# Intoxication and Memory

The overview that follows is offered to help the trier of fact understand how alcohol and other intoxicants affect memory — what they impair, what they spare, and what an intoxicated witness's account can and cannot bear. Intoxicated witnesses, victims, and defendants are common in the justice system, and their memories are routinely misunderstood in both directions: dismissed wholesale as worthless, or credited as if sobriety made no difference. Its purpose is to define the terms a court is likely to encounter, to summarize the research, and to do so in plain language and without favoring any party. A fuller, in-depth treatment of alcohol's effects on the brain and cognition, including alcohol-induced blackouts, is available at www.psy.law.

## Intoxicated Witnesses Are Common

Intoxication at the scene of a crime is far from unusual. Surveyed officers report that intoxicated witnesses are common: in one study, seventy-three percent described such witnesses as common or very common, and ninety percent had interviewed one within the past month (Evans, Schreiber Compo, & Russano, 2009). Intoxication is especially prevalent in sexual-assault cases; in one national survey, a large majority of college women who reported being raped reported being intoxicated at the time (Mohler-Kuo, Dowdall, Koss, & Wechsler, 2004). Because the system must so often rely on accounts given by people who were drinking or using drugs, understanding how intoxication actually affects memory is a practical necessity rather than an academic question.

## How Alcohol Affects Memory

Alcohol's effect on memory is selective, not global. It primarily disrupts the ability to form new long-term memories — the encoding and consolidation of events as they happen — while leaving largely intact both previously established long-term memories and the ability to hold information in mind for a few seconds (short-term or working memory). The impairment is dose-dependent: small amounts produce subtle effects, and the deficit grows as consumption rises, particularly when drinking is rapid. A useful way to understand the pattern is "alcohol myopia": intoxication narrows the focus of attention onto whatever is most immediate and salient, so that central features may still be encoded while peripheral details are not. The biological mechanism centers on the hippocampus, the brain structure essential to forming new memories of events, which is exquisitely sensitive to alcohol — a subject developed further in the companion paper on the hippocampus.

## Blackouts

At higher doses, alcohol can produce a blackout: a period of anterograde amnesia during which the drinker fails to form lasting memories even while remaining awake and active. Blackouts come in two forms — en bloc, a solid gap with no memory at all, and fragmentary, with spotty islands of memory that cues can sometimes expand. They are far more common among ordinary social drinkers than once assumed; roughly half of drinkers report having experienced one (White, Jamieson-Drake, & Swartzwelder, 2002; White, Signer, Kraus, & Swartzwelder, 2004). Three points are essential and frequently misunderstood. A blackout is not the same as passing out: a person in a blackout can walk, talk, drive, and engage in complex interactions, including sexual activity, that appear normal to observers. The person is not consciously "absent"; they are simply not recording. And, crucially, the absence of memory does not mean the events did not happen — it means they were never stored. A fuller account of alcohol's effects on the brain and of blackouts, together with a continuing-legal-education program on blackouts and sexual-assault allegations, is available at www.psy.law.

## What Intoxicated Witnesses Can and Cannot Remember

The most important — and most often misstated — finding concerns the difference between how much an intoxicated witness remembers and how accurate that memory is. The research consistently indicates that alcohol reduces the completeness of an account (the quantity of detail reported), especially peripheral detail, without necessarily reducing its accuracy (the proportion of reported details that are correct). A meta-analysis found that intoxication had a moderate effect in lowering the number of correct details recalled but no significant effect on the number of errors (Jores, Colloff, Kloft, Smailes, & Flowe, 2019). A laboratory study found that intoxicated and sober participants reported similar overall amounts but that intoxicated participants gave more subjective impressions and fewer peripheral details, consistent with alcohol myopia (Schreiber Compo et al., 2011). And a field study reaching much higher intoxication levels than ethics permits in the lab found that elevated intoxication reduced the quantity and quality of recall yet did not impair the witness's ability to identify the perpetrator from a lineup (Altman, Schreiber Compo, McQuiston, Hagsand, & Cervera, 2018). The forensic lesson is that an intoxicated witness's account is typically less complete, not necessarily less accurate, and that "remembered less" should not be equated with "unreliable."

## Cannabis and Other Drugs

Alcohol is not the only intoxicant officers encounter, but it is by far the most studied; far less is known about other drugs. The limited research on cannabis points in a similar direction to alcohol. In a field study conducted in Amsterdam coffee shops, witnesses under the influence of cannabis recalled fewer correct details — particularly fewer correct descriptions of people — than sober witnesses, with no increase in incorrect recall, and cannabis was not associated with poorer lineup identification (Vredeveldt, Charman, den Blanken, & Hooydonk, 2018). These results are preliminary and should be read with caution, but as cannabis is legalized in more jurisdictions, cannabis-intoxicated witnesses will become more common, and the existing evidence suggests a pattern like alcohol's — reduced completeness with relatively preserved identification.

## A Caution About the Research: Laboratory Versus Field

An important limit shapes all of this evidence. For ethical reasons, laboratory studies cannot intoxicate participants beyond a blood-alcohol concentration of roughly 0.08 percent — the legal driving limit in most of the United States — yet real witnesses are often far more intoxicated, with archival averages around 0.11 percent and field studies documenting levels as high as 0.29 percent. Laboratory and field studies, conducted at these different ranges, do not always yield the same results, and field studies sacrifice the experimental control that allows firm cause-and-effect conclusions. The science is therefore strongest in its general direction — reduced completeness, relatively preserved accuracy and identification — and weakest in giving precise predictions for a particular witness at a particular level of intoxication.

## Intoxication, Memory, and the Law

Intoxication reaches the law through several distinct questions that should not be conflated. When a witness or victim was intoxicated, the issue is the completeness and reliability of the account; the research cautions against assuming that an intoxicated witness is simply unreliable, since accuracy is often preserved even where detail is lost. In sexual-assault cases the victim's intoxication raises a separate question of capacity to consent, where it is essential to distinguish a blackout — a later inability to remember — from incapacitation at the time, since a person may have been unable to consent, or may have appeared functional, independent of whether they can now recall the events (Neal, Scott, & Grimsbo, 1993). A defendant's voluntary intoxication raises yet another question — whether evidence of intoxication may be used to negate criminal intent —

on which jurisdictions differ, and a State may constitutionally bar such evidence (Montana v. Egelhoff, 1996); a defendant's inability to remember the offense is addressed in the companion paper on the hippocampus.

A witness who was intoxicated is not for that reason incompetent to testify; under Federal Rule of Evidence 601 the presumption of competency applies, and the effect of intoxication on the account goes to weight. Whether an expert may explain how alcohol and other drugs affect memory — including the encoding deficit, alcohol myopia, blackouts, and the distinction between completeness and accuracy — is governed by the rules on scientific and expert evidence: Daubert v. Merrell Dow Pharmaceuticals (1993), Kumho Tire Co. v. Carmichael (1999), and Federal Rule of Evidence 702 in federal court and the states that follow them, and the general-acceptance test of Frye v. United States (1923) elsewhere. Such testimony is offered to inform the trier of fact about how intoxication affects memory — not to opine on whether a particular intoxicated witness is accurate, a judgment the law reserves to the fact-finder.

## Special Issues in Legal Practice

The principles described above apply with equal force to every party in a legal proceeding. Memory operates the same way regardless of who is asking the questions, and the science summarized here favors no side. What differs between the parties is not the science but the vantage point — the particular places where memory issues tend to surface, and the particular errors each party is best positioned to guard against. The two summaries below identify those recurring issues. They are offered for orientation, not as litigation strategy; in every case the controlling question is what the evidence in that case will, and will not, support, and the expert's role is to inform the trier of fact rather than to advocate for either side.

### Special Issues for Prosecutors

For the State, the research helps prevent an intoxicated witness's account from being undervalued. Because alcohol and cannabis tend to reduce the completeness of memory more than its accuracy, and do not clearly impair the ability to identify a perpetrator, gaps in an intoxicated witness's or victim's account — especially of peripheral detail — should not be mistaken, by the State or the jury, for unreliability or fabrication, and the core of a well-encoded account may remain dependable. In sexual-assault cases the distinction between a blackout and incapacity is central: a victim's present inability to remember does not show that the events did not occur, nor does it by itself establish or defeat capacity to consent at the time, which must be assessed on its own evidence. The errors the prosecution is best positioned to guard against are over-reaching with the science — treating reduced detail as proof of accuracy, or a blackout as proof of incapacity — and failing to obtain a prompt, careful account that captures what a still-impaired or recovering witness can reliably provide.

### Special Issues for Defense

For the defense, the recurring task is to show how intoxication bears on the reliability and completeness of what a witness reports — recognizing that an intoxicated witness can be sincere and yet have encoded little, particularly of peripheral but case-critical detail. Alcohol myopia means attention narrowed at the time, so important information may never have been registered; higher real-world intoxication levels, beyond what laboratory studies can reach, may degrade both quantity and quality of recall; and later, fuller accounts may owe more to reconstruction or suggestion than to recovered memory, especially where a blackout left a genuine gap. The defense may also probe the distinction between a blackout and incapacity, and, where the client was intoxicated, the bearing of that intoxication on the issues the jurisdiction permits it to address. The law contemplates that these matters be placed before the trier of fact through cross-examination,

through challenge to the conditions of observation and questioning, and, where the governing standard is met, through expert testimony (Daubert v. Merrell Dow Pharmaceuticals, 1993; Frye v. United States, 1923). The aim is not to assume that intoxicated memory is worthless — accuracy is often preserved — but to ensure that what intoxication did and did not affect is accurately weighed.

## References


Altman, C. M., Schreiber Compo, N., McQuiston, D., Hagsand, A. V., & Cervera, J. (2018). Witnesses' memory for events and faces under elevated levels of intoxication. Memory, 26(7), 946–959. https://doi.org/10.1080/09658211.2018.1445758

Evans, J. R., Schreiber Compo, N., & Russano, M. B. (2009). Intoxicated witnesses and suspects: Procedures and prevalence according to law enforcement. Psychology, Public Policy, and Law, 15(3), 194–221. https://doi.org/10.1037/a0016837

Jores, T., Colloff, M. F., Kloft, L., Smailes, H., & Flowe, H. D. (2019). A meta-analysis of the effects of acute alcohol intoxication on witness recall. Applied Cognitive Psychology, 33(3), 334–343. https://doi.org/10.1002/acp.3533

Mohler-Kuo, M., Dowdall, G. W., Koss, M. P., & Wechsler, H. (2004). Correlates of rape while intoxicated in a national sample of college women. Journal of Studies on Alcohol, 65(1), 37–45. https://doi.org/10.15288/jsa.2004.65.37

Neal, D. E., Scott, E. M., & Grimsbo, R. A. (1993). A case report—Alcohol-induced blackouts during sexual intercourse: Legal responsibility? International Journal of Offender Therapy and Comparative Criminology, 37(4), 325–329.

Schreiber Compo, N., Evans, J. R., Carol, R. N., Kemp, D., Villalba, D., Ham, L. S., & Rose, S. (2011). Alcohol intoxication and memory for events: A snapshot of alcohol myopia in a real-world drinking scenario. Memory, 19(2), 202–210. https://doi.org/10.1080/09658211.2010.546802

Vredeveldt, A., Charman, S. D., den Blanken, A., & Hooydonk, M. (2018). Effects of cannabis on eyewitness memory: A field study. Applied Cognitive Psychology, 32(4), 420–428. https://doi.org/10.1002/acp.3414

White, A. M. (2003). What happened? Alcohol, memory blackouts, and the brain. Alcohol Research & Health, 27(2), 186–196.

White, A. M., Jamieson-Drake, D. W., & Swartzwelder, H. S. (2002). Prevalence and correlates of alcohol-induced blackouts among college students: Results of an e-mail survey. Journal of American College Health, 51(3), 117–131. https://doi.org/10.1080/07448480209596339

White, A. M., Signer, M. L., Kraus, C. L., & Swartzwelder, H. S. (2004). Experiential aspects of alcohol-induced blackouts among college students. The American Journal of Drug and Alcohol Abuse, 30(1), 205–224. https://doi.org/10.1081/ADA-120029874


## Legal Authorities


Daubert v. Merrell Dow Pharmaceuticals, Inc., 509 U.S. 579 (1993).

Frye v. United States, 293 F. 1013 (D.C. Cir. 1923).

Kumho Tire Co. v. Carmichael, 526 U.S. 137 (1999).

Montana v. Egelhoff, 518 U.S. 37 (1996).

Fed. R. Evid. 601.

Fed. R. Evid. 702.



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