



# Caffeinated and non-caffeinated alcohol use and indirect aggression: The impact of self-regulation



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## HIGHLIGHTS

- Tested associations between alcohol and caffeinated alcohol and indirect aggression.
- Self-regulation moderated study relationships.
- Regulation strengthening techniques are suggested for college at-risk drinkers.

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## ABSTRACT

Research shows that heavier alcohol use is associated with physical aggression. Scant research has examined the way in which alcohol relates to other forms of aggression, such as indirect aggression (e.g., malicious humor, social exclusion). Given the possible negative consequences of indirect aggression and the limited evidence suggesting alcohol use can elicit indirectly aggressive responses, research is needed to further investigate the association between drinking behavior and indirect aggression. Additionally, specific alcoholic beverages, such as caffeinated alcoholic beverages (CABs; e.g., Red Bull and vodka), may potentiate aggression above the influence of typical use, and thus warrant examination with regard to indirect aggression. One factor that may impact the strength of the alcohol-indirect aggression and CAB-indirect aggression relationships is one's level of self-regulation. Consequently, our study examined the relationships between (1) alcohol use and indirect aggression, (2) CAB use and indirect aggression, and (3) self-regulation as a moderator. Participants were 733 (67.6% female) undergraduate students who reported their CAB and alcohol use, self-regulation, and aggressive behaviors. Results revealed that heavier alcohol use was associated with more frequent indirect aggression after controlling for dispositional aggression. Heavier CAB use was related to more frequent indirect aggression after accounting for typical use and dispositional aggression. Self-regulation moderated these associations such that for those with lower self-regulation, greater alcohol and CAB consumption was associated with greater indirect aggression. Our findings suggest that heavier alcohol and CAB consumption may be risk factors for engaging in indirect aggression and this risk is impacted by one's regulatory control.

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## 1. Introduction

The relationship between alcohol and physical and verbal aggression, is well established (e.g., Eckhardt & Crane, 2008; Giancola, 2002; Giancola, Godlaski, & Parrott, 2005; Giancola, Godlaski, & Roth, 2012; Smucker Barnwell, Borders, & Earleywine, 2006). Limited research, however, has examined associations between drinking and indirect aggression. Indirect aggression refers to harm delivered to a victim via mediating persons or events (e.g., social exclusion, guilt induction, malicious humor; Archer &

Coyne, 2005; Bjorkqvist, Osterman, & Kaukiainen, 1992) and focuses on the exclusion and degradation of social standing. Given potential adverse effects of indirect aggression (e.g., depression, somatic complaints; Baldry, 2004), a more in-depth understanding of indirect aggression and its relationship with alcohol use is warranted. Also, there is a need for research examining the link between indirect aggression and caffeinated alcoholic beverages (CABs), as consumption of such beverages is linked with heightened levels of physical aggression (Jones, Barrie, & Berry, 2012; Woolsey, Waigandt, & Beck, 2010). Self-regulation theory (Baumeister, Gailliot, DeWall, & Oaten, 2006; DeWall, Baumeister, Stillman, & Gailliot, 2007) suggests that individuals who are less able to regulate their behavior are less capable of resisting urges such as behaving aggressively. Thus, it is possible that the association between alcohol (i.e., non-caffeinated alcohol beverages) and CAB use with indirect aggression may be dependent

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upon one's ability to control their thoughts, behaviors, and impulses. Consequently, the present study explored the relationships between alcohol and CABs and indirect aggression, as well as the potential moderating role of regulatory control.

### 1.1. Indirect aggression

Indirect aggression has been shown to negatively impact the recipient's mental health, with victimization being related to greater levels of depression, anxiety, and suicidal ideation (Archer & Coyne, 2005; Miller & Vaillancourt, 2007). Among middle school students, indirect victimization, rather than direct victimization, was a stronger predictor of internalizing symptoms, including somatic complaints and depression (Baldry, 2004). Being a victim of indirect aggression also predicts greater likelihood of responding with aggression (Owens, Slee, & Shute, 2000; Twenge, Baumeister, Tice, & Stucke, 2001); thus promoting a pattern of aggressive reacting.

Although limited, experimental research suggests that engagement in indirect aggression is related to alcohol use and alcohol-related constructs (Friedman, McCarthy, Bartholow, & Hicks, 2007; Subra, Muller, Begue, Bushman, & Delmas, 2010). Specifically, research has demonstrated that exposure to alcohol-related words and images (e.g., beer, vodka) may elicit indirectly aggressive responses. For example, participants exposed to alcohol-related cues provided more negative ratings of an experimenter as opposed to participants exposed to non-alcohol-related cues (Friedman et al., 2007; Subra et al., 2010). Despite some experimental support, several questions remain regarding the relationship between indirect aggression and alcohol use. Specifically, research has yet to investigate the way in which typical drinking behavior is associated with self-reported history of indirect aggression. Given the adverse effects of indirect aggression, particularly the potential for subsequent aggression (Owens et al., 2000; Twenge et al., 2001), such information would provide valuable insight regarding potential precursors of indirect aggression as well as whether the likelihood of indirect aggression increases as alcohol is consumed.

### 1.2. Caffeinated alcohol

Caffeinated alcoholic beverages (CABs; e.g., Red Bull and vodka) are commonly consumed among college students, with 75% consuming CABs in their lifetime (Berger, Fendrich, & Fuhrmann, 2013) and 24% in the past month (O'Brien, McCoy, Rhodes, Wagoner, & Wolfson, 2008). Despite its popularity, CAB use is particularly associated with engagement in risky behaviors (see Linden & Lau-Barraco, 2014 for a review). Experimental research suggests that consumption of CABs subjectively reduced drinkers' feelings of intoxication without reducing cognitive and behavioral impairment (Ferreira, De Mello, Pompéia, & Souza-Formigoni, 2006; Marczynski & Fillmore, 2006). Consequently, CAB consumption is related to heavy episodic drinking, riding in a car with someone under the influence of alcohol, risky sexual behaviors (O'Brien et al., 2008), and stimulant drug use (Brache & Stockwell, 2011; Snipes & Benotsch, 2013). Overall, CAB use may reduce perceptions of intoxication, resulting in an increased likelihood of engaging in behaviors drinkers would not have engaged in otherwise.

CAB consumption may be uniquely related to engaging in aggressive behavior even after considering one's typical alcohol use. That is, although drinking alcohol can decrease inhibitions and lead to physical aggression (Giancola, 2002; Giancola et al., 2009; Smucker Barnwell et al., 2006), the caffeine properties of CABs may make someone become even more aggressive as they feel less intoxicated and more energized. Thus, because individuals may not be experiencing a sedative effect from alcohol (Marczynski & Fillmore, 2006), yet are still under the influence, they may be more responsive and quick to react aggressively. Moreover, CABs are commonly consumed in social environments such as bars and clubs (Peacock, Bruno, & Martin, 2012) that can elicit aggression (Rossow, 1996; Single & Wortley, 1993). Thus, the properties of

CABs and the context in which CABs are frequently used may lower inhibitions, thereby increasing the likelihood of aggressive behavior. Indeed, limited extant research suggests that CAB use is associated with heightened levels of physical aggression. Woolsey et al. (2010) found that among young adults who typically drink CABs, individuals reported being more likely to act aggressively when drinking CABs as compared to occasions where they consumed only non-caffeinated alcohol. Similarly, a qualitative study found that CAB users reported aggressive behavior after drinking CABs (e.g., lashing out, becoming violent; Jones et al., 2012). Researchers also suggested that because some users may feel less inhibited when drinking CABs, they may attribute their aggressiveness to their CAB use, negating personal responsibility for uncharacteristically aggressive behavior (Jones et al., 2012).

In general, prior studies suggest CAB use may heighten one's risk of engaging in aggressive behaviors even more than consuming non-caffeinated alcohol. However, the extent to which CAB use may be related to indirectly aggressive behavior is unknown. Given the reported aggressive responses and reduced behavioral inhibitions associated with CAB use (Droste et al., 2014; Jones et al., 2012; Woolsey et al., 2010), heavier use may increase the likelihood of indirectly aggressive behavior. Further, examinations of individual-level characteristics that may mitigate indirectly aggressive responses are needed.

### 1.3. Self-regulation

Self-regulation is an individual-level variable that may impact the aggression-inducing effects of alcohol. Self-regulation refers to one's attempts to exert control over thoughts, feelings, impulses, and behaviors (Baumeister et al., 2006), and its breakdown is believed to lead to impulsive behaviors (DeWall et al., 2007; Giancola et al., 2012; Quinn & Fromme, 2010). Lower levels of self-regulation are associated with adverse consequences including problematic alcohol use (Patock-Peckham, Cheong, Balhorn, & Nagoshi, 2001; Quinn & Fromme, 2010) and criminal behavior (Gottfredson & Hirschi, 1990).

The ability to regulate one's behavior has been identified as an influential factor of the relationship between alcohol consumption and various types of aggression (Giancola, 2004; Giancola et al., 2012; Sheehan & Lau-Barraco, 2013). Specifically, the ability to regulate behavioral and emotional impulses was found to moderate the relationship between acute alcohol consumption and physically aggressive responses (Giancola et al., 2012); suggesting that individuals with lower regulation are more likely to become aggressive after consuming alcohol than those with greater regulation. Consistent with the self-regulation literature, individuals who report behaving impulsively (e.g., acting without forethought) also report greater levels of indirect aggression (Warren, South Richardson, & McQuillin, 2011). Further, one cross-sectional study identified self-regulation as a moderator of indirect aggression and an alcohol-related construct (i.e., alcohol aggression expectancies; Sheehan & Lau-Barraco, 2013). Specifically, stronger endorsement of the belief that alcohol causes aggression predicted more frequent engagement in indirectly aggressive behavior but only among those who also reported lower regulatory skills. These studies highlight that regulatory control over one's behavior may be an important variable to consider when assessing indirect aggression.

Overall, prior studies suggest that individuals who have lower levels of self-regulation, and thus lack the ability to control their impulses, exhibit more frequent direct (Giancola, 2004; Giancola et al., 2012) and indirect aggression (Sheehan & Lau-Barraco, 2013) related to drinking. Therefore, higher self-regulation may serve as a protective factor, with individuals higher in this trait being less likely to engage in impulsive behaviors, including aggression. This regulation also may contribute to the relationship between CAB consumption and aggression. As experimental findings suggest CAB consumption leads to reduced behavioral control (Marczynski, Fillmore, Bardgett, & Howard, 2011), drinking CABs may increase the likelihood of engaging in impulsive behaviors, even more so than drinking alcohol alone. Thus, it is possible that

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