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## Effects of Alcohol on Human Aggression

Dominic J. Parrott<sup>a</sup> and Christopher I. Eckhardt<sup>b</sup>

<sup>a</sup>Dominic J. Parrott, Department of Psychology, Georgia State University, P.O. Box 5010 Atlanta, GA 30302-5010

<sup>b</sup>Christopher I. Eckhardt, Department of Psychological Sciences, Purdue University, West Lafayette, IN 47907

### Abstract

There is little debate that alcohol is a contributing cause of aggressive behavior. The extreme complexity of this relation, however, has been the focus of extensive theory and research. And, likely due to this complexity, evidence-based programs to prevent or reduce alcohol-facilitated aggression are quite limited. We integrate I<sup>3</sup> Theory and Alcohol Myopia Theory to provide a framework that (1) organizes the myriad instigatory and inhibitory factors that moderate the effect of alcohol on aggression, and (2) highlights the mechanisms by which alcohol facilitates aggression among at-risk individuals. This integrative framework provides the basis for understanding the appropriate targets for prevention and intervention efforts and may serve as a catalyst for future research that seeks to inform intervention development.

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Alcohol is a contributing cause of aggression. Empirical support for this conclusion is extensive and includes numerous quantitative and qualitative literature reviews [1, 2, 3, 4]. However, alcohol's effect on aggression varies as a function of individual- and situational-based instigating and inhibiting factors. Indeed, a recent "meta-meta-analysis" of 32 meta-analytic studies which reviewed experimental, case-control, cross-sectional, and longitudinal studies showed that the effect of alcohol on aggression was medium ( $d = 0.39$ ) [••5]. These data support the recent conclusion that research must move beyond whether alcohol causes aggression and instead identify "the critical and most potent instigating and inhibiting factors" (p. 8) for alcohol-related aggression, so that interventions can be directed at these fundamental determinants [6]. As such, the present chapter outlines an integrative theoretical framework of that invokes (1) a "meta theory" (I<sup>3</sup> Theory: [••7, 8]) to organize instigatory and inhibitory factors, and (2) a proximal process theory (Alcohol Myopia Theory: [9]) to explain the mechanism by which proximal alcohol use facilitates aggression as a function of individual differences in those factors. This framework serves as the basis for prevention and intervention recommendations.

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\*\*Correspondence concerning this article should be addressed to Dominic J. Parrott, Department of Psychology, Georgia State University, P.O. Box 5010, Atlanta, Georgia 30302-5010. parrott@gsu.edu.

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## Modeling Alcohol-Aggression Etiology: Instigating, Impelling, and Inhibiting Factors

I<sup>3</sup> Theory (“I-Cubed”) is a multifactorial meta-theory that predicts myriad behaviors, including aggression [••7, 8]. Like other meta-theoretical approaches, such as the General Aggression Model [10], I<sup>3</sup> Theory does not restrict the prediction of aggression to one decisive risk factor (or set of factors) or to one particular theoretical level of analysis. Rather, I<sup>3</sup> Theory suggests that we can predict whether a given social interaction will result in aggression if we can discern the strength of *Instigation*, degree of *Impellance*, and presence of *Inhibitory* factors. Once these factors are organized into the I<sup>3</sup> framework, their effects on aggression as well as their interactions with other relevant risk factors can be examined.

*Instigating* factors normatively produce an urge to behave aggressively (e.g., provocation). These factors provide the initial momentum toward an aggressive action that represents the availability of an aggressive response. Of course, availability of an aggressive response does not mandate its enactment. People are exposed to instigating influences every day, but few actually lead to aggression. Thus, other factors are necessary to determine whether someone will perpetrate aggression at a specific point in time. *Impelling* factors are dispositional and/or situational factors that psychologically prepare an individual to experience a strong urge to aggress in the presence of an instigating factor. Just like a pool of gasoline will not ignite without an incendiary device, instigating and impelling factors interact to create an individual’s “*urge-readiness*,” or the likelihood that the person will experience a strong inclination to act aggressively in that particular context. For example, a person with high trait anger is prone to aggression [11], but contextual or situational instigators must first provide the initial urge towards aggression. *Inhibitory* factors increase the likelihood that a person will be able to resist an urge to behave aggressively in the presence of a given instigatory cue. Inhibiting factors set the threshold beyond which aggressive urges would result in aggression. The integrity of these inhibitory capabilities may be compromised by various *disinhibiting* influences, which decrease the effectiveness of inhibitory efforts and, therefore, decrease the likelihood that a person will be able to resist an aggressive urge. A variety of disinhibiting cognitive processes support the “moral disengagement” that accompanies destructive human behavior, including alcohol intoxication [12, •13, ••14]. The difference between inhibiting and disinhibiting influences constitutes a person’s “*urge-impedance*,” or the overall ability of an individual to inhibit an aggressive inclination.

An advantage of using I<sup>3</sup> Theory to understand the effects of alcohol on aggression rests in its interactional framework. The theory suggests that we may enhance predictions of whether a given social interchange will result in aggression if we can discern the strength and patterning of instigation, impellance, and inhibition/disinhibition factors. For instance, one laboratory-based study found that high trait anger (high impellance) was associated with higher aggression in response to provocation (strong instigation), but only among men who were intoxicated (high disinhibition) and reported low levels of anger control (low inhibition) [15]. This finding represents a prime application of the I<sup>3</sup> interactional framework and how knowledge of the interplay among these three processes may be both *necessary and sufficient* for predicting alcohol-facilitated aggression.

## Proposed Mechanisms of Alcohol-Facilitated Aggression

I<sup>3</sup> Theory provides the organizational framework to develop clear and testable models of alcohol-aggression etiology. Because of its theoretical inclusiveness, process-based theories can then be brought to bear to examine how hypotheses related to risk can be translated into process-oriented mediation models. For example, while research has established that alcohol is more likely to cause aggression when the perpetrator is provoked (*Instigation*) and possesses particular aggressogenic traits (*Impellers*), it is also clear that the pathway from instigators and impellers to aggressive outcomes depends on the balance provided by the presence of *Inhibitory* factors [6, 16]. Thus, alcohol does not unilaterally impel acts of aggression via direct pharmacologic manipulation; rather, alcohol intoxication produces key neuropsychological changes that alter executive functioning and impede self-regulatory capacities in ways that tip the balance towards an aggressive response [••14].

To this end, the effect of alcohol on aggression is most frequently interpreted from the etiologic standpoint of Alcohol Myopia Theory [9]. According to Alcohol Myopia Theory the pharmacological properties of alcohol narrow attentional focus, restrict the cues individuals perceive, and reduce individuals' capacity to process meaning from information they do perceive. As a result, intoxicated individuals allocate their attention such that they perceive and process only the most salient cues of a situation (e.g., a verbal insult) to the exclusion of less salient inhibitory cues (e.g., legal consequences of aggression). Alcohol Myopia Theory has garnered ample empirical support [••14]. Laboratory data suggest that alcohol use increases or decreases aggression depending upon whether attention is manipulated toward cues that promote (e.g., provocation) or inhibit (e.g., non-aggressive norms) aggression, respectively. For instance, distraction from provocative cues reduces physical aggression among intoxicated men [17, 18]. Meta-analytic reviews evidence smaller effect sizes of alcohol on aggression when participants are distracted [1]. Cross-sectional studies suggest that heavy drinking is associated with aggression primarily among hostile individuals who endorse dispositional tendencies towards aggression-related cognitive biases [19] or who are susceptible to alcohol-related shifts in attention toward provocative cues [20]. Accordingly, prior research has demonstrated that individuals at risk for aggression show attentional biases towards aggression-relevant contextual stimuli [21, 22]. It therefore follows from Alcohol Myopia Theory that alcohol use may potentiate aggression by narrowing attention onto salient, provocative cues. However, individuals surely differ in what they perceive to be salient as well as in their dominant response to a given salient cue. Thus, this putative mechanism is posited to be especially relevant in high-risk individuals. While prior research has examined the moderating effects of information processing biases [23], the mediational attention allocation hypothesis assumed to underlie the alcohol-aggression association has received scant empirical attention [17].

Alcohol Myopia Theory also makes the counterintuitive prediction that alcohol intoxication can actually decrease aggression, even below that of sober individuals. Specifically, in a situation where non-provocative cues are most salient, the narrowed attentional capacity of the inebriate will be focused on those cues, leaving little space in working memory to focus on less salient provocative cues. In contrast, sober persons in the same situation possess enough working memory to allot attention to provocative and non-provocative cues, thus

increasing their risk of aggression above that of intoxicated persons. Data support this counterintuitive prediction [17, 18, 24, 25, 26], which carries compelling implications for interventions designed to prevent alcohol-related aggression [27]. And, consistent with hypothesized individual differences in susceptibility to alcohol-induced myopia, research suggests that impelling and inhibitory factors moderate intoxicated men's receptiveness to manipulations designed to focus their narrowed attentional capacity onto inhibitory cues [25, 26].

Although it is clear that Alcohol Myopia Theory is a well-supported model that fleshes out the inhibitory process dimension of I<sup>3</sup> Theory, the intervening processes by which attentional biases increase (or decrease) the probability of aggression remain largely unstudied. To address this gap, pertinent theory [14] posits that alcohol-induced attention towards provocation produces (1) general negative affect that may subsequently generate a refined affective state of anger, (2) excessive hostile rumination about the provocation, the transgressor, and/or the behavioral responses required to resolve the provocative situation, and (3) reductions in self-awareness. Studies indicate that aggression is more likely when these more proximal processes are induced [28, 29, 30], which is further supported by studies that directly examine alcohol effects (anger: [31, 32, 33]; hostile rumination: [34, 35]; self-awareness: [25, 36]). Collectively, these findings suggest that alcohol-induced attentional biases may increase aggression risk by (1) concentrating attentional processes on angry affect and the hostile transgression, and (2) compromising attentional processing of internal standards and situational norms, which will increase the likelihood that intoxicated behavior does not appropriately match situational, non-aggressive norms.

## Prevention and Intervention

The integration of I<sup>3</sup> Theory and Alcohol Myopia Theory provides a heuristic framework to understand (1) the cognitive, affective, and behavioral risk factors for alcohol-facilitated interpersonal aggression, and (2) theoretically-relevant mechanisms of aggression. Collectively, accounting for key instigatory and inhibitory factors as well as multiple mechanisms of alcohol-facilitated aggression within a parsimonious framework provides the foundation for the construction of effective treatments to prevent alcohol-facilitated aggression. Use of this framework provides the opportunity to identify “the critical and most potent instigating and inhibiting factors” (p. 8) for alcohol-related aggression, so that interventions can be directed at these fundamental determinants [6].

Unfortunately, evidence-based programs to prevent or reduce alcohol-facilitated aggression are quite limited. Existing approaches attempt to decrease aggression by preventing or reducing the individual's alcohol use or by a combined intervention focus on both alcohol use and aggression. Evidence supports the efficacy of these approaches [37, 38, 39, 40], although there remains an unmet need for individual-level interventions that employ an integrated focus on aggression and alcohol use [41]. Even if treatment for an alcohol use disorder was deemed a first-line intervention for aggression, many patients do not achieve sustained abstinence. Thus, research that examines interventions which are applied *during* episodes of acute intoxication are needed [14, 17, 27]. Grounded in Alcohol Myopia Theory, proposed interventions call for the use of highly salient and easy-to-process

inhibitory cues that will redirect the inebriate's attention away from hostile provocative cues. With a focus on such cues, cognitive (e.g., low self-awareness, hostile cognitions) and emotional variables (e.g., anger) associated with aggression should be attenuated. The idea of manipulating attention via implementation of cues that deter violence or enhance self-awareness carries potential but has yet to be rigorously tested, particularly in real-world settings.

Prevention efforts can also be directed at the potential impact of *bystanders*, who are oftentimes present in interpersonal violence situations [42]. The bystander approach to violence prevention aims to prepare individuals to intervene when they witness situations that involve or could potentially lead to aggression. This approach has been identified as a promising strategy to prevent sexual violence [43] and intimate partner violence [44]. Unfortunately, this work does not account for the role of alcohol use. For instance, campus sexual violence often occurs at or after attending bars or parties where attendees drink alcohol [45, 46, 47], and alcohol-facilitated aggression in bars and other public venues is also highly likely to occur in the presence of bystanders. Yet, only one study [48] has examined the likelihood of bystander intervention in a drinking context but was unable to determine if the bystanders, perpetrator, or victim had consumed alcohol.

## Conclusion

There is little debate on several fundamental points: (1) The pharmacological effects of alcohol cause aggressive behavior; (2) the alcohol-aggression relationship is exceedingly complex, as evidenced by myriad moderating variables and various putative mechanisms by which aggression is facilitated in at-risk individuals and/or situations; and (3) Effective interventions that break this robust and complicated association are limited. The proposed integrative theoretical framework can bring greater clarity to this complex association such that intervention-based research and public health programming can more effectively address this critical public health problem.

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- of outstanding interest

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### Highlights

- An integrative framework for alcohol-facilitated aggression is reviewed.
- Evidence is presented to support this framework of alcohol-aggression etiology.
- This framework organizes factors that may serve as targets for intervention.

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