to one of three groups: an alcohol group knowingly consumed alcohol mixed with cranberry juice; a placebo group consumed a minimal dose of alcohol mixed with cranberry juice while a full dose was suggested; and a control group knowingly consumed only cranberry juice. A balanced placebo design that would have included a fourth anti-placebo condition (i.e., suggesting no alcohol although some is administered) was considered (Marlatt & Rohsenow, 1980). However, as problems with the anti-placebo condition’s believability at higher intoxication levels such as .08 g/210L have been reported (e.g., see Martin & Sayette, 1993, for a review), this condition was not included.

**Procedure**

To normalise drinking behaviour, participants were scheduled at 2 pm or later. Initial sobriety was verified via a baseline breath alcohol test. To ensure accurate breath alcohol concentration (BrAC) testing, all readings were administered via a benchtop Intoxilyzer 5000®, an instrument on the Department of Transportation’s (DOT) Conforming Products List of Evidential Breath Alcohol Measurement Devices. To ensure accuracy of the BrAC readings, this benchtop model was used as opposed to handheld preliminary breath test BrAC measurement instruments, which are used as initial screening devices for breath alcohol only (DOT, 2006). To further ensure accurate BrAC readings all instruments were calibrated every experiment day using distilled water (negative control) and a .08g/210L ethanol solution (positive control). Additionally, monthly calibrations were performed using distilled water and ethanol solutions of 0.05g/210L, 0.08g/210L, and .20g/210L. These calibrations ensured that instruments were measuring accurately across the study’s relevant BrAC range.

Eligible participants proceeded to the simulated “barlab” (i.e., a dimly lit room equipped with bar furniture, bar stools, music, bar paraphernalia, and a dart board). After “bartenders” made small talk with participants and tried to make them feel comfortable, participants were encouraged to make use of the entertainment options in the room. Participants spent an average of 55 minutes in the bar (alcohol: 61 minutes; placebo: 55 minutes; control: 47 minutes). Participants watched the bartender prepare their three beverages. For the alcohol group, participants’ weight and sex were used to calculate the dose required to achieve a peak BrAC of .06 to .08 g/210L at 30–40 minutes after drinking, assuming an average 0.15 g/210L/hr metabolism rate. Dose was computed using a modified formula based on Fisher, Simpson, and Kapur (1987), consisting of 2.35 ml 40% USP units of alcohol/kg of body weight for women and 2.82 ml 40% USP units of alcohol/kg of body weight for men, mixed 1:4 parts vodka:cranberry juice (e.g., MacDonald, Baker, Stewart, & Skinner, 2000). Placebo participants were led to believe that they would also reach a BrAC of .08 g/210L. However, their three drinks contained only enough alcohol to achieve a peak BrAC of .010–.020 g/210L at 30–40 minutes after ingestion. To increase the placebo’s
believability, the bartender poured a calculated mixture of vodka and water from a vodka bottle into concentrated cranberry juice (to prevent a “watered-down” taste). Control participants saw the bartender pour cranberry juice into each glass. A lime slice was added to all drinks (primarily to disguise taste in the placebo condition) and participants were asked to finish their beverages within 30 minutes. BrAC was measured at 20 and 30 minutes after the last drink for all participants. If the alcohol group’s BrAC had not reached 0.06–0.08% at 30 minutes, they were tested every 10 minutes (up to 60 minutes) until reaching the target BrAC range.

Next, the participants were taken to a different room, their BrAC was measured, and they received written instructions for the free recall test. Their task was to recall their experience in the barlab, from their initial arrival until leaving approximately an hour later. Participants were unaware of this recall task until they received the instructions. The task examined incidental memory, mimicking real-world witness scenarios by avoiding heightened attention during encoding and rehearsal after encoding. To enhance memory for events based on the “encoding specificity principle”, participants were asked to picture the bar and think back to where they were sitting to reinstate mentally the original encoding context (Fisher & Geiselman, 1992). They were then instructed to write down as much information as possible about the bar, describing the scenario in detail. Recall instructions were purposely phrased to create a low reporting threshold: participants were encouraged to report everything even if they thought it was trivial. Participants were informed that they had 10 minutes to complete the task. If participants had not completed the task after 10 minutes they were given one additional reminder before the experimenter took the task. The average time spent on the task was 10.7 minutes, with no significant difference among intoxication levels.

All participants then filled out intoxication and believability ratings and were debriefed. Intoxicated participants remained in the lab until two consecutive BrAC readings of less than 0.04g/210L were obtained and behavioural observations indicated a safe release. All free narratives were segmented into units of information. A unit was defined as any piece of new information. The to-be-remembered event was long, loosely based on a script, and included ad lib conversation between participant and bartender. While drinking in the barlab the participant was facing and talking to the bartender, and receiving drinks from the bartender. The bartender was instructed to initiate small talk, but only to continue the conversation if the participant reciprocated. As the bartender ensured via his actions that he was the focus of attention throughout the drinking event, all information concerning the bartender was considered central, whereas information about the barlab itself was considered peripheral. For scoring purposes there were two main categories: verifiable and unverifiable. Within the verifiable scoring category each unit was scored as central (information about the bartender, e.g., “He was blond”), peripheral (information about the bar, e.g., “There was a dartboard”), uncertain (“He may have been blond”), or “don’t know”. Surprisingly, some participants included “don’t know” in their reports (e.g., “He was blond, but I don’t know how tall he was”). Within the unverifiable scoring category, each unit was scored either as subjective (participant’s opinion, e.g., “He was cute”), action (an action that took place in the bar, e.g., “I tripped”), or conversation (“We talked about school”).

All segments were scored by a rater blind to participant condition. A subset of 10 narratives were scored independently by a second rater. Inter-rater agreement across all scoring categories reached a satisfactory level with an ICC = .89.

RESULTS

Manipulation checks

To verify the intoxication manipulation a series of BrAC readings were analysed. For the alcohol condition, mean BrACs halfway through and at the end of the to-be-encoded event were both .07, as was the BrAC at retrieval (all SDs = .02). For the placebo condition, the mean BrAC at all three points was .01 (SD = .01). The mean peak BrACs for the alcohol and placebo groups respectively were .08 (SD = .02) and .01 (SD = .02). These data suggest that alcohol participants were on the ascending limb of their BrAC curve during both encoding and retrieval.

Believability ratings, on a scale from 1–10 (not at all – completely), confirmed that participants in the alcohol and placebo condition felt intoxicated. When asked whether they believed they were intoxicated at the .08 level, alcohol participants’
mean rating was 7.9, that of placebo participants was 3.8, and controls’ 1.1. When asked whether they believed they consumed alcohol, the ratings were 9.2 (alcohol), 5.3 (placebo), and 1.3 (control).

**Free recall data**

Analyses examined possible differences between intoxication levels (alcohol vs placebo vs control) in reporting verifiable, unverifiable, and overall amount of information. Fisher’s LSD tests were used for post-hoc comparisons.

**Verifiable information reported.** Analyses of variance (ANOVA) tested the effect of intoxication on number of reported accurate central and uncertain details and “don’t know” answers. Inaccurate central details were only reported by two participants and therefore were not analysed. Data for frequency of uncertain and “don’t know” answers were skewed; hence their square root transformations were analysed (see Cohen, Cohen, West, & Aiken, 2003). ANOVAs revealed no differences between groups in number of accurate central details, but significant differences in the number of uncertain details reported, \( p = .05 \), and “don’t know” answers, \( p < .05 \), (for statistical values see Table 1). Post-hoc comparisons revealed that the placebo group was more likely to indicate uncertainty than the alcohol group, \( p < .05 \), with no difference between placebo and control. The placebo group also reported more “don’t knows” than the control, \( p < .05 \), and alcohol groups, \( p < .10 \).

Differences across levels of intoxication for both accurate and inaccurate peripheral details were contrasted directly, as differences between intoxication groups were predicted a priori. Comparisons revealed that the alcohol group reported fewer accurate peripheral details than the placebo group, \( p < .05 \) and the control group, \( p = .10 \). There was no significant difference among the groups for inaccurate peripheral details recalled.

**Unverifiable information reported.** ANOVAs tested the effect of intoxication level on the number of subjective details, action details, and conversational phrases reported. As these data were skewed, ANOVAs were conducted using their square root transformations. Analyses revealed a difference among the groups in the number of subjective details reported, \( p = .01 \), with no difference for the number of action details or conversational phrases reported. Post-hoc comparisons revealed that the alcohol group reported more subjective information than the control group, \( p < .01 \) and the placebo group, \( p < .05 \), with no difference between placebo and control.

**Total amount of information reported.** ANOVAs examined the effect of intoxication on the overall number of words and informational units reported—across all scoring categories. There were no differences between intoxication groups for either variable.

**DISCUSSION**

The present study was the first to examine the effects of alcohol on memory for an interactive event. Analysis of free recall reports revealed that intoxicated participants were more likely to report subjective information and were less likely to report peripheral (i.e., scenario) information than placebo and control participants, with no group differences in the amount of central (i.e., person) information reported. Surprisingly, we found no differences between intoxication levels in the overall amount of information provided. Placebo participants were more likely to be uncertain than alcohol participants and more likely to report “don’t know” than control or alcohol participants.

On an applied level, our findings suggest that whether intoxicated individuals differ from sober individuals in how they remember an event may depend on the type of information being recalled. When asked to recall an event encoded while becoming increasingly intoxicated, these witnesses report as much information as sober or placebo witnesses, but what they report differs: they report more subjective, but less peripheral information.

Our findings support alcohol myopia and the attention-allocation model (e.g., Steele & Josephs, 1990) while extending it to memory for a lengthy interactive event. Specifically, as predicted, intoxicated participants reported less peripheral information, such as the surrounding details of the drinking event, than placebo or control participants, with no difference between the groups for central details, namely person
<table>
<thead>
<tr>
<th>Intoxication level</th>
<th>Alcohol (n = 30)</th>
<th>Placebo (n = 37)</th>
<th>Control (n = 27)</th>
<th>F</th>
<th>η²</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Verifiable information</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Central details (accurate)</td>
<td>3.40 (3.94)</td>
<td>3.24 (5.56)</td>
<td>3.15 (5.13)</td>
<td>.02</td>
<td>.00</td>
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<tr>
<td>Peripheral details (accurate)</td>
<td>39.03 (21.29)¹</td>
<td>50.84 (27.79)²</td>
<td>49.48 (20.73)²</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>Peripheral details (inaccurate)</td>
<td>.33 (.61)</td>
<td>.46 (.61)</td>
<td>.52 (1.28)</td>
<td>a</td>
<td></td>
</tr>
<tr>
<td>Uncertain details*</td>
<td>.27 (.69)¹</td>
<td>.86 (1.41)²</td>
<td>.48 (.85)</td>
<td>3.09</td>
<td>.06</td>
</tr>
<tr>
<td>“Don’t know” answers*</td>
<td>.10 (.55)¹</td>
<td>.30 (.70)²</td>
<td>.00 (.00)¹</td>
<td>3.11</td>
<td>.06</td>
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<tr>
<td><strong>Unverifiable information</strong></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Subjective information*</td>
<td>3.60 (4.99)¹</td>
<td>1.84 (3.98)²</td>
<td>.96 (1.72)²</td>
<td>4.75</td>
<td>.09</td>
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<tr>
<td>Action details*</td>
<td>1.07 (1.57)</td>
<td>1.24 (1.71)</td>
<td>1.00 (2.79)</td>
<td>.72</td>
<td>.02</td>
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<tr>
<td>Conversational details*</td>
<td>1.50 (2.46)</td>
<td>1.08 (2.49)</td>
<td>1.07 (1.96)</td>
<td>.53</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Amount of information</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of words</td>
<td>188.97 (81.81)</td>
<td>187.46 (76.19)</td>
<td>189.04 (68.59)</td>
<td>.01</td>
<td>.00</td>
</tr>
<tr>
<td>Number of units</td>
<td>49.03 (21.80)</td>
<td>59.00 (25.19)</td>
<td>55.09 (22.95)</td>
<td>1.65</td>
<td>.04</td>
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</table>

Standard errors in parentheses.

*As data were skewed, analyses were conducted on square root transformations.

¹² Means with different superscripts are significantly different on LSD tests.

*Differences between means were contrasted directly.
information. Within the framework of alcohol myopia, Steele and Joseph proposed that alcohol affects cognitive functioning either via restricting a range of cues that can be perceived in a given situation (affecting attention) or via reducing the ability to process and extract meaning from the perceived information (affecting encoding/processing). Further, the effect of intoxication on a given task depends on the presence/absence of other ongoing activity (Josephs & Steele, 1990). Because of reduced attentional capacity, the intoxicated are more likely than sober individuals to focus on a primary task at the expense of additional to-be-processed stimuli. The effect of alcohol might therefore depend on the type of activity/level of distraction during a to-be-remembered event and its resulting attentional or encoding deficits. We argue that the to-be-remembered event in the present study included considerable distraction for participants, such that interaction with bartender, drinking and entertainment likely occupied attentional resources at the expense of processing decorations and details of the bar. In line with this attention-allocation model, intoxicated participants’ attention was affected, resulting in impaired recall of peripheral details compared to placebo and sober participants.

Although the alcohol group spent on average the most time in the bar, having more opportunities to attend to and encode peripheral bar details, intoxicated participants reported fewer of these details. Thus, under conditions of seemingly unlimited time during encoding, alcohol myopia still exists, suggesting that alcohol’s effects on memory for long interactive events are strikingly similar to its effects under focused and limited encoding conditions. As the current study’s intent was to be the first to provide a snapshot of alcohol’s possible effect on memory for an interactive event, its findings do not allow for inferences regarding alcohol’s respective effects at encoding vs retrieval. In other words, whether it was alcohol’s increasing effect at time of encoding the bar scenario or its effect on retrieval that produced our results will need to be addressed in future research. Such a study would need to control for recall delay while also accounting for state-dependency effects across all intoxication groups.

We find it noteworthy that participants’ free recall was very accurate. Across intoxication groups the percentage of correctly recalled information was high, possibly due to the recall format. Open-ended questions have been shown to elicit a high percentage of accurate recall, compared to cued or multiple choice questions (e.g., Milne & Bull, 1999). Also of note is that intoxicated participants did not report more false information (of any kind), but rather fewer accurate peripheral details. In other words, alcohol intoxication did not increase the number of falsely recalled items, but rather decreased recall of one specific type of information. Others have reported a selective effect of alcohol on accurate but not inaccurate recall (Yuille & Tollestrup, 1990). It should be pointed out, however, that despite the lack of difference in absolute number for false details, the difference in correct details reported suggests a change in distribution of information recalled when intoxicated. Furthermore, intoxicated participants may have “compensated” for this lack of correct recall via reporting more subjective information, i.e., information that was irrelevant from a memory accuracy standpoint, so that the total amount of information did not differ among the groups. This suggests that alcohol’s effect on free recall for a long interactive event presents itself not as more false recall or less overall recall, but rather as increases and decreases in recall for specific types of information. The present study only included free recall; thus it is unknown whether additional recall modes, such as cued recall or recognition tests, would shed a different light on the effect of intoxication. Future research should examine memory for interactive events while manipulating retrieval format to render a more complete understanding of alcohol’s effect on the different types of memory.

Our study also revealed interesting results regarding the placebo group, highlighting the importance of its inclusion in alcohol and memory research. For some comparisons (e.g., subjective or inaccurate peripheral information), the placebo group fell between the control and alcohol groups, indicating that a combination of pharmacological and expectancy effects explain memory impairment in the alcohol group. For comparisons relevant to alcohol myopia, the pattern of results in the placebo group was more similar to the control than the alcohol group, suggesting that alcohol myopia under our testing conditions may be more closely linked to the pharmacological effects of alcohol.

Of further interest were the differences between placebo and other groups for uncertain and “don’t know” answers. Past findings suggest
that, depending on the metacognitive and social processes involved, placebos can perform better or worse than control participants. For example, according to the hypervigilance hypothesis, alcohol expectancy can lead to compensatory behaviour for anticipated poorer performance (Fillmore & Blackburn, 2002; Testa, Fillmore, Norris, Abbey, Curtin et al., 2006). Our results are in line with this hypervigilance hypothesis: sober participants who thought they were intoxicated (placebo) displayed heightened sensitivity to the fallibility of their own memory. They spontaneously indicated more often that they were uncertain about their answers than intoxicated participants, and were more likely to indicate lack of memory than control and alcohol participants. This indicates that placebo participants’ metacognitive control mechanism was “hypervigilant”, leading to compensatory behaviours, such as tagging reported information as “uncertain”. Actual intoxication may inhibit these specific metacognitive capacities.

Our study purposely examined alcohol’s effect under these encoding and retrieval conditions to test event memory in a realistic setting. The interpretation of our data is therefore confined to this study’s design. Specifically, alcohol participants encoded information on the ascending limb of the BrAC curve while retrieving close to the peak, as would be found in many typical real-world settings involving intoxicated witnesses. Furthermore, as this is the first study examining interactive event memory we did not vary the length of to-be-encoded event or recall format. Future studies should include different recall conditions to disentangle the respective impact of intoxication at encoding and retrieval. However, it should be noted that participants recalled many more peripheral than central details. In fact, on average participants remembered fewer than four central details, suggesting that the null finding could also be explained by a floor effect. Finally, our data extend the hypervigilance hypothesis to metacognitive processes in free recall. Future studies should address the circumstances under which falsely thinking that one is intoxicated result in different memory reports from when one is actually intoxicated.

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