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Psychopathy and the Prediction of Alcohol-Related Physical Aggression: The Roles of Impulsive Antisociality and Fearless Dominance

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Abstract

Background—It is well established that individual difference factors modulate aggression under the acute effects of alcohol. In this investigation, we tested the hypothesis that one core dimension of psychopathy, Impulsive Antisociality, would modulate intoxicated aggression, whereas another dimension, Fearless Dominance, would not.

Methods—Participants were 516 young social drinkers (253 men and 263 women). Psychopathy was measured using the Psychopathic Personality Inventory (PPI; Lilienfeld and Andrews, 1996). Following the consumption of either an alcohol or a placebo beverage, aggression was measured with a task in which participants administered and received electric shocks to/from a fictitious opponent under the guise of a competitive reaction-time task.

Results—Hierarchical regression analyses supported our hypothesis: Impulsive Antisociality predicted aggression under alcohol, whereas Fearless Dominance did not.

Conclusions—Persons who tend to endorse antisocial and impulsive externalizing behaviors appear to be at greater risk for aggression under the acute influence of alcohol.

Keywords

Alcohol; Fearless Dominance; Impulsive Antisociality; Physical Aggression

> Alcohol, as a sort of catalyst, sometimes contributes a good deal to the long and varied series of outlandish pranks and inanely coarse scenes with which nearly every drinking psychopath's story is starred. ~ Hervey Cleckley, 1982.

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1. Introduction

Alcohol has been shown to facilitate aggression in some, but not all persons. Several researchers have uncovered traits to help identify who is at greater risk for the perpetration of aggression when acutely intoxicated. Alcohol intoxication is more likely to facilitate aggression in persons with elevated levels of emotional detachment (Reardon et al., 2002), sensation seeking (Cheong and Nagoshi, 1999), trait anger (Giancola, 2002), dispositional aggressivity (Tremblay et al., 2008), and low levels of dispositional empathy (Giancola, 2003). Additionally, persons with a history of childhood aggression (Jaffe et al., 1988) a diagnosis of antisocial personality disorder (Moeller et al., 1998), and those with an aggressive personality (Giancola et al., 2012) are at greater risk for exhibiting aggressive behavior under the acute influence of alcohol. Giancola and colleagues (2012) examined a variety of traits thought to comprise aggressive personality including dispositional aggressivity and affective, behavioral, cognitive, and dispositional anger and found that these traits comprise a unitary variable. This aggressive personality variable moderated the alcohol-aggression relation such that alcohol was significantly more likely to increase aggression in persons with higher, compared with lower, aggressive personality scores (Giancola et al., 2012).

Related to several of the above risk factors, it is important to consider the role of psychopathy in alcohol-related aggression. The relation between psychopathy and violence is well established in the empirical literature (Edens and McDermott, 2010; Kennealy et al., 2010; Harpur and Hare, 1994; Patrick et al., 2009; Serin and Amos, 1995). Few would dispute that alcohol intoxication will facilitate aggression in psychopaths. However, psychopathy has been repeatedly shown to not be a unitary construct (Brinkley et al., 2004; Hare, 1991; Harpur et al., 1989), thus it is important to understand which dimensions of psychopathy predict aggression under the effects of alcohol.

1.1. Dimensions Underlying Psychopathy

One useful model for understanding the dimensions underlying psychopathy has been proposed by Patrick and colleagues (2009). They described a triarchic model of psychopathy that includes three facets: disinhibition, boldness and meanness. Disinhibition is characterized by impulse-control problems including externalizing psychopathology such as angry aggression and addictive behaviors and low inhibitory control. Boldness is described as a capacity to remain calm in dangerous situations, to recover quickly from, or react less severely to, exposure to stress, and to tolerate distress. Meanness includes a lack of empathy and affective attachment, tendency toward manipulation and deceitfulness, and “empowerment through cruelty” (p.927).

The Psychopathic Personality Inventory (PPI; Lilienfeld and Andrews, 1996) provides measures of at least two of these three dimensions. In a series of studies, Benning et al. (2003) found an orthogonal structure (labeled PPI-I and PPI-II) on the factor structure of the PPI in a large community sample of men. Consistent with the Patrick et al. (2003) model, PPI-I was labeled Fearless Dominance, and consisted of the PPI subscales of Social Potency, Fearlessness, and Stress Immunity. As Benning and colleagues (2005) noted, this factor is analogous to Boldness. PPI-II was labeled Impulsive Antisociality (referred to as Self-Centered Impulsivity on the revised PPI*),* and consisted of the PPI subscales of Carefree Nonplanfulness, Impulsive Nonconformity, Machiavellian Egocentricity, and Blame Externalization. This factor is analogous to the previously noted construct of Disinhibition (Benning et al., 2005). The Coldheartedness subscale did not load on either factor and has been suggested to possibly represent the Meanness dimension in the Patrick et al. (2003) conceptualization. The two core dimensions of Fearless Dominance and Impulsive Antisociality are now represented by scales in the revised version of the PPI, known as the

PPI-R (Lilienfeld and Widows, 2005). However, the PPI-R was not yet developed when this study was initially conducted.

1.2. The Different Dimensions of Psychopathy and Aggression

Consistent with the theoretical and empirical identification of the two broad factors of psychopathy just discussed, one related to disinhibition and risk for externalizing behavior and the other related to interpersonal dominance and the ability to stay calm and tolerate distress, research has shown that the former factor tends to be associated with aggression and violence risk (along with other externalizing behaviors) but the latter does not (Edens et al., 2008). For example, in a sample of prison inmates, Cima and Raine (2009) found that the disinhibition factor, measured by Impulsive Antisociality, had a correlation of r=.57 (p<.01) with reactive aggression and .60 (p<.01) with proactive aggression. The Boldness and Fearless Dominance factors did not correlate with reactive aggression yet correlated more modestly with proactive aggression (r=.26, p<.05).

Moreover, Edens et al. (2008) found that Impulsive Antisociality was related to several markers of misconduct, including aggressive misconduct, but not Fearless Dominance in prison inmates. Edens and McDermott (2010) then found that Self-Centered Impulsivity predicted hostility (r=.30 p<.001) and violence risk (r=.26 p<.01) in a sample of psychiatric inpatients using the PPI-R. Fearless Dominance was not significantly related to either of the two abovementioned relations (r's range from -.01 to -.09). The previous findings have been found to be consistent with those using a short form of the PPI.

Taken together, this body of findings support the conclusion that Impulsive Antisociality is associated with externalizing psychopathology, including tendencies toward impulsive and aggressive behavior and substance abuse, and that Fearless Dominance is associated with low levels of stress and interpersonal dominance (Blonigen et al., 2010; Edens and McDermott 2010, Smith, Edens, and Vaughn, 2011). These findings point to the prediction that individual differences in Impulsive Antisociality, but not in Fearless Dominance, are associated with aggressive behavior, particularly under alcohol. Indeed, there is evidence that antisocial and impulsive traits may moderate the relation between acute alcohol intoxication and aggression (Cheong and Nagoshi, 1999; Edens et al., 2008; Moeller et al., 1998; Smith et al., 2011; Tremblay et al., 2008).

1.3. Prior Investigation of Psychopathy as a Moderator on the Alcohol-Aggression Relation

Only one known laboratory study has assessed the moderating effects of psychopathy on the alcohol-aggression relation (Denson et al., 2009). Psychopathy was measured with a revised version of the PPI but it did not moderate the alcohol-aggression relation; in other words, psychopathy was not a risk factor for aggression under alcohol intoxication compared with placebo. However, there are three features regarding this study that indicate the need for further inquiry: first, the moderator (i.e., overall psychopathy scores on the PPI), may have diluted the more singular effect of Impulsive Antisociality, which may have been more strongly related to aggression, with the effect of Fearless Dominance, which has consistently been unrelated to aggression in previous studies (Cima and Raine, 2009; Edens et al., 2008; Edens and McDermott, 2010; Smith et al., 2011); second, the possibility that Impulsive Antisociality moderates the impact of alcohol on aggression was not tested by Denson and colleagues; finally, Denson and colleagues operationalized aggression as the administration of a noxious hot sauce to a fictitious participant who was relatively *unprovoked* (which is a necessary condition for an aggressive reaction) by the actual participant. The present investigation addresses each of these limitations.

1.4. Present Investigation

We used a laboratory paradigm to assess the hypothesis that a particular dimension of psychopathy, Impulsive Antisociality, will moderate the relation between alcohol consumption and aggressive behavior. In other words, when under the influence of alcohol, persons with higher scores of impulsive antisociality will be more likely to exhibit physical aggression compared with those persons with lower scores. Moreover, based on the above review, we did not expect to find any evidence that the other core dimension of psychopathy, Fearless Dominance, would moderate the alcohol-aggression relation. The present investigation is the first to test the differential roles of these two dimensions of psychopathy on the alcohol-aggression relation.

2. Methods

2.1. Participants

Participants were 516 healthy social drinkers (49% men) between 21 and 35 years of age (M=23.1; SD = 2.9), recruited from the Lexington, KY area through newspaper advertisements and fliers. Social drinking was defined as consuming at least 3-4 drinks per occasion at least twice per month. The ethnic composition of the sample was 87% Caucasian, 10% African-American, 1% Hispanic, and 2% Other. Most participants (92%) were never married, had an average of 16 years of education, and an average household income of $61,000. The study was approved by the University of Kentucky Institutional Review Board.

Respondents were initially screened by telephone. Individuals reporting any past or present drug- or alcohol-related problems, contraindications to alcohol consumption, serious head injuries, learning disabilities, or serious psychiatric symptoms were excluded from participation. Persons scoring an “8” or more on the Short Michigan Alcoholism Screening Test (Selzer et al., 1975), which may suggest drinking problems, were also excluded. Upon arrival at the laboratory, anyone with a positive breath alcohol concentration (BrAC) test or with a positive urine pregnancy/drug result (i.e., cocaine, marijuana, morphine, amphetamines, benzodiazepines, and barbiturates) were also not allowed to participate. Women were not tested between one week before menstruation and the beginning of menstruation because hormonal variations associated with menstruation can affect aggressive responding (Volavka, 1995).

2.2. Measures

2.2.1. Psychopathy—Participants were told that the researchers were studying the effects of alcohol and personality on reaction time in a competitive situation. First, participants completed the Psychopathic Personality Inventory (PPI; Lilienfeld and Andrews, 1996). The PPI is an 187 item measure scored on a 4-point Likert scale (1=false, 2=mostly false, 3=mostly true, and 4=true). The PPI produces a global index of psychopathy (total score) and scores on eight subscales that include: *Machiavellian Egocentricity* (self-centered and aggressive in interactions with other people), *Social Potency* (ability to manipulate and deceive others), *Fearlessness* (lacks concern for consequences, desire to take risks), *Coldheartedness* (lack of empathy towards others), *Impulsive Nonconformity* (rebellious, unconventional), *Blame Externalization* (blaming others for own actions), *Carefree Nonplanfulness* (lacks future planning and consideration of consequences), and *Stress Immunity* (experiences minimal distress and anxiety). Prior research has demonstrated high internal consistency with coefficients ranging from .89 to .93 for the total score and and subscale coefficients ranging from .70 to .91 (Lilienfeld and Andrews, 1996). High test-retest reliability was observed over a period of 26 days with a reliability index of .95 for the total PPI score and a range of indexes on the PPI subscales from .82 to .94. As noted above,

Social Potency, Fearlessness, and Stress Immunity load on a common dimension, termed Fearless Dominance; and *Machiavellian Egocentricity, Blame Externalization, Carefree Nonplanfulness,* and *Impulsive Nonconformity* load on another common dimension, termed Impulsive Antisociality (Benning et al, 2005).

2.2.2. Aggression—A modified version of the Taylor Aggression Paradigm (TAP; Taylor, 1967) was used to measure aggression. Participants both administered and received electric shocks from a fictitious opponent under the guise of a competitive reaction-time task. Participants sat in front of a computer screen that instructed them to press, hold, and release the spacebar on their keyboard. They supposedly competed against their opponent on this task to determine who could respond more quickly, with the winner delivering an electric shock to the loser. Winners supposedly controlled the intensity (from the lowest at "Level 1" to the highest at "Level 10") and duration of the losers' shocks. After each trial, shock intensities set by the participant and the "opponent" were displayed on the computer screen. The task consisted of 34 trials, and participants won half of the trials in a fixed, random pattern. Following a losing trial, participants received one of 10 possible shock intensities that each lasted one second. All shocks were administered through two finger electrodes. The initiation of trials, administration of shocks, and recording of responses were controlled by a computer. We operationalized physical aggression as a combination of the shock intensities (1 through 10) and durations (in milliseconds) that participants administered to their opponent. To calculate this score, we transformed the shock intensity and duration variables into *z*-scores, summed each set of scores, and then summed across all 34 trials. This task has excellent construct validity and has been used for decades as a laboratory measure of aggression for men and women (reviewed in Giancola and Chermack, 1998).

2.3. Procedure

Participants were instructed to refrain from drinking alcohol 24 hours prior to testing, to avoid caffeinated beverages the day of the study, to not use recreational drugs from the time of the telephone interview, and to refrain from eating four hours prior to testing. They were told that the investigation concerned the effects of alcohol and personality on reaction-time in a competitive situation. After demographic data was obtained, participants completed the PPI.

Men and women were divided evenly into alcohol and placebo beverage groups. Due to gender differences in body fat composition and alcohol metabolism (Watson et al., 1981), men and women received different alcohol doses. Men received 1g/kg of 95% alcohol USP mixed at a 1:5 ratio with a national brand of orange juice, whereas women received 0.90g/kg of alcohol. The placebo beverages contained 4 mls of alcohol in the juice and 4 mls layered on top of the juice. In addition, the rims of the glasses were sprayed with alcohol just prior to being served. All participants were told that they would consume the equivalent of 3-4 mixed drinks. Participants were given 20 minutes to consume their beverages. Breath alcohol concentration (BrAC) levels were measured using the Alco-Sensor IV breath analyzer (Intoximeters Inc., St. Louis, MO) upon entry at the laboratory, before, and after the TAP.

Instructions for the TAP were given as participants began drinking their beverages. Everyone was told that their opponent was of the same gender and was intoxicated. Pain thresholds and tolerances to the electric shocks were assessed just prior to beginning the TAP to determine the intensity parameters of the shocks participants would receive. The experimenter gradually increased the level of shock until it became "painful" to the participant. Level 10 was the shock intensity described by each participant as "painful,"

Level 9 was 95% of the "painful" level, Level 8 was 90% of the "painful" level, and so on. Levels 1, 5, and 10 were described as "Low," "Medium," and "High," respectively.

Just before the TAP, participants rated how drunk they felt (0=*not drunk at all* to 11=*more drunk than I have ever been*), how impaired they were (0=no impairment to 10=strong impairment), and whether they believed they had consumed alcohol (*No* or *Yes*). Immediately following the TAP, they completed the PPI. Right after the psychopathy inventory, participants again answered the same questions about their alcohol consumption. Finally, they were debriefed, and those who received alcohol remained in the laboratory until their BrAC dropped to 0.04%.

3. Results

3.1. Manipulation Checks

BrAC Levels—All participants tested in this study had BrACs of 0% upon entering the laboratory. Individuals in the alcohol group had a mean BrAC of 0.095% (*SD*=0.011) just before beginning the TAP and a mean BrAC of 0.105% (*SD*=0.016) immediately after the task. Persons given the placebo had a mean BrAC of 0.015% (*SD*=0.011) just before the TAP and a mean BrAC of 0.007% (*SD*=0.007) immediately after the task. There were no gender differences in mean BrACs either before (men=.094%; women=.096%) or after (men=.103%; women=.106%) the TAP.

3.1.1. Aggression Task Checks—To verify the success of the TAP deception, participants were asked about their subjective perceptions of their opponent. The deception manipulation appeared successful. Anecdotal reports suggest that the majority of participants felt they did equally well on the task as their opponent and thought that their opponent tried hard to win. Previous research has shown that the TAP provides a valid and reliable laboratory measure of aggression (e.g., Giancola and Parrott, 2008) and that, within the ethical limits of the laboratory, participants believe that they control an actual weapon that can inflict temporary painful physical harm (i.e., electric shocks) onto their opponent.

3.1.2 Placebo Checks—All participants in the placebo group indicated that they believed that they drank alcohol. With regard to the question regarding how drunk they felt, persons in the alcohol group reported mean pre- and post-TAP ratings of 4.6 and 5.0 (scale range: 0-11) and those in the placebo group reported mean pre- and post-TAP ratings of 1.8 and 1.9, respectively, [pre-TAP ratings: $t(514)=-20.08$, $p<.05$; post-TAP ratings: $t(516)=-19.73$, $p<.05$]. With regard to the question about whether the alcohol they drank caused any impairment, persons in the alcohol group reported an average rating of 5.53 and those in the placebo group reported an average rating of 2.1, $t(516)=-19.31$, $p<.05$, (scale range: 0-10). Given the alcohol dose used in this investigation, it is impossible to expect that subjective feelings of intoxication can be equated between the alcohol and placebo groups, especially when dealing with experienced drinkers. As such, it has been pointed out by Martin and Sayette (1993), in an authoritative review on the topic of placebo manipulations, that the success of a placebo manipulation is reflected by the fact that persons believed that they consumed alcohol which is considered, in and of itself, to be enough to activate any behavioral effects that alcohol has been consumed (Vogel-Sprott, and Fillmore, 1999). Thus according to this well accepted guideline in the alcohol administration research literature, our placebo manipulation is considered to be valid and effective.

3.2. Gender Differences

Results indicated no significant gender differences on the demographic variables of age, years of education and yearly salary. However, consistent with previous findings of

significant gender differences related to psychopathic traits (Kruger et al., 2002), men (M=.19, SD=1.0) had significantly higher z-scores on Fearless Dominance as compared with women (M=-.16, SD=.95), $t(513)=4.08$, $p<.001$. Additionally, men had higher z-scores (M=.26, SD=.87) on Impulsive Antisociality compared with women (M=-.28, SD=.97), $t(513)=6.70$, $p<.001$).

3.3. Regression Analyses

The primary aim of this investigation was to examine main effects of beverage and PPI factor elevations on aggression, and most important, whether the Impulsive Antisociality factor of the PPI would moderate the relation between acute alcohol intoxication and aggression. Demographic variables were not significantly correlated with TAP aggression scores and, as such, were not included in the regression equations.

3.3.1. Fearless Dominance—The first step of the model containing only the main effects of beverage, gender, and Fearless Dominace was significant, $F(3,513)=32.4$, $p<.001$; $R^2=.16$ (see Table 1). Alcohol increased aggression compared with placebo (b=-.51,$p<.001$), men were more aggressive than women (b=-.67, $p<.001$), and higher Fearless Dominance scores were associated with increased aggression (b=.25, $p<.001$). The second model was also significant, $F(6,513)=18.1$, $p<.05$; $R^2=.18$. Beverage × Gender (b=.45, $p<.05$) was the only significant 2-way effect. This interaction indicated that alcohol facilitated aggression more for men than for women. Finally, the full model was significant $F(1,513)=.527$, $p<.001$; $R^2=.18$), however, the 3-way effect was not significant.

3.3.2. Impulsive Antisociality—The model containing only the main effects of beverage, gender, and Impulsive Antisociality was significant, $F(3,513)=28.53$, $p<.001$; $R^2=.14$ (see Table 2). Alcohol increased aggression compared with placebo (b=-.54, $p<.001$), men were more aggressive than women (b=-.65, $p<.001$), and higher Impulsive Antisociality scores were associated with increased aggression (b=.20,$p<.01$). The second model was also significant, $F(6,513)=17.1$, $p<.001$; $R^2=.17$. Within this model, significant 2-way effects were observed for Impulsive Antisociality × Beverage (b=-.28, $p<.05$; see Figure 1), and Impulsive Antisociality × Gender (b=-.25, $p<.05$). In exploring the 2-way interaction of Impulsive Antisociality × Beverage, the relation between Impulsive Antisociality and aggression in the alcohol group, (b=.48, t=4.40, $p<.001$), was significantly stronger than the same relation in the placebo group, (b=.21, t=2.10, $p<.05$). In other words, compared with placebo, alcohol was significantly more likely to increase aggression for persons with higher Impulsive Antisociality scores than for persons with lower scores. Decomposition of the Impulsive Antisociality × Gender interaction indicated that the relation between Impulsive Antisociality and aggression was significantly stronger for men (b=.48, t=.40, $p<.001$), than it was for women (b=.23, t=2.48, $p<.05$). Finally, the full model was significant $F(1,513)=.17$, $p<.001$; $R^2=.04$); however, the 3-way effect was not significant.

We also tested whether there was an interaction between Fearless Dominance and Impulsive Antisociality in predicting alcohol-related aggression by including them in the same hierarchical regression model. There was no such effect.

4. Discussion

Results demonstrated the importance of assessing the dimensions of psychopathy as differential risk factors for alcohol-related aggression. Fearless Dominance reflects the core features of psychopathy including callousness, immunity to stress, and the interpersonal skills to manipulate and deceive others; Impulsive Antisociality encompasses the psychopathic features of a lack of regard for the rights of others, impulsivity, no concern for

the consequences of one's actions, and a tendency for antisocial behavior. Although both dimensions predicted physical aggression, only Impulsive Antisociality potentiated the impact of alcohol on subsequent aggressive behavior. That is, persons with higher Impulsive Antisociality scores who received alcohol were significantly more aggressive than their counterparts who received the placebo. In contrast, high and low-scorers on Fearless Dominance did not differ in aggression across beverage conditions.

This is only the second laboratory investigation to evaluate the impact of psychopathy on the relation between acute alcohol intoxication and aggression. In the first study, the investigators used the total PPI score and found no moderating effect of psychopathy (Denson et al., 2009). The use of the total PPI score involved combining the effects of Fearless Dominance and Impulsive Antisociality. The findings of the current investigation suggest that the result of doing so may have obscured the potentiating effect of Impulsive Antisociality on alcohol-related aggression. It thus seems important to consider each dimension of psychopathy separately.

The current investigation contributes to a converging literature on the different roles of Fearless Dominance and Impulsive Antisociality in the prediction of behavior. Past research has consistently identified Impulsive Antisociality as related to aggression and violence risk (cf. Edens et al., 2008); the current study showed that Impulsive Antisociality increases the likelihood of aggression when drinking. In contrast, the interpersonal and affective features of psychopathy, reflected in Fearless Dominance, are not generally associated with aggression and did not potentiate aggressive responding following alcohol consumption in this study. In related bodies of research, both antisocial behavior and impulsivity have been shown to correlate with intoxicated aggression (Cheong and Nagoshi, 1999; Tremblay et al., 2008; Moeller et al., 1998); the current findings are consistent with those results as well.

These converging findings provide support for Patrick et al.'s (2009) triarchic conceptualization of psychopathy. Their distinction between a disinhibition dimension, represented by the Impulsive Antisociality factor, and the boldness dimension characterized by interpersonal dominance, the ability to stay calm, and the ability to tolerate stress, and represented by the Fearless Dominance factor, has proven important for understanding alcohol-related aggression.

Some authors have questioned the external validity of the Taylor Aggression Paradigm (TAP), specifically whether the TAP generalizes to “real world” violence. The TAP and its modified versions have successfully differentiated violent from non-violent prison inmates (reviewed in Giancola and Chermack, 1998). Additionally, studies show positive relations between shock selections and self-report measures of physical assault, behavioral hostility, and outwardly directed anger (Giancola and Parrott, 2008; Hammock and Richardson, 1992). Finally, it is difficult to dispute that within the ethical limits of the laboratory, subjects control an actual weapon (i.e., the TAP) that can be used to inflict violence (i.e., painful electric shocks) upon another person.

Of course, the current findings should be replicated on an independent sample. In addition, future research can examine the degree to which the current results generalize to other populations, such as men and women who are incarcerated. If our results are confirmed, they can provide guidance for interventionists concerned with violence and harm reduction. Future studies might also investigate, in addition to physical aggression, whether individual differences in Impulsive Antisociality moderate the effects of alcohol on other maladaptive or harmful externalizing behaviors. In addition, it is likely that our results would be more robust if we used a sample who endorsed frequent binge episodes of alcohol consumption; therefore it would be important to evaluate whether Impulsive Antisociality continues to

moderate the alcohol-aggression relation among those identified as problem, versus social, drinkers. Ultimately, it may be that treatments focused on Impulsive Antisociality could prove useful for reducing alcohol-related aggression.

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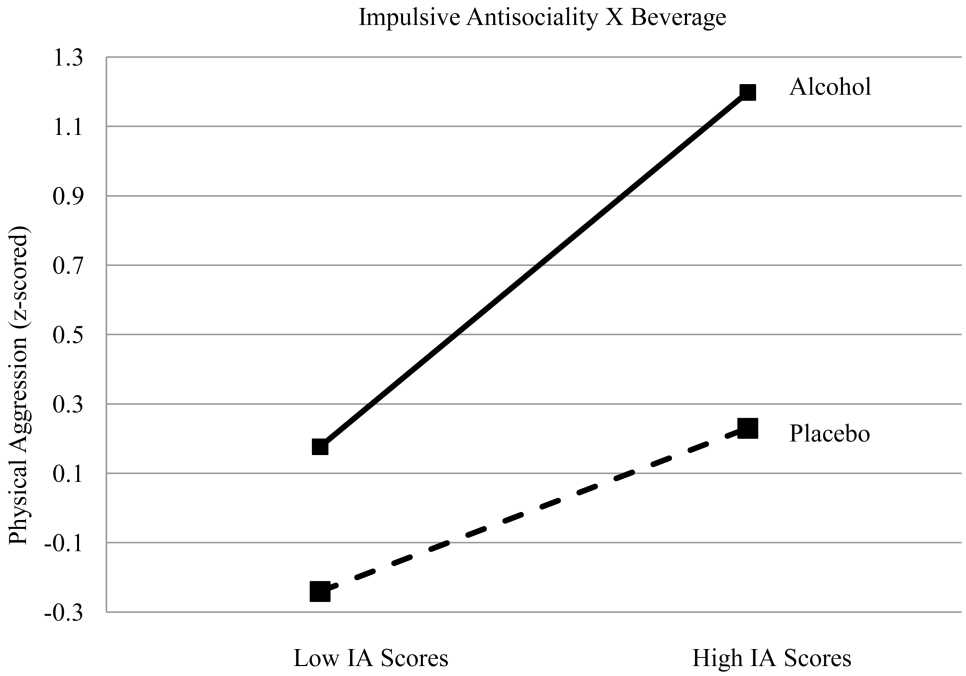

Figure 1.
Impulsive Antisociality as a moderator of the alcohol-aggression relation. Impulsive Antisociality=IA. Regression lines are anchored at -1 SD and +1 SD below and above the z-scored mean of zero.

Table 1

Logistic Stepwise Regression Analyses for Fearless Dominace.

Step	R^2	F	df 1	df 2	*b*
1: Main Effects	.16	32.40***	3	513	
BEV					-.51***
GEN					-.67***
FD					.25***
2: 2-Way Interactions	.18	18.10*	6	513	
BEV × GEN					.45*
BEV × FD					NS
GEN × FD					NS
3: 3-Way Interaction	.18	.53***	1	513	
BEV × GEN × FD					NS

BEV=beverage, GEN=gender, FD=Fearless Dominance,

*=p<.05,

**=p<.01,

***=p<.001,

NS=non-significant.

Table 2

Logistic stepwise regression analyses for Impulsive Antisociality.

Step	R^2	*F*	df 1	df 2	*b*
1: Main Effects	.14	28.53***	3	513	
BEV					-.54***
GEN					-.65***
IA					.20**
2: 2-Way	.17	17.10***	6	513	
Interactions					NS
BEV × GEN					-.28*
BEV × IA					-.25*
GEN × IA					
3: 3-Way	.04	.17***	1	513	
Interaction					NS
BEV × GEN × IA					

BEV=beverage, GEN=gender, IA=Impulsive Antisociality,

*=p<.05,

**=p<.01,

***=p<.001,

NS=non-significant.