

# How alcohol causes blackouts and blocks memories

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September 26 at 6:14 PM

The allegations of sexual assault against Judge Brett M. Kavanaugh have a common element of binge drinking, and highlight the powerful effects alcohol can have on adolescents and their still-developing brains. Alcohol not only changes behavior — sometimes with disastrous consequences — it can also interfere with memory formation, creating gaps that experts refer to as blackouts.

“In the moment, the person can be functioning normally, with no sign there’s going to be memory impairment. But because those memories never get consolidated and stored, it’s like they never occurred, so you can’t recall them later on,” said Kate Carey, a clinical psychologist at Brown University School of Public Health. “Which doesn’t mean it didn’t happen.”

Binge drinking and the imperfection of memory are likely to be discussed during Thursday’s hearing before the Senate Judiciary Committee. [Christine Blasey Ford](#) said the Supreme Court nominee became “stumbling drunk” and attacked her at a party in high school. Kavanaugh has denied the allegation. He also said [in a television interview](#) that he’d never had a blackout from alcohol.

Binge drinking among U.S. high school students peaked in the early 1980s, when Kavanaugh was a student at Georgetown Prep. High school binge drinking has declined in recent decades in part because dozens of states, as well as the District of Columbia, raised the minimum legal drinking age to 21 in the 1980s, said Katherine Keyes, an epidemiologist at Columbia University and an expert on alcohol consumption.

Alcohol impairs memory formation, but not in a simple or easily anticipated way, researchers say. There’s no clear cutoff point at which memory will be suppressed. David J. Nutt, a psychiatrist and alcohol expert at Imperial College London, said alcohol blocks the neurotransmitter glutamate, which is essential to memory formation. That typically happens when people are “very, very drunk,” he said.

Adolescents are at risk of getting very drunk, in part because they are less sensitive to sedative effects, such as sleepiness or stumbling, that tell adults they’ve had too much, according to Marisa Silveri, director of the Neurodevelopmental Laboratory on Addictions and Mental Health at McLean Hospital.

At the same time, they are more vulnerable to the effects of alcohol on memory. Studies suggest that alcohol has a more pronounced [negative effect](#) on memory formation in the immature brain. And the kind of drinking teens are likely to engage in at weekend house parties are a particular risk factor for memory impairment.

“High quantities in short periods of time — that’s exactly the kind of drinking that’s likely to raise blood alcohol concentration to high levels, and raise it quickly. And a rapid rise is predictive of having memory impairment,” Silveri said.

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But even before then, alcohol can lead to impulsive behavior, including sexual disinhibition. Teenagers already have less impulse control than adults because their brain's prefrontal cortex — the region responsible for self-control — is not yet mature. Alcohol can dampen inhibitions further. It affects brain systems that regulate behavior and impulse control.

“The frontal lobes make us tell the truth, make us be on time, make us be nice to people even if we don't want to,” Nutt said. “Alcohol switches off the frontal lobes or dampens them down, so you're less able to control these deeper impulses.”

This is a feature and not a bug for many young people, notes Marion Nestle, professor emerita of nutrition and food studies at NYU.

“The whole purpose of binge drinking is to go blotto so you can behave terribly and you're not responsible for it,” she said.

A person can have both a partial blackout or a complete blackout after intense drinking and not even realize it.

“Sometimes people don't remember that they blacked out. Someone has to say, ‘Remember when you did that last night?’ and you say ‘No,’” Keyes said.

A [second accuser](#), Deborah Ramirez, said she and Kavanaugh participated in a drinking game in a dorm room during their first year at Yale. She acknowledges gaps in her memory due to intoxication, but alleges that Kavanaugh exposed himself and thrust his penis toward her face before she pushed him away. Kavanaugh has denied the story. Other questions about the nature of memories are likely to arise during Thursday's hearing. Senators supportive of Kavanaugh may question why some details are vivid to Ford while others, such as where and when, exactly, the party was held, are not. Researchers say traumatic events can become indelible in a spotty fashion, where stressful details may haunt people for a lifetime, but others may fade.

“If there's a strong emotion associated with an event, that event is inscribed in the machinery of memory in bold type, as opposed to other memories that don't have an emotional component to them — which are inscribed basically in a lighter font,” said Daniel Weinberger, director of the Lieber Institute for Brain Development affiliated with Johns Hopkins School of Medicine.

Researchers said that whatever the outcome of Thursday's hearing, the accusations against Kavanaugh bring a critical public health issue into a national spotlight.

According to the Centers for Disease Control and Prevention, 37 million U.S. adults in 2015 engaged in binge-drinking once a week, consuming seven drinks per binge on average. That was according to the drinkers themselves; people are known to underreport or underestimate the amount of alcohol they consume.

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Although alcohol consumption among high schoolers has dropped in recent decades, about one-third of students report consuming alcohol in the past month, and half of the drinkers said they engaged in binge drinking, according to Robert Brewer, head of the CDC's alcohol program.

“There are still large numbers of teenagers and high school kids who engage in drinking and partying that is really dangerous,” said Susan Tapert, a psychologist at the University of California, San Diego. “Even if you emerge from the evening unscathed, you’re doing some harm to your body, and you’re definitely doing some harm to your brain.”