

Social Drinking and Addiction: A Social-Cognitive Model for Understanding
Alcohol Use Disorder Risk

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Abstract

Scientists have long focused on intrapersonal factors and solitary drinking settings in researching addiction etiology. Yet evidence has accumulated to indicate a key role for social contexts in alcohol use disorder development. Here we review four core characteristics of social drinking contexts relevant for the understanding of disordered drinking, including prevalence, developmental timing, negative consequences, and reward value. We present a social-cognitive model aimed at elucidating reinforcement from alcohol in social context, proposing a role for alcohol in inhibiting higher-order cognitive processes that otherwise dampen the experience of social reward. Finally, we review a series of empirical studies providing evidence for the role of social context in alcohol use disorder development, highlighting methodological challenges and indicating directions for future research.

Keywords: Alcohol, addiction, social, context, drugs

“The culture of drink endures because it offers so many rewards: confidence to the shy, clarity for the uncertain, solace to the wounded and lonely, and above all, the elusive promises of friendship and love”

—Pete Hamill, *A Drinking Life: A Memoir*

What does disordered drinking look like, and how does it develop? In answer, you might picture a person sitting alone, with only a gin bottle for company: an individual set apart, robbed in many ways of the emotional and motivational tapestry at the core of what is human.

At the same time another picture of drinking exists. Imagine a person surrounded by companions, ending the day in conversation with friends: a person driven by desires as intrinsically human as social communion, freedom from pain, and the pursuit of joy.

As a drug that exists both inside and outside social respectability, alcohol has long been a substance split in two. One drink is a joiner of souls, elixir of laughter, and a bringer of joy to the humdrum of everyday existence. The other isolates drinkers from family and friends, destroys reason, and imperils our most fundamental of human traits. In seeking to understand alcohol-related harms and alcohol use disorder (AUD), scientists have overwhelmingly considered the latter of these pictures. But evidence for the centrality of social motives in problem drinking surrounds us. Social drinking represents both a pathway towards the development of AUD, as well as a primary site for its manifestation. Here we present a body of work aimed at squarely facing the fundamentally human and often deeply communal motives that can drive not only

moderate but also hazardous consumption, with the aim of building a broader and more precise understanding of pathways to AUD.

Drinking Alone

A variety of litmus tests have been proposed to differentiate acceptable from unacceptable alcohol use: colloquial accounts pinpoint markers ranging from day-drinking to stress-drinking, governments designate age restrictions, and medical associations endorse maximum weekly drink counts. Among these indicators, however, few have captured public attention as emphatically as has the criteria of “drinking alone” (Fairbairn & Velia, 2019). In popular culture, self-help gurus and magazine quizzes have long diagnosed problem drinking based on solitary consumption. Within the realm of AUD research, basic scientific studies of the solitary drinker outnumber studies of the social drinker by factor of nearly ten-fold (Creswell & Fairbairn, In Press; see Figure 1), and theories of problem drinking seek to explain alcohol use disorder via broadly asocial mechanisms (Cooper et al., 1995). Such assumptions have even entered our most basic vocabulary, with the term “social drinker” used synonymously with non-problem drinker across scientific and colloquial discourse (Fairbairn & Sayette, 2014).

Drinking alone is not the only solitary endeavor historically viewed askance. As is evident in sayings such as “sunlight is the best disinfectant,” observation by others has long been considered as exercising an important check on deviant behaviors. In contrast, solitary activities as seemingly benign as silent reading have been looked on with suspicion at various points in human history (Knox, 1968). Of note, the assumption that the mere presence of others exerts a beneficial effect on behavior may be attractive in part

because of its potential to relieve us of a sense of social accountability. For example, when applied in the domain of alcohol, such associations leave social drinkers free to enjoy the pleasures of drinking knowing others less fortunate are set firmly apart, unaffected by our public behaviors and independently responsible for their problems (Krendl & Perry, 2023).

Importantly, associations between solitary drinking and AUD have received empirical support, at least to a certain extent. First, individuals with more severe forms of AUD display a range of atypical, stereotyped symptoms including a blunted emotional landscape, "irrational" action patterns, and a tendency to drink in solitary contexts when compared to lighter drinkers (Bourgault & Demers, 1997; see Skrzynski & Creswell, 2020 for a review). Second, drinking alone during adolescence has been identified as one powerful predictor of the later development of AUD (Creswell, 2021). Finally, in cases where members of social drinking groups diverge in consumption patterns, such groups have the potential to serve a protective function, offering mutual support to offset negative alcohol-related consequences (e.g., the "designated driver" role; Ditter et al., 2005).

Although it is understandable that public attention has been drawn to more severe AUD manifestations, such a focus ignores use patterns responsible for the majority of alcohol-related societal harms. A far larger proportion of individuals meet criteria for mild or moderate AUD than severe (Lane & Sher, 2015; See Figure 2). Further, considered both in aggregate and (by some metrics) per capita, more societal harms accrue to those identified as non-disordered heavy drinkers than to individuals with

severe AUD (Borges et al., 2006; Yao et al., 2018). Therefore, similar to the tendency for plane crashes to steal the headlines while car wrecks pass largely unmarked, a disproportionate amount of attention across both scientific and popular discourse has been drawn to the most severe (and least prevalent) manifestations of AUD (Larimer et al., 1998). Second, regarding longitudinal associations between drinking alone and AUD, a wide range of third variables link those who elect into solitary consumption and those at risk for problem drinking, ranging from social deviance to negative affectivity to impulse-control disorders (Bourgault & Demers, 1997). In short, while solitary drinking might serve as a useful early indicator of AUD risk, evidence points to its role being one of correlate and not cause. Finally, although it is certainly possible for social drinking groups to mitigate harm from alcohol through mechanisms of mutual support, a perspective that considers only protective effects disregards the powerful influence of modelling and social selection. Heavy drinkers tend to seek out other heavy drinkers for company (Leung et al., 2014). In such contexts exacerbation is as likely as mitigation and, in line with this premise, research suggests that individuals reliably consume more alcohol in social context than when alone (Fairbairn & Sayette, 2014). Therefore, while in some cases social observation may provide a form of “disinfectant,” such maxims lose their value when applied to settings involving substance use. In such instances, intoxication levels among observers frequently matches those under observation, and the “sunlight” of social attention is overcast.

Drinking in Company

Social settings are not just another context when it comes to alcohol consumption. According to some interpretations of the "beer before bread" theory of human evolution, it was the combination of alcohol and social context that facilitated the transition to agrarian civilization, for the first time permitting peaceful cohabitation within the relatively large and stable social groups required for crop domestication (Slingerland, 2021). Social settings also represent a context of critical relevance to the understanding of AUD. Reasons for such centrality abound but might be best summarized in four core characteristics: 1) **Prevalence:** Humans are fundamentally social beings (Baumeister & Leary, 1995). Based on aggregate cross-study estimates, approximately 87% of drinking contexts among non-problem drinkers, and 76% among problem drinkers, are social contexts (see Figure 1). Thus, social drinking contexts merit attention as the setting in which most alcohol consumption takes place (Fairbairn & Sayette, 2014); 2) **Development and Timing:** Drinking in company is particularly common during life epochs of adolescence and young adulthood (Creswell, 2021). All but a vanishingly small minority of drinking initiation and subsequent early drinking episodes take place in social context (Warner & White, 2003). As such, even among the subset of individuals who ultimately go on to do much of their drinking alone, their "formative" experiences with alcohol almost always involved company (Creswell, 2021); 3) **Consequences:** Some of the most serious negative consequences from alcohol use are linked specifically with social consumption. In particular, alcohol-related violence, risky sex, and extreme binge drinking are all primarily or exclusively social-drinking phenomena (Fairbairn & Sayette, 2014; Fairbairn & Velia, 2019). Similarly, alcohol-related traffic fatalities would plunge were everyone content to drink at home in solitude (Fairbairn & Velia, 2019).

A final characteristic of social drinking that is also central to the understanding of AUD is **Reward**. People drink alcohol for a reason—typically, because they like the way it makes them feel (Cooper et al., 1995). In line with neurobiological theories of the addiction cycle (Koob & Volkow, 2016), as well as adaptations of this model to inform Addictions Research Domain Criteria (Witkiewitz et al., 2019), reward and reinforcement mechanisms represent key factors motivating substance use, particularly in the early stages of addiction characterized by use initiation and escalation. Notably, evidence from both randomized laboratory and also field studies indicate that emotional rewards from alcohol are significantly more pronounced in social as opposed to solitary context (Fairbairn, Bresin, et al., 2018; see Fairbairn & Sayette, 2014 for a review). As such, while solitary drinking has captured public attention as a powerful AUD correlate, social contexts hide in plain sight as a setting highly conducive to alcohol reinforcement and therefore relevant to a mechanistic (i.e., causal) understanding of AUD development.

These findings beg the question—what is it about the combination of social context and alcohol consumption that creates such a powerful brew? Figure 3 presents an updated account of our Social-Cognitive Model of alcohol reinforcement and AUD risk (see Fairbairn & Sayette, 2014 for original model). Integrating insights across theoretical models of alcohol's effects, this framework indicates two broad classes of context that reliably produce alcohol-related reinforcement, each of which can be understood through a cognitive lens. First, alcohol has the tendency to impair attention, diminishing capacity for divided focus and thus narrowing attention to immediate environmental cues (Steele & Josephs, 1990). As such, contexts featuring immediate pleasurable stimuli can generate potent alcohol-related rewards. Second, alcohol has the potential to mitigate negative

emotions specifically linked with higher-order cognitive processes, including self-directed and abstract future thought (Hull, 1981; Moberg & Curtin, 2009; Steele & Josephs, 1990). Thus, contexts that recruit such higher-order cognitive abilities—fostering self-awareness (Hull, 1981) and concern over uncertain future threat (Moberg & Curtin, 2009)—have been linked to alcohol-related reward. Importantly, in our Social-Cognitive Model, we propose that social settings lie at the intersection of these context classes, offering the potential for pleasure as well as cognition-fueled pain (Fairbairn & Sayette, 2014). Social interactions provide a deep well of potential enjoyment, presenting opportunities for the satisfaction of fundamental human needs, including the need to belong. In tandem, and likely inseparable from their potential for pleasure, social contexts carry risks across a variety of domains, including possible threats to self-concept, social standing, and even physical well-being (Baumeister & Leary, 1995; Leary et al., 1995). As such, the enjoyment of social spaces often lies just beyond our grasp—we glimpse the potential for pleasure, but only vaguely beyond a cognition-fueled static of self-awareness, inattention, and preoccupation with future unknowns (Fairbairn & Sayette, 2014). Alcohol enhances social interaction by lifting this curtain of cognition-fueled worry and distraction, freeing resources for social engagement and reward (Figure 3).

Empirical Research

A growing body of empirical work provides support for the importance of social contexts in the understanding of AUD risk. Findings from research combining baseline laboratory alcohol-administration and longitudinal follow-up suggest that individuals who experience greater (vs. lesser) positive mood and social enhancement from alcohol

in a group-based consumption context are more likely to experience drinking problems 18-months later (Venerable & Fairbairn, 2020). Experimental studies integrating communal consumption contexts indicate enhanced sensitivity to alcohol's social rewards among individuals at higher vs. lower risk for AUD (see Fairbairn & Velia, 2019), while evidence from both laboratory and field-based studies indicate that features of social drinking contexts (e.g., social familiarity, social group size) predict alcohol reinforcement and hazardous drinking (Ariss et al., In Press; Fairbairn, Bresin, et al., 2018; Gurrieri et al., 2021). In research exploring close relationships, empirical findings indicate that problems in relationships temporally precede the onset of problem drinking (Fairbairn, Briley, et al., 2018), AUD interventions integrating social relationship enhancement units outperform individual-level interventions by a significant margin (Ariss & Fairbairn, 2020), and dissatisfied couples gain greater social enhancement from consuming alcohol than satisfied couples (Fairbairn & Testa, 2017). Considered together with a larger body of evidence connecting social motives with drinking (Fairbairn & Velia, 2019), these findings put forward the possibility that individuals may turn to alcohol to address difficulties in social relationships. In sum, research suggests that social rewards from drinking, long considered foremost among alcohol's *prized* effects, also carry implications for understanding alcohol's *darker* properties.

While the empirical research literature continues to grow, studies of social contextual mechanisms of AUD risk remain relatively few. One potential barrier to work in this domain is that of methodology. Twin challenges of subjectivity and complexity have long impacted the study of context (Fairbairn, Bresin, et al., 2018; Sayette et al., 2012). There is no biological assay for measuring all that goes on around us. Concerns

surrounding subjectivity have been especially pronounced with respect to the assessment of social reward, where constructs such as social bonding and relationship quality can elude objective operationalization. Thus, it is possible that most prior research on AUD risk has examined people drinking alone because studying people in company is exceptionally hard (Sayette et al., 2012). Yet here new measurement and analytic tools offer promise. Group-based alcohol-administration procedures have been developed for capturing causal effects of alcohol on social outcomes (Fairbairn, Bresin, et al., 2018; Sayette et al., 2012), while computer-vision based techniques can provide an objective view of complex emotional and social outcomes in these groups (e.g., proxemics, natural language processing) (Gurrieri et al., 2021). Novel biosensors offer the potential for the objective assessment of drinking in social contexts outside the lab (Fairbairn & Bosch, 2021), while image-based analysis can index characteristics of real-world drinking environments (Fairbairn, Bresin, et al., 2018). Finally, machine learning methods permit prediction via algorithms integrating multiple predictors and their combinations, so modeling complex interacting influences on drinking within social environments (Fairbairn & Bosch, 2021). In sum, while capturing social elements of alcohol's effects inevitably represents a challenge, an expanding methodological toolkit offers opportunities for future research.

Conclusion

The past decade has seen growing acceptance of alternative legal uses of previously illicit substances. As marijuana is embraced for its benign and sometimes therapeutic effects, and microdosing of psychedelics gains popularity, we will

increasingly seek a means of differentiating between healthy and harmful consumption across a range of substances. No threshold will be universally “true,” while some divisions will nonetheless have utility. As an addictive drug that enjoys an extraordinary level of integration into human social life, alcohol foreshadows legal and medical dilemmas ahead.

Social drinking has long been accepted as a dividing line separating healthy from hazardous alcohol use. The assumption that social drinking nourishes, while solitary drinking pollutes, exists despite both theory and scientific evidence emphasizing the centrality of social factors in *both* problematic and nonproblematic consumption. As reviewed here, although solitary drinking can represent a sign of problem drinking, social drinking may also undergird the development of such problems. We purchase each form of alcohol—the communal, cohesive, and corrosive—at the cost of the other. The question of whether that cost is ultimately too high is not one with a simple answer.

Recommended Reading

Fairbairn, C. E., & Sayette, M. A. (2014). A social-attributional analysis of alcohol response. *Psychological Bulletin*, *140*(5), 1361–1382.

<https://doi.org/10.1037/a0037563>

- A review and meta-analytic exploration of mechanisms through which social contexts engender alcohol reward.

Fairbairn, C. E., Briley, D. A., Kang, D., Fraley, R. C., Hankin, B. L., & Ariss, T. (2018). A meta-analysis of attachment security and substance use. *Psychological Bulletin*, *144*(5), 532–555. <http://dx.doi.org/10.1037/bul0000141>

- A review and meta-analytic examination of links between trait-level social deficits and substance use problems.

Gurrieri, L., Fairbairn, C. E., Sayette, M. A., & Bosch, N. (2021). Alcohol narrows physical distance between strangers. *Proceedings of the National Academy of Sciences*, *118*(20), e2101937118. <https://doi.org/10.1073/pnas.2101937118>

- An experimental examination of social-contextual moderators of alcohol reward using computer vision methods for assessing behavioral outcomes.

Sayette, M. A., Creswell, K. G., Dimoff, J. D., Fairbairn, C. E., Cohn, J. F., Heckman, B. W., Kirchner, T. R., Levine, J. M., & Moreland, R. L. (2012). Alcohol and group formation: A multimodal investigation of the effects of alcohol on emotion and social bonding. *Psychological Science*, *23*(8), 869–878.

<https://doi.org/10.1177/0956797611435134>

- A large-scale experimental examination of alcohol's rewarding effects in groups.

Creswell, K. G., & Fairbairn, C. E. (In Press) The need for multi-participant alcohol administration studies. *Addiction*.

- An editorial and meta-analysis examining the prevalence of social settings in alcohol-administration studies vs. real-world settings.

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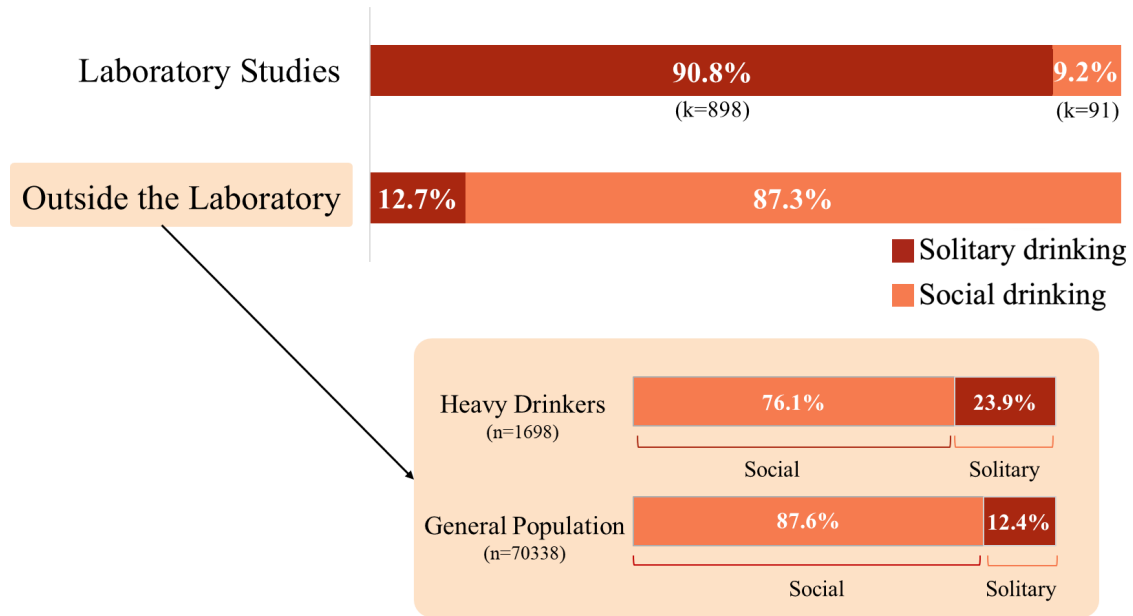
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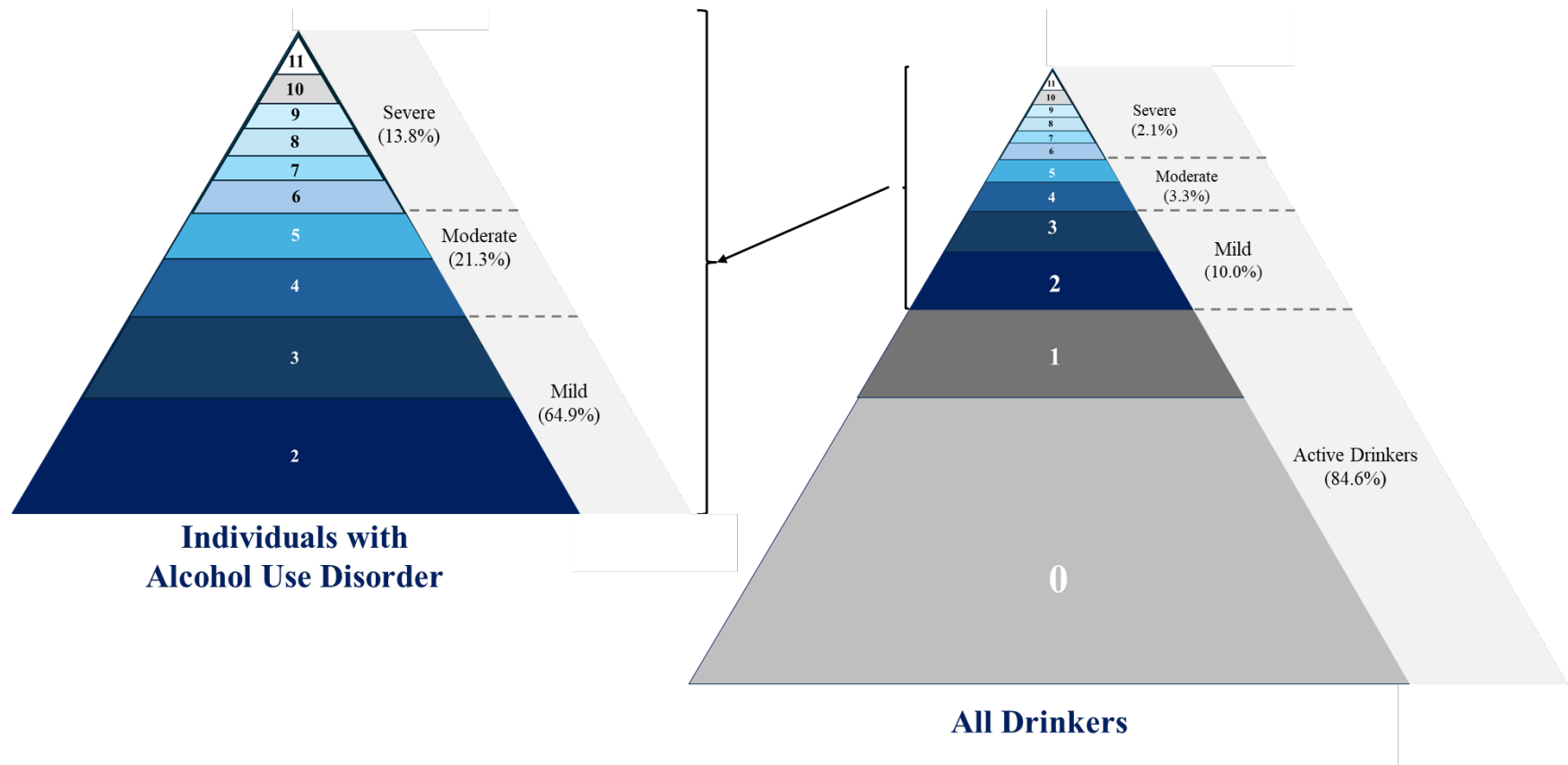
Figure 1. Solitary and social drinking contexts as represented in laboratory studies vs. real-world drinking settings



Note: The top graph displays the proportion/number of laboratory alcohol-administration studies that have employed social vs solitary examination contexts. The bottom graph displays proportions of social vs. solitary drinking contexts as represented in the real-world, outside the laboratory, including among general populations and samples specifically consisting of heavy drinkers. See Creswell & Fairbairn (In Press) and supplemental materials

https://osf.io/y7tzc/?view_only=76ba1969831848aebbd3ecbc468ac427 for full results.

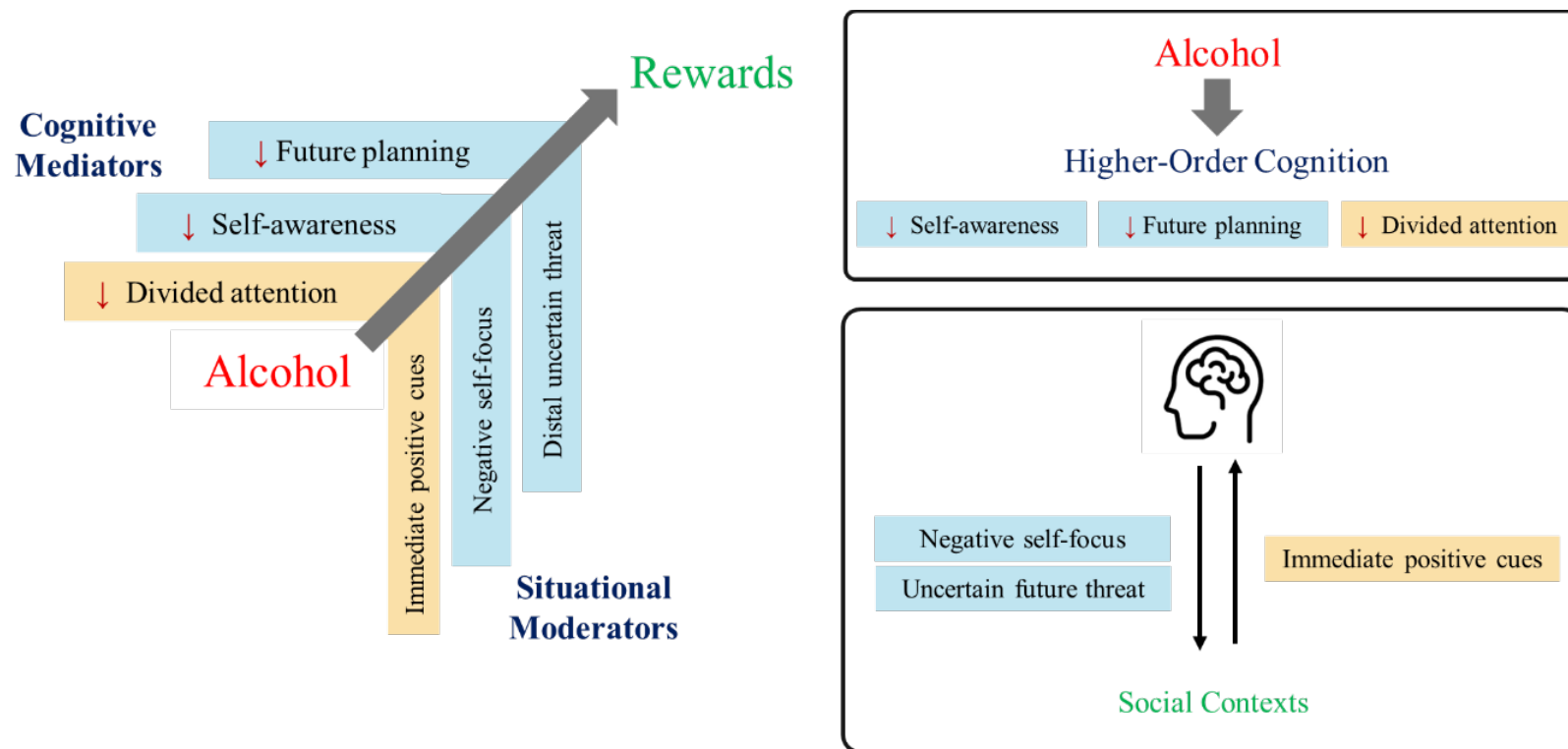
Figure 2. Prevalence of alcohol use disorder (AUD), mild-moderate-severe AUD severity levels, and variable symptom counts



Note: Data drawn from the 22,177 active drinkers who comprised Wave 2 of the National Epidemiological Survey on Alcoholism and Related Conditions (NESARC). Numbers reflect symptom counts according to *DSM-5* Alcohol Use Disorder diagnostic criteria (0-11). The area of each

triangle segment is proportional to the percentage of the sample who endorsed a given number of symptoms and/or met criteria for given AUD severity level. See also Lane and Sher (2015).

Figure 3. The Social-Cognitive Model of Alcohol Reinforcement



Note: This figure illustrates two contexts for alcohol-related reinforcement: contexts featuring immediate pleasurable stimuli and those that recruit higher-order cognitive processes. Alcohol narrows attention to immediate stimuli, generating positive emotion in situations featuring salient pleasurable cues. Alcohol further dampens negative emotions linked to higher-order cognition, improving mood in contexts likely to trigger self-awareness and anxiety over uncertain future threat. Social settings lie at the intersection of these, offering potential pleasure too often dampened

by cognition-fueled pain. Alcohol enhances social interactions by diminishing higher-order cognitive capacity that can facilitate divided attention, self-awareness, and concern over abstract future outcomes, so reducing cognitive burden and freeing resources for engagement with social rewards.