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A Self-Awareness Intervention Manipulation for Heavy Drinking Men's Alcohol-Related Aggression Toward Women

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Abstract

Objective—The primary aim of the present investigation was to directly examine a theoretically-based, self-awareness intervention manipulation for at-risk men's alcohol-related aggression toward women. This study was developed in response to a call in the literature for research to (1) empirically investigate specific intervention techniques that reduce aggression, and (2) identify in whom such interventions will have the greatest impact.

Method—A community sample (77% African-American) of 94 heavy drinking males age 21 years and older (M = 35.61) completed a battery of questionnaires that assessed alcohol consumption and perpetration of aggression toward women during the past year as well as dispositional masculine gender role stress. Participants were randomly assigned to an intervention manipulation designed to focus attention onto inhibitory, self-awareness cues or a control group. Following beverage consumption, participants were provoked with a gender-relevant provocation from a female confederate and participants' physical aggression was measured using a shock-based aggression task.

Results—Men who received the intervention manipulation, relative to control, enacted significantly less alcohol-related physical aggression toward the female confederate. This finding held for men who reported lower, but not higher, levels of masculine gender role stress.

Conclusions—Findings support the development of interventions that aim to redirect intoxicated men's attention toward stimuli that is non-aggressive, non-provocative, and/or prohibitive of aggressive behavior. However, caution is warranted that *en masse* dissemination of such interventions may not impact the most at-risk men for alcohol-related violence toward women.

Keywords

Alcohol consumption; Alcohol myopia theory; Attention-allocation model; Physical aggression; Intervention

It is well established that alcohol is a contributing cause of men's aggression toward women (Abbey, Zawacki, & Buck, 2005; Leonard & Quigley, 1999). Data indicate that men perpetrate more severe acts of violence, and women report more severe effects of injury, if

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the male perpetrator consumed alcohol at the time of the assault (Tjaden & Thoennes, 2000). The literature also indicates that alcohol-related aggression is robust across context and victim-perpetrator relationship. Indeed, men's acute alcohol consumption has been linked to women's victimization across contexts, with acquaintance sexual aggression and intimate partner violence being the most prevalent (Testa & Parks, 1996). However, event-based research in bar settings has suggested that women experience more aggression when they interact with men who they do not know then when they interact with an acquaintance (Parks, 2000). As such, there is consistent evidence that acute alcohol intoxication engenders men's aggression toward women under numerous circumstances and independent of men's relationship with the victim.

Existing interventions, primarily for intimate partner violence, seek to decrease aggression by reducing or eliminating the perpetrator's alcohol use. While this approach has demonstrated promise and small-to-moderate effect sizes (Murphy & Ting, 2010), it is not without limitations. Most notably, even if treatment for an alcohol use disorder was deemed a first-line intervention for intoxicated aggression, the reality is that many patients do not achieve sustained abstinence and the long-term effects of these interventions are unknown. Thus, it is critical that interventions also target aggression within the context of acute alcohol consumption. However, only recently has research begun to explore individual and public-health interventions for persons who have *already* consumed alcohol (e.g., Gallagher & Parrott, 2011; Giancola & Corman, 2007; Graham & Homel, 2008), and no study to date has investigated the impact that individual differences may have on intoxicated men's response to intervention.

To this end, it has been emphasized that theoretical approaches to the study of alcohol-related aggression must examine the confluent impacts of alcohol consumption, aggression-facilitating characteristics of individuals, and situational contexts (Lang, 1993; Leonard, Quigley, & Collins, 2003). Lang (1993) conceptualized this as an interaction of Agent (alcohol) × Host (person) × Environment (situation). The present study addressed how each area purportedly contributes to a potential intervention for alcohol-related aggression toward women. Pertinent theory and empirical evidence to this end are reviewed herein.

Attention-Allocation Model: Alcohol as the Agent

The attention-allocation model of alcohol myopia theory (Steele & Josephs, 1990) posits that alcohol intoxication impairs attentional capacity, which then restricts the inebriate's attentional focus to the most salient cues in the environment. This model has largely been used to explain why alcohol increases aggressive behavior, because in most real world situations provocative cues are also the most salient. However, it also makes the counterintuitive prediction that alcohol may *decrease* aggressive behavior, even below that of sober individuals. In a situation where non-provocative or inhibitory 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 individuals faced with the same situation will still possess sufficient working memory to allocate attention to both sets of cues, thus resulting in a higher likelihood of aggressive action relative to intoxicated individuals.

Laboratory based-research supports this hypothesis. To date, studies have shown that cognitive distraction facilitates attention allocation toward inhibitory mechanisms and away from instigatory mechanisms (Gallagher & Parrott, 2011); likewise, distraction from provocative cues or loading attentional capacity with inhibitory cues is associated with less intoxicated aggression (Gallagher & Parrott, 2011; Giancola & Corman, 2007; Giancola, Duke, & Ritz, 2011). However, alcohol does not take us on a roller coaster ride of "immediate impulses arising from whatever cues are salient" on every drunken occasion (Steele & Josephs, 1990; p. 354). In other words, intoxicated individuals likely differ in the extent to which they display aggression in response to a given salient cue. Thus, it is imperative that research investigate which individuals will be most receptive to cues that inhibit aggression and under what environmental conditions the inhibition is most likely to occur. Only then can the theoretical predictions of the attention-allocation model be used to develop effective interventions for alcohol-related aggression.

Individual Risk Factors: Masculine Gender Role Stress as the Host

A significant number of studies indicate that alcohol only facilitates aggression for those who possess risk factors for aggressive behavior (Chermack & Giancola, 1997). However, more absent in the literature are constructs common to interactions in which male-to-female alcohol-related aggression is likely to occur (e.g., a gender-relevant provocative scenario). In particular, one understudied construct pertinent to men's intoxicated aggression toward women is masculine gender role stress. Masculine gender role stress refers to men's tendency to cognitively appraise gender-relevant situations as threatening or stressful. These situations include gender-relevant conflict or situations that require defense of the traditional male gender role (Copenhaver, Lash, & Eisler, 2000; Eisler, Franchina, Moore, Honeycutt, & Rhatigan, 2000). Not surprisingly, masculine gender role stress has been directly associated with men's aggression toward women (Copenhaver et al., 2000; Eisler et al., 2000; Moore et al., 2008).

Intervention: The Bar Setting as the Environment

Theoretical and empirical work has begun to establish a foundation for intervention research in the field of alcohol-related aggression (for a review, see McMurran, 2013). One line of research calls for the environmental use of "highly salient, frequent, and easy-to-process anti-violence cues that will re-direct the inebriate's attention away from hostile provocative cues onto more salient non-provocative, or even inhibitory, cues in situations in which violence often accompanies alcohol intoxication (e.g., bars, sports venues, college campus parties, etc.)" (Giancola, Josephs, Parrott, & Duke, 2010, p. 272). In particular, Giancola and colleagues (2009, 2010) aggregated a wealth of evidence to support the mechanism of *self-awareness* as a key component in this effort. This mechanism is grounded in objective self-awareness theory (Duval & Wicklund, 1972), which posits that self-focused attention will facilitate behavior(s) which conform to salient situational norms. Consistent with this view, experimental manipulations of self-awareness (e.g., mirrors, audiences, cameras) are associated with behavioral conformity to salient situational norms (e.g., Carver, 1974, 1975; Scheier & Carver, 1983).

Within an aggression-promoting context, researchers have long assumed that self-focused attention should reduce aggressive behavior because social norms generally discourage aggression. To this end, past research demonstrates that alcohol impairs self-awareness processing (Hull, 1981; Hull, Levenson, Young, & Sher, 1983), which may impede a person's capacity to process self-relevant cues that discourage aggressive behavior. Laboratory research suggests that intervention manipulations designed to increase self-awareness, such as the addition of mirrors (Carver & Scheier, 1978), reduces alcohol-related aggressive behavior toward oneself (Berman, Bradley, Fanning, & McCloskey, 2009) and others (Bailey, Leonard, Cranston, & Taylor, 1983). This research suggests that, by increasing self-awareness, the inebriate is distracted from provocation and able to process cues of inhibition.

Despite these data, no study to date has translated these findings into an intervention for alcohol-related aggression. To this end, the bar setting has been identified as an understudied but highly feasible point of intervention for alcohol-related aggression (Leonard et al., 2003). To move the field in this direction, researchers have proposed that "small-scale but rigorous studies could be undertaken to address more systematically the potential for reducing the contribution of specific environmental risk factors to bar violence and to assess the effects of specific regulatory techniques" (Graham & Homel, 2008, p. 256). For example, research has implicated several environmental characteristics common to bars that increase the risk of alcohol-related aggression (Graham, 2009; Leonard et al., 2003); these include crowding, poor traffic flow, dancing, pool playing, and excessive noise. Even so, limiting noise or redesigning the layout of bars may not be feasible options for existing establishments (Graham & Homel, 2008). Thus, instead of *taking away* characteristics from bars, it may be more reasonable to *add* characteristics to bars. For instance, research has found that the addition of video cameras outside entertainment areas reduced the number of assault-related emergency department attendances (Sivarajasingam, Shepherd, & Matthews, 2003). However, no study has tested whether salient self-awareness cues in the physical environment of a public setting reduce alcohol-related aggression.

The Present Study

In accordance with Lang's (1993) Agent × Host × Environment conceptualization, the present study investigated the interactive effect of a theoretically-based self-awareness intervention manipulation and masculine gender role stress on intoxicated men's physical aggression toward women in a sample of men who drink alcohol heavily. As reviewed, men who endorse higher levels of masculine gender role stress should perpetrate higher levels of physical aggression toward women because they appraise gender-relevant conflict as threatening to their rigid masculine identity. In accordance with Alcohol Myopia Theory, this effect will be especially pronounced among intoxicated men because they allocate their attention to salient instigatory cues in the environment (e.g., provocation, appraisal of gender relevant threat). However, when self-awareness cues are made highly salient in the physical environment, intoxicated men's attention should be redirected such that they perceive and process only these inhibitory cues (e.g., comparison of self and social standards of appropriate behavior) to the exclusion of less salient instigatory cues. Importantly, heavy drinking patterns, which can take different forms (e.g., high level of drinking each day,

repeated episodes of drinking to intoxication), place the drinker at greater risk for myriad alcohol-related problems (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001). Those problems include an increased risk of perpetrating violence (Leonard, 2005), which is in part due to their increased susceptibility toward aggression during periods of acute intoxication (Parrott & Giancola, 2006).

As such, the intent of this study was to advance past findings that inhibitory cues reduce alcohol-related aggressive behavior by utilizing (1) a theoretically-based self-awareness intervention manipulation, (2) a high risk sample of heavy drinking males, and (3) a gender-relevant masculinity threat from the female confederate. The ultimate goal was to exploit the alcohol myopia of inebriated persons and focus attention onto cues that inhibit aggressive behavior. This goal was accomplished by testing whether an intervention manipulation designed to focus attention onto inhibitory, self-awareness cues was associated with lower levels of alcohol-related aggression toward women. It was hypothesized that intoxicated men who received the intervention manipulation, relative to control, would enact significantly less aggression toward a female confederate following a gender-relevant provocation from that female. Further, it was hypothesized that masculine gender role stress would moderate this effect. Specifically, intoxicated men who reported higher levels of masculine gender role stress were expected to display significantly less aggression following the intervention manipulation relative to control. No such differences were expected for intoxicated men who reported lower levels of masculine gender role stress.

Method

Participants and Recruitment

Male drinkers were recruited from the local metro-Atlanta community via newspaper and online advertisements for a study on “alcohol’s effect on behavior.” Upon contacting the laboratory, respondents were provided with a brief description of the study and informed that they would be required to complete a questionnaire battery (Session 1) and participate in an experimental session on a separate day (Session 2). Respondents were initially screened over the telephone to confirm a pattern of heavy drinking during the past year. Heavy drinking was defined as the consumption of at least five drinks per occasion a minimum of two times per month. Respondents who self-reported that they weighed more than 160 lbs. were additionally required to have consumed on at least three occasions during the past year a quantity of alcohol that was equal to or greater than the standard dose administered for their weight in the laboratory. Those who reported past or present attempts to seek treatment for an alcohol or substance use disorder, a psychiatric disorder, a serious head injury, or a condition in which alcohol is medically contraindicated were also excluded.

Within one week of completing the telephone screening interview, ineligible participants were contacted by phone and informed that they would not be eligible to participate. Eligible participants were contacted by phone and scheduled for a Session 1 appointment. Participants were told to refrain from drinking alcohol or using recreational drugs 24 hours prior to testing and to refrain from eating four hours prior to testing. Eligibility criteria were reassessed by self-report upon participants’ presentation to Session 1. Further, as assessed by a modified version of the Conflict Tactics Scale (Straus, Hamby, Bony-McCoy, &

Sugarman, 1996; see below), 21 men who reported perpetration of severe physical aggression (e.g., beat up) toward any woman in the last year were excluded (see Figure 1).

The final sample of 94 men (Age: $M = 35.61$, $SD = 11.44$) included 72 African-Americans, 14 Caucasians, and 8 men who identified with another racial background. Seventy-three percent of participants had never been married, the mean education level was 14 years, and the mean income level was $19,760 yearly. In addition, 61% of men reported to have engaged in at least one episode of minor physical assault against any woman within the past year ($M = 3.31$, $SD = 5.54$). This study was approved by the university's Institutional Review Board.

Experimental Design

Participants were randomly assigned to an intervention or control group using Urn randomization (Stout, Wirtz, Carbonari, & Del Boca, 1994). The following variables were included in the Urn: age, years of education, marital status, race, average yearly income, average frequency and quantity of alcohol consumption, and dispositional physical aggression. The urn procedure was selected because it is less vulnerable to selection bias relative to other procedures of randomization (e.g., biased-coin design, permuted-block design) and was designed to ensure that both the intervention and control groups would be balanced on the aforementioned variables.

Every participant received alcohol. Placebo (i.e., told alcohol, receive no alcohol) and no-alcohol control (i.e., told no alcohol, receive no alcohol) groups were not utilized for two primary reasons. Foremost, two recent studies found that a cognitive distraction intervention manipulation failed to reduce aggression in men who received placebo control beverages (Giancola & Corman, 2007) or highly provoked men who received no-alcohol control beverages (Gallagher & Parrott, 2010). However, the cognitive distraction intervention manipulation significantly reduced aggression among intoxicated men. In addition, an abundance of research has evidenced longstanding negligible effects of (1) placebo control beverages and (2) no-alcohol control beverages on aggression (e.g., Bushman & Cooper, 1990; Hull & Bond, 1986).

Materials

Demographics form—This form assessed age, highest level of education, marital status, ethnic background, race, and income level.

Drinking patterns questionnaire—The National Institute on Alcohol Abuse and Alcoholism's (2003) recommended set of six alcohol consumption questions were administered to measure participants' past year alcohol use. Heavy drinking was assessed with the question, "During the last 12 months, how many alcoholic drinks did you have on a typical day when you drank alcohol?" A standard drink was defined as one 12-ounce beer, one 5-ounce glass of wine, one mixed drink with 1.5-ounces of 80-proof hard liquor, or a "shot" of hard liquor. Average frequency of consumption during the past year was assessed with the question "During the last 12 months, how often did you usually have any kind of drink containing alcohol?"

Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 2001)—This 10-item diagnostic scale was developed by the World Health Organization to screen for heavy drinking. This measure was used to provide personalized alcohol use psychoeducation and treatment referrals prior to discharge. Per AUDIT recommendations and the ethical guidelines of alcohol administration research, all men received literature focused on the reduction of problems or harms associated with heavy drinking. Further, men who scored 16–19 also received referrals for brief counseling and continued monitoring; men who scored 20 or above also received referrals for further diagnostic evaluation for alcohol dependence.

Aggression Questionnaire (AQ; Buss & Perry, 1992)—This 29-item, Likert-type scale measures participants' disposition toward physical aggression, verbal aggression, anger, and hostility. For the purpose of the present study, only the nine-item physical aggression subscale was analyzed (e.g., "If somebody hits me, I hit back") in order to identify group differences that could potentially confound laboratory-based physical aggression. Participants rated how each item describes them on a scale of 1 (*extremely uncharacteristic of me*) to 5 (*extremely characteristic of me*). This subscale has been shown to have high validity and reliability (α = .85). Adequate internal consistency was observed in the present study (α = .70).

Conflict Tactics Scale – Revised (CTS-2; Straus et al., 1996)—The Physical Assault subscale of a modified version of the CTS-2 was used to assess perpetration of physical aggression toward women during the past year. The CTS-2 is a widely used and well-validated self-report instrument that measures the frequency of aggression within intimate relationships. For the present study, this measure was modified to assess the frequency of aggression toward all women (not just intimate partners) by changing the phrase "your partner" to "a woman." Responses may range from 0 (never) to 6 (more than 20 times), and the frequency of physical assault is calculated by adding the midpoints of the score range for each item to form a total score. For example, if a participant indicates a response of "3–5" times in the past year, his score would be a "4." This method of scoring the CTS-2 permits examination of the frequency of different physically aggressive acts within the past year. Sample items include "Have you twisted a woman's arm or hair?" (*minor physical aggression*) and "Have you burned or scalded a woman on purpose?" (*severe physical aggression*).

Masculine Gender Role Stress Scale (Eisler & Skidmore, 1987)—This widely used and well-validated self-report measure assesses the extent to which gender relevant situations (e.g., "Being outperformed at work by a woman") are cognitively appraised as stressful or threatening. This scale consists of 40 items and responses may range from 0 (*not at all stressful*) to 5 (*extremely stressful*). Higher scores reflect more dispositional gender role stress. Research indicates it exhibits good psychometric properties (Eisler, Skidmore, & Ward, 1988). High internal reliability was obtained in the present sample (α = .94).

Taylor Aggression Paradigm (TAP)

A modified version (Giancola & Zeichner, 1995) of the TAP (Taylor, 1967) was used to measure direct physical aggression. The hardware was developed by Coulbourn Instruments (Allentown, PA), and the software was developed by Vibranz Creative Group (Lexington, KY). The TAP is presented as a reaction time competition in which electrical shocks are administered to and received from a fictitious opponent who is ostensibly "seated in an adjacent room." Participants are seated at a table with a computer screen and keyboard in a small room. The numbers "1" through "10" on the computer keyboard are labeled from "low" to "high" to allow participants to determine varying levels of shock to administer. Participants receive visual feedback on the computer monitor indicating whether they "won" or "lost" the trial as well as the shock level selected and received. Physical aggression is defined as the summation of standardized scores for the average intensity and duration of shocks selected. The TAP and other similar shock-based laboratory paradigms have been shown to be a safe and valid measure of aggressive behavior (e.g., Giancola & Parrott, 2008; Parrott, Miller, & Hudepohl, 2015).

Gender-Relevant Provocation

An established procedure was used to deliver a gender-relevant masculinity threat (e.g., Cohn, Seibert, & Zeichner, 2009). Participants were told ahead of time that they would be able to view both their own "personality profile" and view and comment on their opponent's profile. They were told that their personality profile reflected their answers to the self-report questionnaire measures completed during Session 1. Upon reaching a BrAC of .08%, a fictitious, pre-constructed paper graph of the female confederate's personality profile was provided to participants that placed her in the "neutral range" of personality. Participants were instructed to review the graph and provide their opinion of their opponent's personality profile by writing a brief comment on the sheet. Following this, a fictitious, pre-constructed paper graph of the participants' personality profile was provided to participants that placed them in the "female range" of personality. A fictitious, pre-constructed comment from the female confederate was written on the profile that stated "LoL! That test put you more in the 'Girl' range than me! OMG, most guys I hang out with are better at these physical type games than me. But I guess you aren't like 'most' guys. IMHO I'm definitely going to beat you!!" Past research indicates that men experience increased feelings of threat when they receive feedback inconsistent with their gender role (Vandello, Bosson, Cohen, Burnaford, & Weaver, 2008).

Attention-Allocation Model Intervention Manipulation

The intervention manipulation was informed by a range of theory and technique (Berman et al., 2009; Carver & Scheier, 1978, 1981; Duval & Wicklund, 1972; Giancola et al., 2009, 2010) with the ultimate goal of inhibiting aggressive behavior. All participants were seated in a room with a desk and a computer. For participants in the intervention condition, the room was also equipped with two large mirrors positioned directly in participants' line of sight and three cameras. The first camera was a tripod camera linked to a closed-circuit television screen (both visible to the participants) that displayed participants' behavior in real-time. In addition, two security cameras were mounted on the wall to the left of the

participants' desk. Participants also received a drink coaster with the imprinted slogan "what does my behavior say about me?" The mirrors, cameras, slogan, and visual display of participants' behavior served as inhibitory, self-relevant cues and further invoked the real-world effect of security cameras and coasters with slogans that can be used in the bar setting. For participants in the control condition, the room was equipped with only a desk, a computer, and a blank drink coaster; these aforementioned inhibitory, self-relevant cues were not present.

Procedure

Participants presented to the laboratory on two separate days. Upon arrival to Session 1, participants were asked to present a picture ID and informed consent was obtained. Participants' height, weight, and breath alcohol concentration (BrAC) were then assessed. Next, all participants completed a battery of questionnaires in an individual testing room. Included in this battery was a written version of the telephone screening measures to re-establish eligibility. Upon arrival to the laboratory for Session 2, which occurred within two weeks, participants provided informed consent and all eligibility criteria were re-verified. Participants also completed the AUDIT at this time. In order to disguise the task as a measure of aggression, participants were informed that the purpose of the study was to examine the relation between alcohol and reaction time under competitive conditions. As such, they were informed that they would consume an alcoholic beverage prior to engaging in a competitive reaction time task. Participants were led to an individual testing room, at which time the experimenter identified an adjacent room where the "opponent" was ostensibly seated.

Participants were then led to a small experimental room that was either equipped or not equipped with the intervention cues and given instructions for the competitive reaction time task. They were informed that shortly after the words "Get Ready" appeared on the screen, the words "Press the Spacebar" would appear at which time they had to press, and hold down, the spacebar. Following this, the words "Release the Spacebar" would appear at which time they had to lift their fingers off of the spacebar as quickly as possible. A "win" was signaled by the words *"You Won. You Get to Give a Shock"* and a "loss" was signaled by the words *"You Lost. You Get a Shock."* A winning trial allowed participants to deliver a shock to their opponent and a losing trial resulted in receiving a shock from their opponent. Participants were told that they had a choice of 10 different shock intensities to administer at the end of each winning trial for a duration of their choosing. Participants could not elect to not shock their opponent. However, participants were told that shock button "#1" would deliver a low intensity shock that is best characterized as "very mild" and "definitely not painful."

Following these instructions, participants received their alcoholic beverages. Participants were given twenty minutes to consume two drinks consisting of an overall dose of 0.99 g/kg body weight of 95% ethanol USP mixed in a 1:5 ratio with Tropicana orange juice. This dose was chosen because it reliably produces BrACs between .08%–.12% within 20 minutes of beverage consumption. The beverage was poured into two glasses in equal quantities.

Next, an assessment of participants' pain thresholds was conducted. First, participants were informed that their opponent would undergo the threshold assessment and that they would be able to hear their opponent's responses to the procedure over an intercom. In actuality, a female confederate answered the experimenter's questions regarding the testing of her pain thresholds in accordance with a list of predetermined responses. Next, participants were instructed to inform the experimenter when the shocks they received were "first detectable" and then when they reached a "painful" level. Short-duration shocks (1 second) were then administered in an incremental stepwise intensity method from the lowest available shock setting, which is imperceptible, until the shocks reached a reportedly painful level. All shocks were administered through two finger electrodes attached to the index and middle fingers of the nondominant hand using Velcro straps. The experimenter was in the adjacent control room and communicated with the participant through an intercom.

Participants BrACs were then assessed until they reached .08, at which time they received the gender-relevant provocation from the confederate. Next, they were given written instructions for the competitive reaction time task and began the aggression task. The reaction time task consisted of two successive blocks of trials (34 trials total). During the first block, participants received shock intensities between "1" and "2" after they lost a trial. During the next block, they received shock intensities between "9"and "10" after they lost a trail. Each block consisted of 16 trials (8 wins and 8 loses). There were two transition trials between the blocks in which participants "lost" and received shock intensities of "5" and "6," respectively. These two trials were added to provide a smooth transition between the low and high provocation blocks. All shocks delivered to participants were one second duration. In actuality, reaction time was not measured and the competitive task was used to lead participants to believe that they were engaging in an adversarial interaction with a woman. The win/loss sequence was predetermined and presented in a fixed-random order with trials interspersed by five-second intervals. A computer controlled the initiation of trials, administration of shocks to the participants, and the recording of their responses.

Upon completion of the aggression task, BrACs were measured for all participants. They were asked a variety of questions to indirectly assess the credibility of the experimental manipulation (see "Manipulation Checks" below). All participants were then fully debriefed regarding the use of deception and experimental aims, provided an opportunity to discuss any concerns or questions, and compensated at the rate of $10 per hour. Participants remained in the laboratory until their BrAC fell to .04%, at which time they were escorted to prearranged transportation by laboratory staff. Immediately prior to being discharged from the laboratory, participants were given psychoeducational materials about the potential problems and harms of heavy drinking, information pertaining to clinical intervention for heavy drinking, and referrals (as appropriate based on participant's individual AUDIT score) by the experimenter.

Results

Manipulation Checks

Prior to debriefing, participants were asked to describe their impression of their opponent and whether or not the task was a good measure of "reaction time." As noted above, four

participants were removed from analyses because they reportedly did not believe they were competing against another individual and/or that the task was a measure of reaction time. In order to ensure participants attended to the intervention cues, all participants were asked to complete a 10-item questionnaire immediately after they completed the TAP. Sample items included “There was a phrase written on my drink coaster” and “I could not see my reflection during the study.” Results of this assessment indicated that all of the participants in the intervention condition correctly answered the majority of the questions.

Preliminary Analyses

All participants tested in this study had BrACs of .00% upon entering the laboratory. A 2 (Condition) × 2 (Time) repeated measures ANOVA was conducted to verify that there were not significant differences in BrAC ratings between the intervention and control conditions over the course of the aggression task. Results of this analysis confirmed this assumption; a main effect of condition or Condition × Time interaction was not detected. As expected, a main effect of time revealed that participants’ mean BrAC immediately following the TAP (M = .11%, SD = .019%) was significantly higher than their mean BrAC before the administration of the gender-relevant provocation (M = .09%, SD = .014%), $F(1, 92) = 289$, $p < .001$. Inspection of these data at the individual level confirmed that all intoxicated participants were on the ascending limb of the BrAC curve during the experimental procedures.

On average, participants reported that they consumed 6.19 (SD = 1.28) alcoholic drinks per drinking day and consumed alcohol 3.44 (SD = 1.51) days per week. To confirm equal distribution of pertinent variables across the experimental groups, a series of independent samples t-tests were conducted with pertinent demographic characteristics (e.g., age, years of education, yearly income), past alcohol use (i.e., frequency and quantity alcohol consumption), masculine gender role stress, and aggression (i.e., dispositional physical aggression, minor physical aggression toward women during the past year). No significant group differences emerged. Chi-square analysis did not detect a significant difference in the racial composition or marital status of the experimental groups.

Regression Analyses

Because masculine gender role stress is a continuous variable, hierarchical linear regression analyses were indicated to test for moderation (Cohen, Cohen, West, & Aiken, 2003). As such, masculine gender role stress scores (M = 55.81, SD = 32.62) were mean centered by subtracting the mean score of the variable from the raw score of the variable. Intervention condition was dummy coded as follows: control group = 0, intervention group = 1. Interaction terms were calculated by obtaining the cross-products of pertinent first-order variables. For each hierarchical analysis, main effects of intervention manipulation group and masculine gender role stress were entered first (Step 1) and their interaction was entered second (Step 2). This resulted in a full model comprising three variables. To explicate significant interaction terms, regression coefficients for simple effects were examined at high (+1 SD), mean, and low (−1 SD) levels of masculine gender roles stress (MGRS) to determine whether they were significantly different from zero (Cohen et al., 2003).[1]

Effects of Masculine Gender Role Stress on the Relation Between Intervention and Alcohol-Related Physical Aggression

In Step 1, the regression model was significant, $F(2, 91) = 4.37$, $p = .02$, $R^2 = .09$. Intervention condition was the only significant main effect in the model ($\beta = -.288$, $p < .01$). This indicated that men who received the intervention manipulation, relative to control, enacted significantly less alcohol-related physical aggression toward the female confederate.

In Step 2, the regression model was significant, $F(3, 90) = 6.17$, $p < .01$, $R^2 = .17$. The interaction effect between intervention manipulation condition and masculine gender role stress was significant ($\beta = .42$, $b = .031$, $SE = .01$, 95% CI of $b = 0.01, 0.05$, $p < .01$). Examination of this interaction indicated that, relative to control, the intervention manipulation was associated with significantly lower levels of alcohol-related physical aggression among men who endorsed low ($\beta = -.58$, $b = -2.00$, $SE = .47$, 95% CI of $b = -2.94, -1.06$, $p < .01$) and mean ($\beta = -.29$, $b = -1.00$, $SE = .34$, 95% CI of $b = -1.65, -0.32$, $p < .01$) levels, but not high levels ($\beta = .007$, $b = .023$, $SE = .47$, 95% CI of $b = -0.92, 0.97$, $p = .96$), of masculine gender role stress (Figure 2). Thus, among men who reported lower levels of masculine gender role stress, the intervention manipulation exerted a large and inhibitory effect on alcohol-related physical aggression toward women (Cohen, 1992)[2].

Discussion

The primary aim of the present investigation was to directly examine a theoretically-based, self-awareness intervention manipulation for reducing at-risk men's alcohol-related aggression toward women. This aim was developed in response to a critical need to address barriers to interventions for alcohol-related aggression (Giancola et al., 2009, 2010; McMurran, 2013). This literature called for research to empirically investigate (1) specific intervention techniques that reduce aggression, and (2) in whom such interventions will have the greatest impact.

Effects of the Intervention Manipulation on Alcohol-Related Physical Aggression

As expected, results of this study evidenced that the self-awareness intervention manipulation, relative to control, was associated with less alcohol-related physical aggression toward a female confederate. This is consistent with past findings that self-awareness manipulations reduce intoxicated aggression (Bailey et al., 1983; Berman et al., 2009) and that cognitive distraction manipulations reduce attention toward aggression stimuli and physical aggression among provoked, intoxicated men (Gallagher & Parrott, 2011; Giancola & Corman, 2007). Of import, this finding incrementally advances this line of work by using a theoretically-based self-awareness intervention manipulation, a high risk community sample of heavy drinking males, and a gender-relevant masculinity threat from a female confederate. Indeed, most controlled studies designed to reduce alcohol-related

[1]Dispositional physical aggression and minor physical aggression were not added as moderators due to inadequate statistical power to detect a three-way interaction (Faul, Erdfelder, Lang, & Buchner, 2007).

[2]Analyses were also conducted to examine whether provocation during the TAP moderated the observed effects. Using the Sum/Difference method (Judd, Kenny, & McClelland, 2001), analyses did not detect any significant interaction effects involving provocation and, in particular, did not detect a significant Intervention Manipulation × Masculine Gender Role Stress × Provocation interaction ($\beta = .13$, $b = .005$, $SE = .006$, 95% CI of $b = -0.07, 0.018$, $p = .394$).

aggression (Gallagher & Parrott, 2011; Giancola & Corman, 2007) have used computerized distraction tasks that are unlikely to be implemented into the bar or similar public setting. Moreover, although studies that examine the acute effects of alcohol on aggression or other risk behaviors have included heavy episodic drinkers (e.g., Davis, Hendershot, George, Norris, & Heiman, 2007; Morean, Corbin, & Treat, 2015), the present study was the first to recruit a sample comprised *entirely* of heavy episodic drinkers. Thus, the present study demonstrates the efficacy of an intervention manipulation for a subset of drinking males at increased risk to perpetrate aggression toward women (Leonard, 2005).

The present result can be interpreted within the framework of the attention-allocation model of alcohol myopia theory (Steele & Josephs, 1990). According to this theory, alcohol intoxication facilitates attentional focus toward salient instigatory cues (e.g., provocation from a woman) that promote aggressive behavior, which in turn, shifts attentional focus away from less salient inhibitory cues (e.g., social proscriptions against aggression toward a woman) that discourage aggressive behavior. The attention-allocation model has largely been used to explain why alcohol increases aggressive behavior; however, this model also makes the counterintuitive prediction that alcohol may *decrease* aggressive behavior, even below that of *sober* individuals. In a situation where non-provocative cues are most salient, alcohol myopia theory states that 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 line with these tenants, this finding suggests that the inhibitory cues of the intervention manipulation were highly salient and thus facilitated a shift in attention away from the instigatory cues present in the environment (i.e., provocation from the woman). If this is the case, the intervention cues hijacked the alcohol myopia of these men and led to their lower levels of aggression. This finding provides data to support the first endeavor set forth by the field to empirically investigate specific intervention techniques associated with lower levels of aggressive behavior. If future studies can replicate and build upon this finding, direct implementation of cues that heighten self-awareness into the bar or similar public setting may have a substantial impact on men's alcohol-related aggression toward women.

Effects of Masculine Gender Role Stress on the Relation Between the Intervention Manipulation and Alcohol-Related Physical Aggression

The present study also sheds light on persons for whom the attention-allocation inspired intervention might have the greatest impact. Contrary to expectations, results evidenced that the intervention manipulation was associated with less alcohol-related aggression toward women for men who reported *lower*, but not higher, levels of masculine gender role stress. This result indicates that the intervention cues were only effective at reducing alcohol-related aggression toward women in men who cognitively appraise gender-relevant situations as less threatening (Copenhaver et al., 2000; Eisler et al., 2000; Jakupcak, Lisak, & Romer, 2002; Moore et al., 2008).

In hindsight, however, this result is not surprising. The present sample was comprised solely of men who possessed two robust predictors of aggression toward women: a pattern of heavy drinking (Leonard, 2005) and acute alcohol intoxication (Chermack & Blow, 2002; Murphy,

Winters, O'Farrell, Fals-Stewart, & Murphy, 2005). Furthermore, this study implemented a gender-relevant provocation in an already adversarial encounter (i.e., provoked aggression trials of the TAP). Indeed, provocation is one of the greatest elicitors of aggression (e.g., Anderson & Bushman, 2002; Bettencourt & Miller, 1996; Giancola et al., 2002) which was only compounded further by the masculinity threat perpetrated by the female confederate (Vandello et al., 2008). As such, it can be argued that the self-awareness intervention manipulation was associated with lower levels of aggression toward women for men who possessed a "triple threat" of risk factors (i.e., heavy alcohol use, acute intoxication, and exposure to significant provocation), but not for men who possessed a "quadruple threat" of risk factors (i.e., the addition of a higher level of dispositional masculine gender role stress).

The ineffectiveness of the intervention manipulation for high gender role stress men may be due to their heightened sensitivity to the masculinity threat perpetrated by the female confederate. Indeed, masculine gender role stress has been directly associated with men's aggression toward women (e.g., Eisler et al., 2000; Moore et al., 2008). Furthermore, pertinent theory contends that masculine gender role stress reflects men's tendency to experience the insecurity, defensiveness, personal weakness, and stressful discontent that may be a central motivation for aggression toward women (Cowan & Mills, 2004; Malamuth, Linz, Heavey, Barnes, & Acker, 1995). Given this, it is possible that the instigatory cues of the gender-relevant provocation were more salient than the inhibitory cues of the intervention manipulation.

Alternatively, it is possible that the self-awareness intervention cues backfired, and myopically focused higher masculine gender role stress men's attention *onto* their appraisal of the masculinity threat. In doing so, the mirrors, cameras, and coaster slogan may have prompted these men to aggress toward the woman in order to prove or even save their threatened masculinity. This finding provides initial data to support the second endeavor set forth by the field to empirically identify in whom particular interventions may have the greatest impact; however, it is imperative that future work explore further these individual risk factors. Collectively, this unexpected result highlights the view that individuals differ in what they perceive to be salient as well as in their dominant response to a given salient cue (K. Leonard, personal communication, August 13, 2013).

Limitations

The present study only measured dispositional masculine gender role stress; participants' state masculine gender role stress and affect were not assessed prior to or during the aggression task. As such, definitive conclusions regarding the impact of masculine gender role stress cannot be made. Additionally, this project would have ideally assessed baseline levels of aggression on the Taylor Aggression Paradigm in order to demonstrate that aggression decreases following the intervention manipulation. However, there are methodological and feasibility issues that complicate the use of a pre-test/post-test design. Most notably, during the Taylor Aggression Paradigm, all participants receive escalating levels of shock designed to provoke participants during an increasingly adversarial interpersonal interaction. Thus, heightened provocation at pre-test would have carried over (and thus potentially confounded) subsequent post-test assessments of aggression. Although

this issue does not preclude the use of a pre-test/post-test design with the Taylor Aggression Paradigm, reconciling this methodological issue would have required multiple studies and/or a larger sample than the present project could allow. Related to this limitation, in addition to escalating shocks, participants also received a verbal, gender-relevant provocation. The aim of this methodology was to determine whether a self-awareness intervention manipulation could reduce aggression in response to a very powerful, gender-relevant provocation. While successful, this method is limited by its inability to disentangle the effect of these distinct forms of provocation on aggression. Moreover, and perhaps more importantly, it is unclear the extent to which the self-awareness intervention attenuates aggression-promoting effects associated with each type of provocation.

Furthermore, the present study did not directly test the proposed intervening processes (e.g., self-awareness, anger, hostile rumination) by which attentional biases increase (or decrease) the probability of an aggressive response (Giancola et al., 2010). As a consequence, this study is unable to dismantle the active ingredients of the intervention manipulation to determine why the intervention cues were associated with lower levels of alcohol-related aggression toward a female confederate. Future studies may employ in vivo measures of attention, cognition, and affect to directly test the mechanisms that mediate these effects (Eckhardt, Parrott, & Sprunger, 2015).

The present sample was largely African-American (77%) and reported a mean yearly income of slightly less than $20,000. Such demographic factors, which are likely associated more broadly to community context and disadvantage, are associated with greater risk for alcohol-related aggression (Topalli et al., 2014; Zinkiewicz, Curtis, Meurer, & Miller, 2015). The exact mechanisms underlying this effect remain elusive, but potentially include socialization (Kliewer et al., 2006) and stress related to disadvantage (Brody et al., 2003). Thus, while it seems that attention-based interventions are effective in a demographically high risk sample, the robustness of this effect still merits evaluation in more diverse samples where the underlying mechanisms of alcohol-related violence may vary. Finally, due to an undetected procedural error, masculine gender role stress was not included in the Urn randomization procedure. Although experimental groups did not differ on this variable, it is important to acknowledge this oversight.

Clinical and Research Implications

It is well established that alcohol is a contributing cause of men’s aggression toward women (Abbey et al., 2005; Leonard & Quigley, 1999). However, only recently has research demonstrated that cognitively focused manipulations (e.g., cognitive distraction) are effective at reducing alcohol-related aggression (Gallagher & Parrott, 2011; Giancola & Corman, 2007). Findings from the present study provide support for the development of more ecologically-valid interventions proposed by Giancola and colleagues (2009, 2010) that aim to redirect intoxicated men’s attention toward stimuli that is non-aggressive, non-provocative, and/or prohibitive of aggressive behavior. Importantly, however, data from this study evidenced that a self-awareness intervention manipulation may produce iatrogenic effects for at-risk men prone to appraisal biases about threats to their masculinity.

This finding indicates a critical need for individual and systemically-based interventions that focus on the stress men may face with regard to their masculine identity. Indeed, theorists have argued that disruptions in the development of a healthy masculine self originate from both societal and intrapsychic dynamics (Addis, 2011; Blazina, 2001). It is important that these issues be taken up with men in safe spaces (e.g., individual psychotherapy, men's social groups, supportive caregiver interactions) with the end goal of decreasing the interpersonal and intrapsychic forces that engender masculine gender role stress.

It is clear that continued intervention-based research for men's alcohol-related aggression toward women is greatly needed. Data from the current project are among the first in this burgeoning area. The field requires large-scale studies that can reconcile the aforementioned limitations and contribute further to this literature. The present study provides the field with a platform for which to base this future work.

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Public Health Significance

This study suggests that techniques that increase self-awareness effectively reduce alcohol-related aggression toward women for heavy-drinking men who report lower, but not higher, levels of masculine gender role stress.

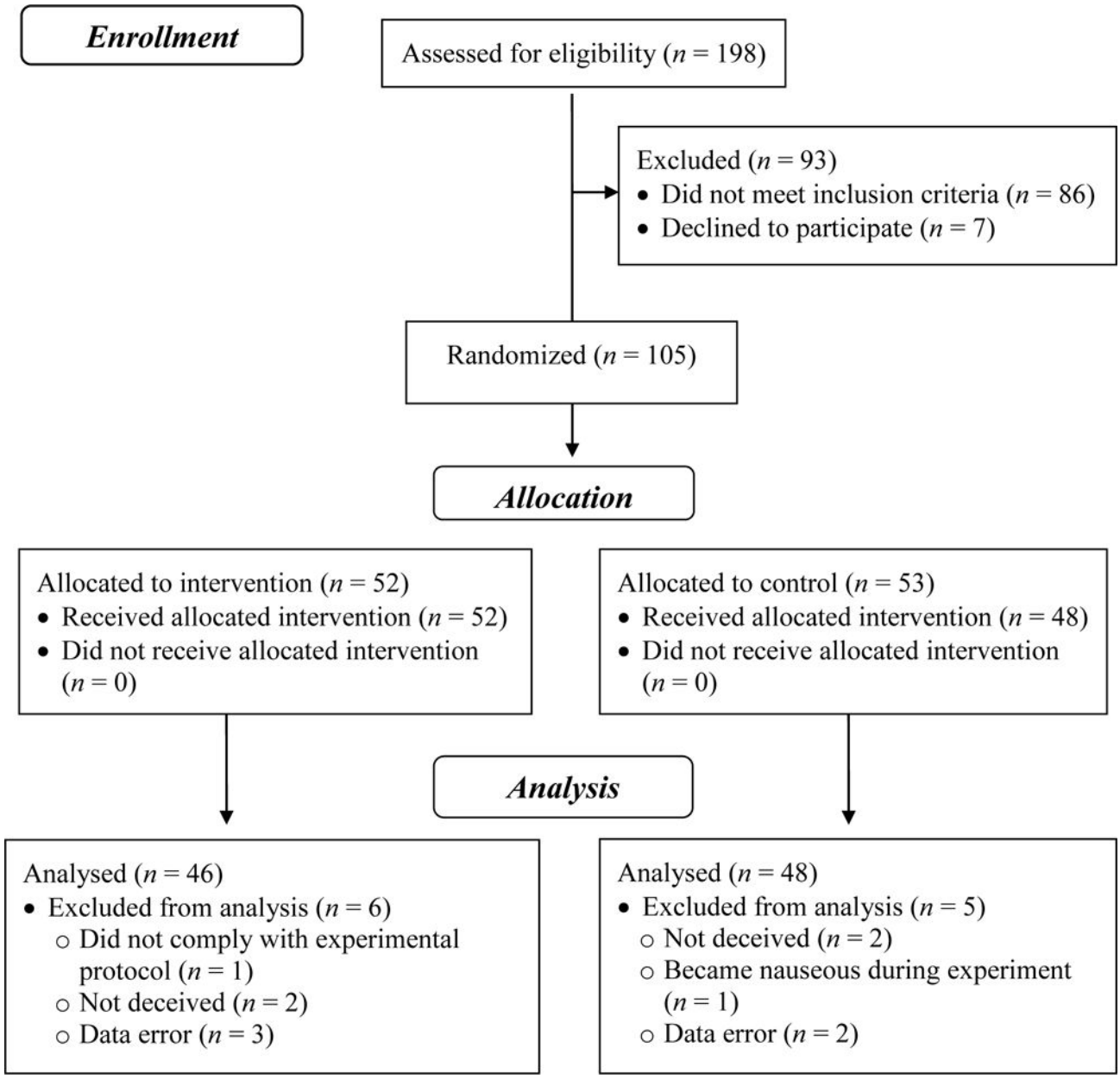

Figure 1.
Consort diagram.

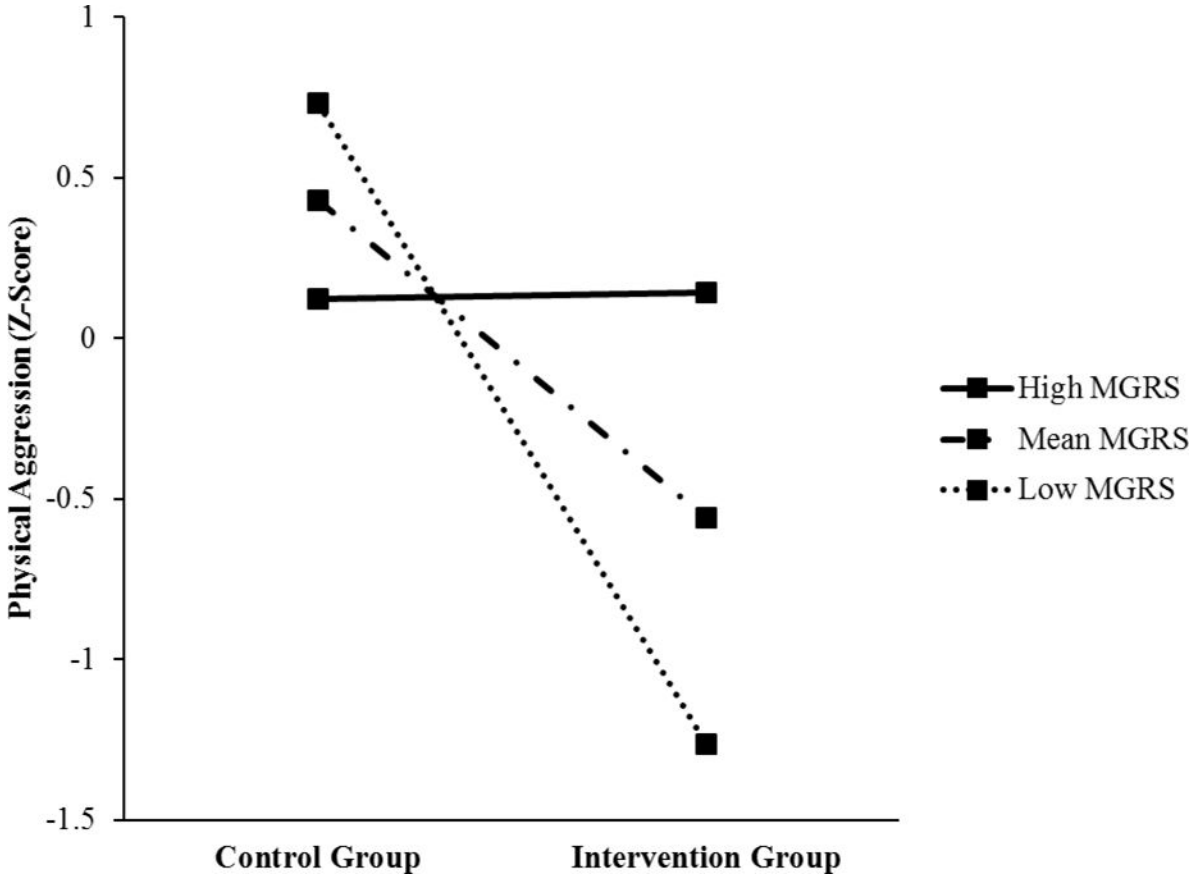

Figure 2.

Relation between the intervention manipulation and alcohol-related physical aggression at high (+1 *SD*), mean, and low (−1 *SD*) levels of masculine gender roles stress (MGRS).