Fragmentary and En Bloc Blackouts

Two types of *Blackouts* (Goodwin 1969 & 1970; White 2003, p.1)

- Fragmentary (aka "*Gray-outs*" or "*Brownouts*")
  - Most blackouts are fragmentary (White 2003 & 2004; Hartzler and Fromme 2003b; Goodwin et al. 1969b)
  - Partial blockage of memory formation
  - Bits and pieces get lost
  - Sometimes partial memories can be recovered with cues, <u>BUT</u> these "*recollections*" are subject to significant distortion. (Nash 2011)
- En Bloc (White 2003, p.4)
  - Zero memory for a period of time.
  - The record button was never on, so there are no memories to retrieve.
- Either version of blackouts can occur with a Blood Alcohol Concentration (BAC) as low as 0.14 (Ryback 1970; White 2003, p.6)

Aaron White notes (2003):

> In 1969, Goodwin and colleagues published two of the most influential studies in the literature on blackouts (Goodwin et al. 1969a,b). Based on interviews with 100 hospitalized alcoholics, 64 of whom had a history of blackouts, the authors posited the existence of two qualitatively different types of blackouts: en bloc and fragmentary blackouts. People experiencing en bloc blackouts are unable to recall any details whatsoever from events that occurred while they were intoxicated, despite all efforts by the drinkers or others to cue recall. Referring back to our general model of memory formation, it is as if the process of transferring information from short–term to long–term storage has been completely blocked. En bloc memory impairments tend to have a distinct onset. It is usually less clear when these blackouts end because people typically fall asleep before they are over. Interestingly, people appear able to keep information active in short–term memory for at least a few seconds. As a result, they can often carry on conversations, drive automobiles, and engage in other complicated behaviors. Information pertaining to these events is simply not transferred into long–term storage. Ryback (1970) wrote that intoxicated subjects in one of his studies "could carry on conversations during the amnesic state, but could not remember what they said or did 5 minutes earlier. Their immediate and remote memory were intact" (p. 1003). Similarly, in their study of memory impairments in intoxicated alcoholics, Goodwin and colleagues (1970) reported that subjects who experienced blackouts for testing sessions showed intact memory for up to 2 minutes while the sessions were taking place.
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> Unlike en bloc blackouts, fragmentary blackouts involve partial blocking of memory formation for events that occurred while the person was intoxicated. Goodwin and colleagues (1969a) reported that subjects experiencing fragmentary blackouts often become aware that they are missing pieces of events only after being reminded that the events occurred. Interestingly, these reminders trigger at least some recall of the initially missing information. Research suggests that fragmentary blackouts are far more common than those of the en bloc variety (White et al. 2004; Hartzler and Fromme 2003b; Goodwin et al. 1969b).
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> Aaron M. White, *What Happened? Alcohol, Memory Blackouts, and the Brain* (2003).
> Alcohol Research & Health. 2003 Vol 27(2) p. 188

Think of fragmentary blackouts/amnesia as "*islands of memory*". For instance, a person can recall getting to the party, then things go black, then the next island is standing in the kitchen talking with a friend, then things go black again, etc. But bear in mind the islands of recall the next morning are not necessarily in chronological order. In normal memory reconstruction the brain uses continuity to sequence events. When that continuity is blocked due to alcohol amnesia, the sequencing is more haphazard.



Research Abstracts on Fragmentary and En Bloc Blackout / Amnesia

Fragmentary blackouts: Their etiology and effect on alcohol expectancies.
Hartzler, Bryan and Fromme, Kim.
Alcoholism: Clinical and Experimental Research, Vol 27(4), Apr, 2003. pp. 628-637.
Abstract:

This alcohol-administration study addressed questions regarding the etiology of fragmentary blackouts (memory loss for intoxicated events that may be recalled with cues) and their effect on alcohol outcome expectancies. A placebo-controlled design addressed the etiology of fragmentary blackouts through assessment of memory formation before and after alcohol consumption. The effect of fragmentary blackouts on prospective beliefs about alcohol was assessed via a self-report outcome expectancy questionnaire and a measure of response latency for alcohol concepts presented after beverage consumption. Although Ss(age range 21 to 30 years) performed similarly on memory indices before consuming beverages, those who reported past fragmentary blackouts and consumed alcohol displayed marked difficulty with recall of a narrative when this was attempted both during intoxication and after detoxification, and with a source memory task presented during intoxication. Further, source recall contributed significantly to the episodic recall both during intoxication and after detoxification, and to positive outcome expectancies of those receiving alcohol. Findings suggest that fragmentary blackouts result from poor retrieval and individual differences in retrieval emerge after alcohol is consumed.

Fragmentary and en bloc blackouts: Similarity and distinction among episodes of alcohol-induced memory loss.

Hartzler, Bryan, et al.
Journal of Studies on Alcohol, Vol 64(4), Jul, 2003. pp. 547-550.

Abstract:

Objective: En bloc and fragmentary blackouts are distinguishable forms of alcohol-induced amnesia. The former are instances of full and permanent memory loss for intoxicated events, whereas the latter are episodes for which retrieval of experiences is facilitated by provision of cues. Beyond this nosological difference, little is known about descriptive dimensions of the two blackout types. The current study assessed their characteristics as reported by a group of heavy drinking young adults. Method: A sample of 136 young adult volunteers (54% male; mean [SD] age = 22.71 [2.23]) were administered a Time-Line Follow-Back assessment, expanded to gather descriptive information about the occurrence and characteristics of en bloc and fragmentary blackouts. Results: Although overall reporting of blackouts by the sample mirrored rates reported in prior research, prevalence and incidence of fragmentary blackouts were more than threefold those of en bloc blackouts. A surprising finding was that the two blackout types exhibited similar range and distribution of corresponding blood alcohol concentrations. Most en bloc blackouts involved concurrent use of illicit substances; polysubstance use was reported for few fragmentary blackouts...

Distinctions in alcohol-induced memory impairment: A mixed methods study of en bloc versus fragmentary blackouts.

Miller, Mary Beth, et al.
Alcoholism: Clinical and Experimental Research, Vol 42(10), Oct, 2018. pp. 2000-2010.

Abstract:

Background: Blackouts—or memory loss for all or part of a drinking event—are reliable predictors of alcohol-related consequences. Studies suggest a distinction between en bloc (complete memory loss) and fragmentary (off-and-on memory loss) blackouts; however, research has not consistently differentiated between these 2 forms of blackout. This study aimed to validate the distinction between en bloc and fragmentary blackouts among young adults. Methods: Data were collected using qualitative (Study 1) and quantitative (Study 2) research methods. Participants in both studies were college students with a history of alcohol-induced memory impairment. They were recruited using community advertisement (Study 1, N = 50, 56% female) and Qualtrics survey panels (Study 2, N = 350, 56% female). Study 1 participants engaged in 8 focus groups. Discussions were audio-recorded, transcribed verbatim, and coded using applied thematic analysis. Findings guided assessment of en bloc and fragmentary blackout in Study 2. In Study 2, a separate sample of participants completed an online survey assessing drinking behavior, alcohol-induced memory impairment, and theoretical correlates of en bloc and fragmentary blackouts. Results: Study 1 participants differentiated between en bloc and fragmentary blackouts (which they referred to as 'blackouts' and 'brownouts,' respectively) based on duration and extent of memory loss. They indicated that blackouts occur along a continuum, with en bloc 'blackouts' at the extreme. They also stated that the term 'blackout drinking' does not always imply memory loss. Study 2 participants reported higher rates of 'brownouts' (81%) than 'blackouts' (54%). They reported less negative outcome expectancies and attitudes, greater personal approval, higher prevalence estimates, lower self-efficacy, and stronger intentions for 'brownouts' than 'blackouts' ($p < 0.001$). Women perceived 'blackouts/brownouts' as more prevalent than men and reported lower intentions to experience 'blackouts' ($p < 0.005$). Conclusions: Young adults are more permissive of fragmentary than en bloc blackout. En bloc blackouts may be a target for future interventions.

Intentions and motives to experience alcohol-induced blackout among young adults in college.

Miller, Mary Beth

Psychology of Addictive Behaviors, Vol 34(6), Sep, 2020. pp. 690-698.

Abstract:

Blackouts are typically considered a negative consequence of alcohol use. Yet some college students report consuming alcohol with the intention of blacking out. This study examined intentions and motives for blackout drinking among young adults in college. College students with a past-year history of blackout (N = 350, 56% female, 73% White) completed an anonymous online survey. Descriptive statistics were used to examine the incidence of blackout intentions, and individuals who did and did not report future blackout intentions were then compared on drinking patterns, depressive symptoms, social norms, and outcome expectancies. Overall, 135 participants (39%) reported consuming alcohol in the past 30 days with the intention of losing memory of the night's events, and 107 (31%) reported blackout intentions in the next 30 days. When asked (via open text box) to indicate their motives for past blackout intentions, the majority of participants provided responses that fit with coping, social, or enhancement drinking motives. A larger proportion of men than women reported blackout intentions. As a group, those reporting future blackout intentions reported heavier, more frequent, and more problematic drinking, as well as more symptoms of depression and more positive (but not negative) outcome expectancies. A substantial subset of college students reporting a blackout in the past year also endorsed intentions to experience a blackout in the next 30 days. Given strong associations between intentions and subsequent behavior, interventions targeting blackout styles of drinking are warranted. The extent to which 'blackout' drinking motives differ from traditional drinking motives is unclear.

How much and how fast: Alcohol consumption patterns, drinking-episode affect, and next-day consequences in the daily life of underage heavy drinkers.

Carpenter, Ryan W et al.

Drug and Alcohol Dependence, Vol 218, Jan 1, 2021. ArtID: 108407

Abstract:

Understanding how alcohol consumption patterns are associated with negative and positive outcomes can inform efforts to reduce negative consequences through modification of those patterns. This is important in underage drinkers, many of whom drink heavily despite negative consequences. Most work has focused on the amount of alcohol consumed, but amount provides limited information about consumption patterns compared to rate of consumption, or how fast individuals drink. We therefore examined associations of both amount and rate of consumption with negative and positive outcomes (immediate affective states and next-morning consequences) in daily life. Method: Ninety-five college students aged 18–20 years completed ecological momentary assessment over 28 days. Participants reported number of standard drinks consumed and positive and negative affect hourly within drinking episodes. Estimated blood alcohol concentration (eBAC) values were used to create amount and rate of consumption indicators. Each morning after drinking, participants reported negative (e.g., blackout, hangover) and positive (e.g., new friend, making others laugh) consequences. Results: Within drinking episodes, multilevel models showed faster consumption was associated with reduced negative affect and both larger amount and faster consumption were associated with greater positive affect. Further, amount and rate were both associated with greater likelihood of a negative consequence the next morning. Rate, but not amount, was associated with more positive consequences.

Conclusions: Not only how much but also how fast individuals drink may be important for the positive and negative outcomes they experience. Interventions to reduce negative alcohol-related outcomes should consider not only amount, but also rate of consumption.