Belief in the American Indian/Alaska Native Biological Vulnerability Myth and Drinking to Cope: Does Stereotype Threat Play a Role?

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Abstract

Objectives: The effects of stereotype threat and internalized alcohol stereotypes on negative affect and negative affect-related drinking have not been examined in American Indians/Alaska Natives (AI/ANs), despite their frequently being subjected to alcohol stereotypes. The current study examined the association of belief in the myth of an AI/AN specific biological vulnerability (BV) with alcohol consequences through its effect on depression and drinking to cope with negative affect. **Method:** In this cross-sectional study, a moderated mediation model examined the association of belief in a BV with alcohol consequences via sequential mediators of depression and drinking to cope. It was hypothesized that the positive association of belief in a BV with depression would be stronger among individuals who engaged in more frequent heavy episodic drinking. Participants were 109 female (69.9%) and 47 male (30.1%) AI/AN college students (M_{age} = 27.1 years, range 18 to 61) who reported having at least one drink in the past month. **Results:** Belief in a BV was positively associated with depression symptoms among participants reporting average or high frequency of heavy episodic drinking. Greater depression symptoms predicted greater drinking to cope, which in turn predicted greater alcohol consequences. **Conclusion:** Belief in the BV myth may act as a type of stereotype threat, contributing to alcohol consequences by increasing negative affect and drinking to cope. These results suggest that for AI/ANs who drink, there are psychological and behavioral health ramifications of believing in the notion of a BV, and a need to debunk this myth.

Keywords: stereotype threat, alcohol consequences, American Indian/Alaska Native, firewater myth, drinking to cope, limit violation effect

Public Significance Statement

Believing stereotypes about your own group (e.g., gender, race) has been shown to negatively affect mood and performance. In this study, American Indian/Alaska Native (AI/AN) participants who had greater belief in the unfounded stereotype that AI/AN people have a unique biological vulnerability to alcohol problems experienced more depression, drinking to cope with negative emotions, and alcohol consequences.

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American Indians and Alaska Natives (AI/ANs) have higher rates of current and lifetime abstinence than non-AI/ANs in the United States (Beals et al., 2003; Cunningham, Solomon, & Muramoto, 2016). Despite high rates of abstinence, there is also evidence of significant alcohol-related health disparities for AI/ANs based on national data. Among those who drink, there is evidence of greater alcohol consumption (Beals et al., 2003; Vaeth, Wang-Schweig, & Caetano, 2017) as well as greater alcohol-related morbidity and mortality, higher rates of alcohol use disorder (AUD), and greater severity of AUD for AI/ANs than for non-AI/ANs (Centers for Disease Control and Prevention, 2008; Grant et al., 2015; Vaeth et al., 2017; Whitesell, Beals, Crow, Mitchell, & Novins, 2012). Further, while there is evidence that AI/ANs demonstrated a modest decrease in prevalence of alcohol use and binge drinking from 2000 to 2016 (Grucza et al., 2018), from 1999 to 2017 AI/ANs also evidenced the largest increase in alcohol-related deaths (Spillane et al., 2020; White, Castle, Hingson, & Powell, 2020). Given the significant alcohol-related health disparity for AI/ANs, a better understanding of factors that may affect problematic alcohol use is needed. However, it also is important to note that alcohol-related health disparities vary widely by tribe and region (e.g., Blake, Holck, & Provost, 2016; Whitesell et al., 2012). Given that there are more than 600 current state- or federally-recognized AI/AN tribes, national averages do not represent those of any particular community.

While some non-Native U.S. minority groups also evidence disproportionately higher rates of negative consequences from substance use (see Chartier & Caetano, 2010 for a review), AI/ANs in particular are often subjected to biological and genetic explanations for health disparities related to alcohol (Skewes & Lewis, 2016). However, there is little evidence that

biological or genetic differences explain alcohol-related health disparities among AI/ANs (Ehlers & Gizer, 2013; Enoch & Albaugh, 2017). In contrast, there is evidence that alcohol-related health disparities are associated with the lasting effects of historical trauma (e.g., violent colonization and forced assimilation that disrupted family structures and traditional wellness practices) as well as contemporary traumas, including discrimination and sociocultural inequalities that negatively affect health (Davis et al., 2018; Dickerson et al., 2018; Enoch & Albaugh, 2017; Grant et al., 2015; Whitesell et al., 2012). For example, research controlling for demographic variables such as age, education, and income have found comparable rates of alcohol use among AI/ANs and Whites who drink, as well as comparable rates of AUD (Brave Heart et al., 2016; Cunningham et al., 2016).

Negative Effects of Stereotypes

Despite a lack of compelling evidence to support the notion that AI/AN people have a specific biological vulnerability (BV) to alcohol problems (aka the "*firewater myth"*[1]), a recent study found that AI/AN college students still commonly believed in this notion (Gonzalez & Skewes, 2018). This is problematic because holding this belief is associated with greater guilt for drinking small amounts of alcohol, lower self-efficacy for avoiding heavy drinking, greater heavy drinking, and greater negative alcohol consequences (Gonzalez & Skewes, 2016). Endorsing this belief also is associated with less frequent use of protective behavioral strategies for avoiding alcohol-related consequences, thereby contributing to greater alcohol use and

[1] This phrase has been used to refer to variations on the notion that alcohol affects AI/AN peoples differently than people of European ancestry (e.g., Blume, 2016; La Marr, 2003; Leland, 1976; Mail & Johnson, 1993; Schaefer, 1981). The naming of this myth follows a practice of some research examining the effects of negative stereotypes about minority groups, which uses loaded terms to refer to these stereotypes. The phrase evokes the stereotype to which it refers as well the injustice and oppression behind it. Given its association with a painful history and stereotype, judicious use is called for.

consequences (Gonzalez, Bravo, Crouch, & Protective Strategies Study Team, 2019), and with using less effective alcohol control strategies (Gonzalez & Skewes, 2018). Thus, there is converging evidence that this belief negatively affects alcohol-related behavior. To better understand the potential effects of belief in a BV on AI/ANs, it is important to consider how this belief may represent an internalized stereotype or oppression, as well potentially contributing to stereotype threat, both of which are damaging and may themselves contribute to alcohol problems among AI/AN peoples.

Stereotypes are widely held and oversimplified beliefs about groups of people (Spencer, Steven, Steele, & Quinn, 1999; Steele & Aronson, 1995). Often pejorative in nature, stereotypes have long been demonstrated to negatively impact the individuals and communities who are their targets (Cohen & Garcia, 2005; Hatzenbuehler, 2016; Jerald, Cole, Ward, & Avery, 2017; Rivis & Sheeran, 2013; Steffensmeier, Ulmer, & Kramer, 1998). Negative effects of stereotypes include impaired academic performance (Spencer et al., 1999; Steele, 1997; Steele & Aronson, 1995), diminished psychological well-being (Atkin, Yoo, Jager, & Yeh, 2018; Cohen & Garcia, 2005; Harrington, Crowther, & Shipherd, 2010; Kim, Wang, Deng, Alvarez, & Li, 2011), and negative health outcomes (Hatzenbuehler, 2016; Jerald et al., 2017).

When a member of a group comes to believe that stereotypes held about their own group are true, stereotypes and oppression have become internalized. Believing or personally identifying with stereotypes about one's social group is harmful (for a review, see David & Derthick, 2014). Internalized racial oppression and stereotypes have been found to be associated with greater depression in a number of different ethnic groups (Campón & Carter, 2015; Capielo Rosario, Schaefer, Ballesteros, Rentería, & David, 2019; David & Okazaki, 2006; Utsey, Abrams, Opare-Henaku, Bolden, & Williams, 2015). While many AI/ANs have internalized the

stereotype of a BV to alcohol problems (Gonzalez & Skewes, 2016, 2018), no studies to date have examined how this stereotype may similarly affect depressive symptoms. Such an association could help to explain the association of belief in a BV with greater alcohol consequences, as both cross-sectional and prospective research studies demonstrate that depression predicts drinking to cope with negative affect, which in turn predicts greater alcohol consequences (Gaher, Simons, Jacobs, Meyer, & Johnson-Jimenez, 2006; Gonzalez, Bradizza, & Collins, 2009; Gonzalez, Reynolds, & Skewes, 2011; Holahan, Moos, Holahan, Cronkite, & Randall, 2003; Kenney & Holahan, 2008; Peirce, Frone, Russell, & Cooper, 1994; Schuckit, Smith, & Chacko, 2006). Further, depression is both a predictor of less favorable alcohol treatment outcomes and of relapse following alcohol treatment (Witkiewitz & Villarroel, 2009). Thus, factors that increase depression may contribute to AI/AN alcohol-related health disparities.

Stereotype Threat and Drinking Restraint Model

In addition to affecting mood and mental health, stereotypes also affect performance and self-regulation. The tendency to feel worry or anxiety over the prospect of conforming to a stereotype that has been associated with one's social group is called *stereotype threat* (Steele, 1997). Stereotype threat paradoxically leads to stereotype-confirming behavior due to the anxiety and preoccupation experienced when one encounters domains specific to the stereotype (Pennington, Heim, Levy, Larkin, & Pennington, 2016; Schmader, Johns, & Forbes, 2008; Spencer, Logel, & Davies, 2016). This is believed to occur due to the negative effects of stereotype threat on the cognitive and emotional resources needed to successfully complete a task that the person would otherwise be capable of completing (Inzlicht, McKay, & Aronson, 2006; Pennington et al., 2016; Schmader et al., 2008; Steele, 1997). For example, women under high stereotype threat conditions perform significantly worse on math tests compared to men,

whereas women perform equally to men under low stereotype threat conditions (Spencer, Steele, & Quinn, 1999). Stereotype threat has rarely been examined in the area of alcohol or substance use and has not been examined in relation to actual drug or alcohol outcomes; however, stereotype threat among alcohol and substance abusers has been shown to be associated with greater depression as well as detriments in cognitive test performance and social functioning (Cole, Michailidou, Jerome, & Sumnall, 2006; Looby & Earleywine, 2010; Pennington, Qureshi, Monk, & Heim, 2016; von Hippel et al., 2017). Further, few studies have examined stereotype threat in AI/ANs. In AI/AN adolescents, stereotype threat is associated with both lower math scores and greater hopelessness (Jaramillo et al., 2016).

Given the notion of a BV, as well as potential concern about behaving consistently with alcohol-related stereotypes (May, 1996), some AI/ANs might be especially motivated to avoid alcohol use altogether or to closely monitor their use. Consistent with this idea, Gonzalez and Skewes (2016) found that belief in a BV was associated with greater attempts to control drinking, but also was associated with greater alcohol consumption and consequences. Given that preoccupation with suppressing an activated stereotype can inhibit working memory and disrupt self-control (Schmader et al., 2008), the activation of alcohol-related stereotypes may elicit a negative affective state and impair attempts at self-control (i.e., regulation of alcohol consumption), contributing to greater drinking and alcohol consequences. That is, believing in a BV may function as a type of stereotype threat and affect mood and drinking behavior among AI/ANs.

The drinking restraint model (Collins, 1993) provides a complementary explanation for how preoccupation with a need to restrain drinking, whether due to concern about confirming a negative stereotype or due to concern that one is vulnerable to developing an alcohol problem,

may lead to distress that results in an increase rather decrease in drinking. According to the drinking restraint model, when individuals are preoccupied with limiting their drinking, perceiving themselves to be violating personal alcohol limits contributes to distress that in turn leads to greater drinking, presumably to cope with this distress, via the *limit violation effect* (Collins, 1993; Muraven, Collins, Morsheimer, Shiffman, & Paty, 2005b). Belief in a BV may result in concern for the need to restrain drinking as well as distress among those who perceive themselves to be drinking excessively, leading to drinking to cope with negative affect. Such an association would be particularly concerning, as drinking to cope is associated with greater drinking-related consequences compared to other motives for drinking (Beseler, Aharonovich, Keyes, & Hasin, 2008; Cooper, Frone, Russell, & Mudar, 1995; Hammarberg et al., 2017; Kuntsche et al., 2008; Mezquita et al., 2011; Molnar et al., 2010). In the case of alcohol-related stereotypes regarding AI/AN peoples, the limit violation effect (attempting to restrain drinking, but failing to do so) and stereotype threat may have a synergistic effect that compounds negative affect predicted by both models and lead to greater drinking to cope, thereby contributing to greater alcohol consequences.

Current Study

No studies to date have examined the effects of stereotype threat on drinking, and very few studies have examined the effects of stereotype threat on AI/ANs (Cole et al., 2006; Jaramillo et al., 2016; Looby & Earleywine, 2010; Pennington et al., 2016; von Hippel et al., 2017). Stereotype threat and the drinking restraint model suggest that belief in a BV may contribute to negative affect among AI/ANs who consume alcohol, particularly among individuals who may perceive themselves to be violating personal drinking limits, which in turn may result in greater drinking to cope with negative affect and alcohol consequences. In this

study, we hypothesized that belief in a BV would be associated with greater depression symptoms, and that this association would be particularly pronounced among those who drink more heavily. We further hypothesized that depression symptoms would be associated with greater drinking to cope with negative affect, and in turn with greater alcohol consequences.

Method

Participants

Data for the current study were drawn from a larger study on factors affecting non-abstinent AI/AN college students' attitudes toward abstinence-only and harm reduction-based alcohol interventions (Gonzalez & Skewes, 2016, 2018). Participants were 156 AI/AN male (30.1%, n = 47) and female (69.9%, n = 109) college students from two large, open enrollment universities in different regions of Alaska who reported having had at least one drink in the past month. About 81% of participants reported being Alaska Native, 16% reported being American Indian, and 3% reported being Alaska Native and American Indian. Participants' mean age was 27.09 years (SD = 9.18), with a range from 18 to 61 years of age; 73.1% of the sample was under 30 years old. The majority (73.5%) were full-time students. In addition to college classes, 44.6% were employed part-time (less than 40 hrs/week) and 11.5% were employed full-time, with 43.9% who were not employed. Most participants reported that both parents had at least a high school education, 18.5% reported that one or both parents did not, and 43.9% reported that one or both parents had a college degree.

Procedures

Institutional Review Boards of both universities where the study was conducted approved the study protocol. Participants were recruited via email solicitations, fliers, in-class announcements, and advertisements in the school newspapers. Advertisements directed potential

participants to a webpage that screened for eligibility. Inclusion criteria included self-identifying as (a) AI/AN; (b) a college student; (c) age 18 or older; and, (d) a current drinker, defined as having consumed one or more standard alcoholic drinks in the 30 days prior to screening. Self-identification as either AN or AI was used as an eligibility criterion in this study because the myth of a BV has been broadly applied to all AI/AN peoples. Eligible individuals were scheduled for a single, in-person data collection session on their respective campus. After providing written informed consent, study materials were presented in random order on laptop computers. Participants were compensated with a $25 Visa gift card for their time.

Measures

Belief in a biological vulnerability. The Revised Firewater Myth Scale (RFMS; Gonzalez & Skewes, 2016) includes a total of 14 items that refer to beliefs about AI/ANs embedded among 21 distractor items that refer to other ethnic and racial groups (e.g., African American, Hispanic, White/European American). A number of the distractor items were designed to parallel items that focused on AI/AN peoples (e.g., "Many African Americans don't drink at all"). For this study, the RFMS Biological Vulnerability (BV) subscale was used to measure belief in an AI/AN specific BV to alcohol problems. This subscale consisted of nine items rated from 1 (*strongly agree*) to 6 (*strongly disagree*). Example items include: "Alaska Natives and American Indians metabolize alcohol differently than non-Native people," and "Alaska Natives and American Indians are more likely to have a genetic vulnerability to problems with alcohol." To reduce the likelihood of reinforcing negative stereotypes and/or causing offence, items include reverse scored items that negate the notion of a BV or greater alcohol problems among AI/AN peoples. After appropriate reverse scoring, a mean score is calculated with higher scores indicating greater belief in an AI/AN BV to alcohol problems. The

BV subscale evidences convergent and divergent validity with beliefs about the nature of alcoholism (Gonzalez & Skewes, 2016). Cronbach's alpha for the BV subscale in the current sample was .85.

Depression. The Beck Depression Inventory-II (BDI-II; Beck, Steer, & Brown, 1996) is a widely used 21-item self-report scale that measures severity of depressive symptoms. Items are rated from 0 to 3, with higher scores indicating greater depressive symptoms. The BDI-II evidences high test-retest reliability, criterion validity, and convergent validity among university students (Sprinkle et al., 2002). Cronbach's alpha for the BDI-II in the current sample was .93.

Drinking to cope. The 5-item Coping Motives subscale of the Drinking Motives Questionnaire-Revised (DMQ-R; Cooper, 1994) was used to measure drinking to cope with negative affect. Respondents rated their relative frequency of consuming alcohol for negative affect-related motives (e.g., "To forget your worries") on a 5-point scale from 1 (*never/almost never*) to 5 (*always/almost always*). The subscale score represents a participant's mean rating across items. The Coping Motives subscale of the DMQ-R demonstrates good convergent and concurrent validity (Cooper et al., 1995; Stewart & Devine, 2000). The factor structure of the DMQ-R has been examined with Indigenous youth, which has confirmed coping motives as a distinct factor with strong loadings for each item and this subscale has evidenced good convergent validity (Mushquash, Stewart, Comeau, & McGrath, 2008; Mushquash, Stewart, Mushquash, Comeau, & McGrath, 2014). Cronbach's alpha for the Coping Motives subscale in the current sample was .84.

Alcohol consequences. The Young Adult Alcohol Consequences Questionnaire (YAACQ; Read, Kahler, Strong, & Colder, 2006) is a 48-item self-report inventory of common problems associated with alcohol use in college student populations. Items were rated

dichotomously as present (1) or absent (0) in the past year. The YAACQ has demonstrated high test-retest reliability, as well as good convergent, concurrent, and predictive validity with college students (Kahler, Strong, & Read, 2005; Read, Merrill, Kahler, & Strong, 2007). The full and brief versions of the YAACQ have likewise demonstrated convergent validity with AI/AN college students (Gonzalez et al., 2019; Skewes & Blume, 2015). The YAACQ total score was used to quantify alcohol consequences in the last year, and had a Cronbach's alpha of .96 in the current sample.

Alcohol use. Frequency of heavy episodic drinking was measured using two items modified from the National Institute of Alcohol Abuse and Alcoholism (NIAAA) alcohol consumption question set (Gonzalez et al., 2009, 2011; NIAAA, 2003). First, participants were provided with a handout that defined and depicted a standard drink (e.g., 12 oz. of beer, 5 oz. of wine, 8 to 9 oz. of malt liquor, or 1.5 oz. of 80-proof liquor). Participants then were asked to report the number of days on which they engaged in heavy episodic drinking (i.e., ≥ 4 standard drinks for a female or ≥ 5 standard drinks for a male on one occasion or sitting) during a typical month in the past year, with separate questions inquiring about drinking in social and in solitary contexts. Responses were summed to represent frequency of heavy episodic drinking during a typical month in the past year, regardless of context. In this sample, this measure of heavy episodic drinking evidences convergent validity via a strong correlation with alcohol consequences.

Analyses

Missing data were minimal, ranging from 0% to 3.2% across measures, and were the result of computer or administration errors rather than participants choosing to omit ratings. We eliminated five participants with missing data from the current study, resulting in the final

sample of 156 participants. To test the proposed moderated mediation model (see Figure 1) an analysis was conducted using the Hayes (2018) PROCESS macro (version 3.4). Bootstrap resampling (10,000 bootstrap samples) with percentile confidence intervals was used to test the significance of the indirect effects (see Hayes, 2018). In the model, it was hypothesized that there would be a positive association between belief in a BV and depression that would be moderated by heavy episodic drinking, such that greater heavy episodic drinking would be associated with a stronger association between belief in a BV and depression. Depression in turn was hypothesized to be associated with greater drinking to cope, leading to greater alcohol consequences. In order to improve normality and allow an examination of moderation (conditional) effects at ± 1 *SD* of the moderator, frequency of heavy episodic drinking was square root transformed prior to analyses. Heavy episodic drinking and belief in a BV were mean centered prior to analyses. Age and gender were entered as covariates in the analyses.

Results

Descriptives

Table 1 provides means, standard deviations, and intercorrelations of the study variables. In this study, the mean score for depression was 12.06 (*SD* = 10.12). According to BDI-II cutoff scores, 66.0% of the sample (*n* = 103) had minimal depression (total scores ≤ 13), 11.5% (*n* = 18) had mild depression (scores between 14 and 19), 13.5% (*n* = 21) had moderate depression (scores between 20 and 28), and 9.0% (*n* = 14) had severe depression (scores ≥ 29; Beck et al., 1996). Belief in a BV scores were normally distributed, and on average reflected at least slight agreement with the BV myth (*M* = 3.99, *SD* = 1.08). On average, participants reported 4.32 (*SD* = 5.94) episodes of heavy drinking during a typical month in the past year and endorsed an

average of 16.47 (*SD* = 12.42) alcohol consequences in the past year.

Moderated Mediation

In the moderated mediation model (see Figure 1 for standardized path coefficients), greater belief in a BV was significantly associated with greater depression, but this association was moderated by frequency of heavy episodic drinking (*B* [SE] = 2.34 [.54], 95% CI [1.26, 3.41], $p < .001$; see Figure 2). A probe of this interaction revealed that there was no significant association between belief in a BV and depression at low levels (1 *SD* below the mean) of heavy episodic drinking (*B* [SE] = -.99 [.93], 95% CI [-2.83, .86], $\beta = -.11$, $p = .292$). However, greater belief in a BV was associated with greater depression for individuals with average (*B* [SE] = 2.04 [.68], 95% CI [.68, 3.39], $\beta = .22$, $p = .003$) or high levels (1 *SD* above the mean) of heavy episodic drinking (*B* [SE] = 5.06 [1.03], 95% CI [3.02, 7.09], $\beta = .54$, $p < .001$). In the model, greater depression in turn was associated with greater drinking to cope (*B* [SE] = .04 [.01], 95% CI [.03, .05], $p < .001$). Drinking to cope, in turn, was associated with greater alcohol consequences (*B* [SE] = 6.85 [1.08], 95% CI [4.71, 8.99], $p < .001$). Percentile bootstrap results for the indirect effects of belief in a BV with drinking to cope through depression revealed significant moderation of the indirect effect (*B* [SE] = .09 [.03], 95% CI [.04, .16], $z = 3.02$, $p = .003$), with no significant indirect effect at low levels of heavy episodic drinking (*B* [SE] = -.04 [.04], 95% CI [-.13, .04], $z = -.89$, $p = .373$), but significant indirect effects at average (*B* [SE] = .08 [.03], 95% CI [.03, .15], $z = 2.51$, $p = .012$) and high levels of heavy episodic drinking (*B* [SE] = .20 [.06], 95% CI [.11, .33], $z = 3.51$, $p < .001$). There was also a significant direct association of greater belief in a BV with greater drinking to cope when controlling for the effects of depression (*B* [SE] = .13 [.06], 95% CI [.02, .24], $\beta = .16$, $p = .022$). There was a significant indirect effect of depression to greater alcohol consequences through drinking to cope

(*B* [SE] = .27 [.07], 95% CI [.16, .42], *z* = 4.11, *p* < .001), but no direct effect of depression to alcohol consequences when controlling for drinking to cope (*B* [SE] = .17 [.09], 95% CI [-.02, .35], *p* = .075). There were sequential indirect effects from belief in a BV to alcohol consequences through depression and drinking to cope that were moderated by heavy episodic drinking (*B* [SE] = .64 [.23], 95% CI [.26, 1.17], *z* = 2.73, *p* = .006), such that no significant indirect was found for those low in heavy episodic drinking (*B* [SE] = -.27 [.31], 95% CI [-.97, .28], *z* = .86, *p* = .388), but significant indirect effects were found at average (*B* [SE] = .56 [.23], 95% CI [.17, 1.07], *z* = 2.41, *p* = .016) and high levels of heavy episodic drinking (*B* [SE] = 1.39 [.44], 95% CI [.66, 2.37], *z* = 3.15, *p* = .002).

Discussion

While there is a significant alcohol-related health disparity for AI/ANs, causal explanations for the problem behaviors of a people that focus on dispositional factors such as biology and genetics is a hallmark of prejudice (Steele & Aronson, 1995). Despite significant scientific efforts to find genetic or other biological explanations for alcohol-related health disparities affecting AI/AN peoples, the notion of an AI/AN specific biological vulnerability to alcohol problems is without scientific merit based on current evidence (Ehlers & Gizer, 2013; Enoch & Albaugh, 2017). However, it has been shown that internalizing stereotypes and negative beliefs about one's group can have negative consequences in regard to achievement and health (David & Derthick, 2014). The findings of this study provide further evidence of the harmful effects of internalized stereotypes and stereotype threat. In this study, we found that greater belief in a BV was indirectly associated with greater alcohol consequences through its effect on greater depression and in turn greater drinking to cope. However, the association of this indirect effect and the association of belief in a BV with depression was only found among

individuals who were average or higher in heavy episodic drinking and was not found for individuals who were low in heavy episodic drinking. It is notable that the strength of the association between belief in a BV and depression increased by 2.5 times as episodes of heavy episodic drinking moved from average to high levels. At average levels of binge drinking, a one-point increase in belief in a BV was associated with a 2-point increase in depression ratings, while at high levels it was associated with a 5-point increase in depression ratings.

Consistent with a previous study with Alaska Native college students, in this sample we found that drinking to cope with negative affect was associated with greater alcohol consequences (Skewes & Blume, 2015). While previous research with general samples have found an indirect association of depression and alcohol consequences through drinking to cope with negative affect (e.g., Gaher et al., 2006; Gonzalez et al., 2009, 2011), this is the first study to examine and find evidence of this indirect effect in an AI/AN sample. In addition to the moderated indirect effect of belief in a BV to drinking to cope through depression, we also found that belief in a BV was directly associated with greater drinking to cope. These multiple pathways from belief in a BV to drinking to cope are concerning given the strong association of drinking to cope with current alcohol consequences found in this study, as well as prospective research findings that show that drinking to cope is associated with increased alcohol consequences over time among college students (Merrill, Wardell, & Read, 2014; Le & Iwamoto, 2019).

In the current study, greater belief in a BV was conceptualized as a form of an internalized stereotype that could also trigger stereotype threat and was associated sequentially with greater depression, drinking to cope, and alcohol consequences among individuals average to high in heavy episodic drinking. Little research has been conducted examining the effects of

stereotypes or discrimination with drinking to cope and alcohol consequences in AI/ANs. Previous research with AI youths has found that greater perceived discrimination and racial microaggressions were associated with greater alcohol consequences (Dickerson et al., 2019). Likewise, Davis et al. (2019) found in an AI adolescent sample that being higher in drinking to cope motives and enhancement motives (e.g., "To feel good or get high") was associated with greater perceived discrimination and greater heavy drinking. Similar associations to those found in the current study for belief in a BV have been found for discrimination in other minority populations. Lewis et al. (2016) found an indirect association between sexual orientation discrimination and problematic drinking through the following sequential mediators: proximal minority stress → rumination → distress → drinking to cope. Le and Iwamoto (2019) found that among Asian American college students, discrimination was indirectly associated with greater alcohol consequences through drinking to cope, as well as having direct effects on drinking to cope. Thus, the findings of this study are generally consistent with those of previous research on the effects of discrimination on alcohol consequences through distress and drinking to cope, and extends this research to the effects of an alcohol-related stereotype on alcohol consequences among AI/ANs who drink.

The findings of this study are consistent with both stereotype threat and the drinking restraint model. Stereotype threat is triggered when individuals find themselves confronted with a scenario that is specific to the domain of the stereotype content (Steele & Aronson, 1995)—in this case, drinking contexts. Simply being confronted with such scenarios can be enough to trigger stereotype threat, which could result in negative affect and impaired performance in the stereotype-related context (Schmader et al., 2008; Spencer et al., 2016; Steele, 1997; Steele & Aronson, 1995). Perceiving oneself to be behaving consistently with a stereotype may compound

negative affect, which in turn may further impair performance on the stereotype-related task (Steele, 1997; Steele & Aronson, 1995). Thus, stereotype threat may also help to explain the positive association between belief in a BV and alcohol consequences found previously in this sample of students (Gonzalez & Skewes, 2016).

These results may also be explained from the perspective of the drinking restraint model. The drinking restraint model does not account for stereotypes, but does suggest that efforts to restrain drinking can have paradoxical effects because of the limit violation effect (Collins, Lapp, & Izzo, 1994; Muraven et al., 2005a). That is, when drinkers are preoccupied with adhering to a self-imposed limit for alcohol consumption and then exceed that limit, the resulting guilt and shame can trigger additional drinking as a means of coping with the unpleasant feelings. From this perspective, belief in a BV may elicit concern with the need to restrain drinking to (a) avoid confirming stereotypes about AI/ANs and alcohol, and/or (b) out of fear that drinking may result in developing problems with alcohol. Failing to restrain drinking (i.e., by drinking heavily) among individuals who are preoccupied with doing so can trigger negative affect and then lead to increased subsequent drinking, presumably to cope with that negative affect (Muraven et al., 2005a), which is consistent with our findings.

Consideration of stereotype threat and the drinking restraint model provides a complimentary explanation for how belief in a BV may produce negative affect and drinking to cope among AI/AN college students. Attempts to suppress activated stereotypes is an effortful activity that depletes working memory (see Spencer et al., 2016 for a review). As it relates specifically to stereotyped peoples, the psychological and affective strain brought on by stigma awareness, like stereotype threat, has been shown to impede self-control (Inzlicht et al., 2006). When individuals are expending self-regulatory energy resources to suppress activated

stereotypes and simultaneously attempting to adhere to a previously set drinking limit, both may negatively affect ability to control alcohol use or to regulate negative affect through more adaptive means than drinking to cope, thus leading to greater alcohol consequences.

There are several limitations that should be considered when interpreting the results of this study. First, the design was cross-sectional and therefore we could not establish a causal relationship. Future prospective research is needed to understand the directional association between belief in a BV and drinking to cope. Another limitation is that our sample of AI/ANs were all college students from Alaska. It should not be assumed that these findings would generalize to AI/AN people who are not college students or who are from other regions of the country. It is important to consider that there is a great deal of diversity across AI/AN tribes with regard to history, cultural traditions, as well as alcohol-related problems that may affect beliefs, attitudes, and reactions to this stereotype. Another potential limitation was the age range in this sample, which was higher than the typical mean age for a U.S. college student sample, although it was representative of the average age for AI/AN college students at the institutions where the study was conducted. Finally, women were overrepresented in our sample (69.9%); however, it should be noted that AI/AN women (64%) outnumber men (36%) at the institutions where the study was conducted.

Given the growing literature on the link between believing in a BV and negative alcohol outcomes for AI/ANs who drink (Gonzalez & Skewes, 2016, 2018; Gonzalez et al., 2019), future research is needed to develop effective ways of debunking the BV myth. This might be particularly challenging due to the widespread endorsement of the BV myth among both AI/ANs and non-Native people. Future interventions might involve psychoeducation to debunk the notion of a BV and provide alternative explanations for alcohol-related health disparities among AI/AN

peoples (e.g., increased prevalence of stressors such as racism and discrimination, historical and contemporary trauma, and inequities in the social determinants of health). Debunking the BV myth may help to disrupt its impact on affective states and subsequent drinking to cope, leading to improved alcohol outcomes for AI/ANs. It also may help to alter the societal narrative surrounding AI/ANs and alcohol, thereby reducing prevalence of this harmful stereotype among AI/ANs and non-Natives alike.

Conclusion

In conclusion, these results provide evidence for the negative and powerful impact of harmful stereotypes on targeted groups. The BV myth narrative, although widely accepted, has not translated into public health benefits for AI/AN people or communities. In this study we found support for the link between negative affect, drinking to cope with negative affect, and greater alcohol consequences. Our findings suggest that belief in the BV myth may act as a type of stereotype threat, contributing to negative affect, drinking to cope, and alcohol consequences for those who drink more heavily. The findings of this study also are consistent with previous research on the limit violation effect posited by the drinking restraint model, with violations in self-imposed drinking limits being associated with increased negative affect and drinking to cope. Taken together with the extant literature on the BV myth among AI/ANs, these findings indicate a pressing need to debunk this harmful myth alongside other efforts to decrease alcohol-related health disparities among AI/ANs.

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Table 1

Means, Standard Deviations, and Intercorrelations of Study Variables (*N* = 156)

Variables	*M*	*SD*	1	2	3	4	5	6
1. Belief in BV	3.99	1.08	—					
2. Depression	12.06	10.12	.24**	—				
3. Drinking to Cope	1.94	.88	.26**	.50***	—			
4. Alcohol Consequences	16.47	12.42	.27***	.40***	.59***	—		
5. Heavy Episodic Drinking[a]	4.32	5.94	.18*	.32***	.48***	.66***	—	
6. Age	27.09	9.18	.09	-.04	-.17*	-.15	-.17*	—
7. Gender[b]			-.003	.10	.001	-.07	-.07	-.01

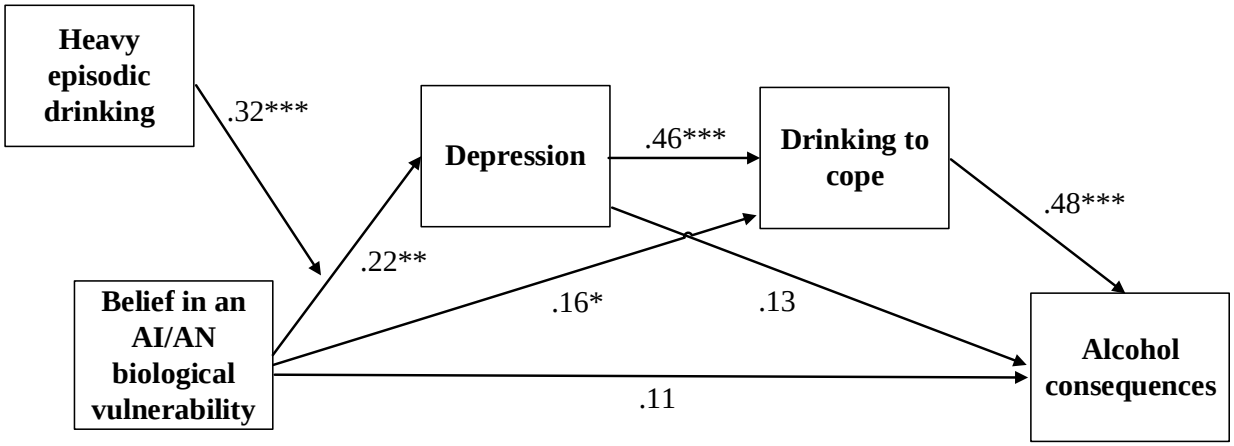
[a] Correlations were calculated using the square-root transformed variable, while the mean and standard deviation shown represent the untransformed variable.

[b] Gender was coded such that men = 0 and women = 1. Thus, positive coefficients would suggest women scored greater than men on a given construct; however, no significant gender differences were found.

*$p < .05$. **$p < .01$. ***$p < .001$.

Figure 1

Moderated-Mediation Model of the Association of Belief in an AI/AN Specific Biological Vulnerability with Alcohol Consequences



Note. Depicted above are the standardized regression coefficients for each path of the model. Gender and age were included as covariates. *$p < .05$. **$p < .01$. ***$p < .001$.

Figure 2

Relationship of Belief in an AI/AN Biological Vulnerability to Alcohol Problems with Depression as Moderated by Frequency of Heavy Episodic Drinking (HED)