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Self-Stigma And Problematic Alcohol Use: Risk Factor, Protective Factor, Or Both?

Victoria Olegovna Chentsova

College of William and Mary - Arts & Sciences, victoria.chentsova@gmail.comFollow this and additional works at: <https://scholarworks.wm.edu/etd>Part of the [Experimental Analysis of Behavior Commons](#)

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Self-Stigma and Problematic Alcohol Use: Risk factor, Protective Factor, or
Both?

Victoria O. Chentsova

Saipan, CNMI

Bachelor of Arts, Williams College, 2019

A Thesis presented to the Graduate Faculty of College of William & Mary in
Candidacy for the Degree of
Master of Science

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APPROVAL PAGE

This Thesis is submitted in partial fulfillment of
the requirements for the degree of

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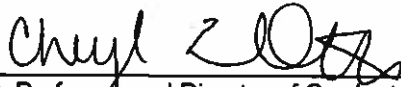
Victoria O. Chentsova

Approved by the Committee April 2023



Committee Chair

Adrian J. Bravo, Assistant Professor, Psychological Sciences
College of William & Mary



Cheryl L. Dickter, Professor and Director of Graduate Studies, Psychological Sciences
College of William & Mary



Joshua A. Burk, Professor, Psychological Sciences
College of William & Mary

COMPLIANCE PAGE

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ABSTRACT

Background. While research has examined the effect of stigma from others towards individuals with alcohol use disorders (AUD), few studies have examined the relationship between perceived self-stigma related to AUD and corresponding engagement with alcohol among non-clinical samples. *Present Study.* The present studies examined the relationships between perceptions of self-stigma of AUD, proximity to others with AUD, and alcohol use behaviors and outcomes. *Methods.* In Study 1, participants ($n = 3,169$; 73.9% female) were college students within the U.S. recruited to participate in an online survey on substance use including questions on AUD self-stigma, alcohol use behaviors and negative alcohol use consequences. Study 2 replicated the study design and sample demographics ($n = 299$; 68.3% female), with the addition of an assessment of AUD symptoms. *Results.* Results for Study 1 indicated significant differences in stigma scores such that individuals who have engaged in alcohol use reported higher AUD self-stigma scores than individuals that never engaged with alcohol or engaged in the last 30-days. Across both studies, higher self-stigma scores significantly related to less alcohol use, less negative alcohol use consequences, and fewer AUD symptoms. Results also revealed that for people who endorse proximity to AUD, self-stigma scores and alcohol use engagement and consequences were significantly higher than in individuals with no endorsed proximity. *Conclusions.* We interpret these findings not to say that self-stigma is a positive clinical intervention, rather increased awareness of the consequences of AUD has a negative relationship with alcohol use among young adults and warrants further investigation.

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Self-Stigma and Problematic Alcohol Use: Risk factor, Protective Behavioral Tool, or Both?

Alcohol is the most widely used drug across the U.S. population, with over 133 million people above the age of 12 endorsing using alcohol in the last month alone (Substance Abuse and Mental Health Services Administration, 2022). Clinically, alcohol use disorder (AUD) affects approximately 9.0% (29.5 million) of the U.S. population (Substance Abuse and Mental Health Services Administration, 2022). Across differing age groups, young adults between ages of 18 and 25 are at most risk for developing AUD, with nearly 15.0% (5.0 million) having met criteria for an AUD diagnosis in the last year (Substance Abuse and Mental Health Services Administration, 2022). There are many factors that can influence the progression to problematic alcohol use or AUD, including individual (e.g., genetics, personality), family and home environment, public policy, community, and cultural tendencies (Grigsby et al., 2016; Sudhinaraset et al., 2016). Despite the rich selection of research into risk and protective factors associated with the development of problematic alcohol use, AUD still develops among many young adults annually. Moreover and despite the knowledge of the dangerous effects of problematic alcohol use and AUD, both to the affected individual (Boden et al., 2013; Silveri, 2012; Volpicelli & Menzies, 2022; White & Hingson, 2014) and to those around the individual (Anderson et al., 2009; Boden et al., 2013; Greenfield et al., 2009), roughly only one in four people receive treatment for AUD globally (Mekonen et al., 2021). Within the U.S. rates of

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treatment are low, with less than one in ten receiving treatment (Substance Abuse and Mental Health Services Administration, 2022). Public health and research efforts have continued to work to increase efficacy and access to treatment, addressing biological, socio-cultural, and practical barriers to care. Among socio-cultural barriers, stigma has garnered extensive research, although limited among young adult non-clinical populations.

Stigma

Today, public health officials and clinicians alike are increasing efforts towards de-stigmatization of AUD. This is unsurprising as it is well-established in the literature that stigma leads to social segregation and exclusion (Committee on the Science of Changing Behavioral Health Social Norms et al., 2016; Corrigan & Shapiro, 2010). Further, stigma is an identified barrier in recovery for people with AUDs (Kilian et al., 2021). However, conflating stigma into one category does not do the concept justice, as stigma has many different facets. It is important to recognize these different facets as they each have unique relationships with problematic alcohol use and AUD.

Public Stigma. Public stigma, often also referred to as social stigma, is best understood as prejudice widely endorsed by communities and perpetuated by social norms in attitudes that affects a particular identity (Corrigan et al., 2005; Pearson, 2015). Public stigma can be further broken down into perceived public stigma, or the extent that individuals of a stigmatized identity believe others endorse beliefs, and actual public stigma, or the extent that individuals endorse

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prejudiced beliefs (Pearson, 2015). Though public stigma exists around a plethora of conditions, public stigma around problematic alcohol use and AUD has historically appeared more negative and with higher consequences than other psychopathologies, with people often being characterized as to blame for their condition (Glass et al., 2013; Schomerus, Lucht, et al., 2011). Public stigma of problematic alcohol use and AUD in young adults most often manifests in negative perceptions of the individual engaging in problematic alcohol use or with AUD, often characterizing them as dangerous and unpredictable, and encouraging maintaining social distance and structural discrimination (Committee on the Science of Changing Behavioral Health Social Norms et al., 2016; Schomerus, Lucht, et al., 2011; Tu et al., 2019).

Public stigma towards individuals engaging in problematic alcohol use and AUD has been associated with a slew of negative outcomes. Public stigma is often understood as a barrier to treatment for problematic use and substance use disorders broadly, where individuals are less likely to seek help for the condition of their substance use (Gutierrez et al., 2020; Kelley, 2010). For those who do reach help, they are often seen to have slower recovery periods (Brewer, 2006; Buchanan & Young, 2000) and higher rates of treatment drop-out (Brenner et al., 2010) when faced with public stigma. Ultimately, outside of treatment, individuals engaging in problematic alcohol use or AUD show worse mental and physical health outcomes (Ahern et al., 2007; Frischknecht et al., 2011; Link et al., 1987), experience increased shame (Livingston et al., 2012) and feelings of being

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unwanted by society (Rivera et al., 2014), and ultimately experience social exclusion that contributes to restricted opportunities (Corrigan & Shapiro, 2010; Pescosolido et al., 2007).

Self-stigma. Self-stigma, on the other hand, is best understood as the negative feelings, including shame and fear of experiencing enacted stigma in the form of prejudice that comes from an individual's identification with a particular stigmatized identity (Pearson, 2015; Luoma et al., 2013). Self-stigma is understood to generally develop because of a combination of four stages (Schomerus, Corrigan, et al., 2011): stereotype awareness (i.e. being aware of negative stereotypes endorsed by the general public), stereotype agreement (i.e. buy-in to these stereotypes as holding some semblance of validity), stereotype concurrence (i.e. seeing the stereotype as applicable to oneself), and stereotype harm (i.e. experiencing a blow to self-esteem due to the application of the stereotype on oneself). All of these stages have their own unique psychometric properties contributing to specific outcomes, such as personal discriminatory attitudes towards people with AUD at the level of stereotype awareness (Schomerus, Corrigan, et al., 2011). Given these stages, it is no surprise that self-stigma is often closely associated with public stigma, where public stigma provides stereotype awareness and reinforces stereotype agreement (Schomerus, Corrigan, et al., 2011). Further, public stigma need not always exist, the mere perception of stigma, that is an expectation of stigmatization from the public on an individual, can also lead to heightened levels of self-stigma

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(Corrigan & Rao, 2012; Fortney et al., 2004; Hammarlund et al., 2018; Vally et al., 2018).

Though associated with public stigma, it is hard to consistently predict self-stigma outcomes as they are influenced not only by environmental factors but also by a cocktail of individual demographic and behavioral factors. As a result, the literature on self-stigma has not been quite as straight forward as research on public stigma. Some research has demonstrated its effects as similar to that of public stigma where increased self-stigma has been associated with poorer mental health outcomes (Ahern et al., 2007), reduction in quality of life, poorer academic achievement, and poorer social interaction (Jones & Corrigan, 2014). More specific to alcohol use behaviors, increased self-stigma, similar to public stigma, has been associated with decreased help seeking in clinical populations (Gutierrez et al., 2020) as a result of a desire to take on their problematic alcohol use or AUD alone (Allen & Mowbray, 2016; Cohen et al., 2007; Grant, 1997), treatment access barriers (Ali et al., 2017), and being scared to seek help (Cares et al., 2015; Pal et al., 2003).

However, other research has contradicted the association between self-stigma and poorer outcomes in peoples engaging in problematic alcohol use or with AUD. One study found that self-stigma is not necessarily associated with severity of alcohol use problems or AUD, but people engaging in problematic alcohol use or with AUD tend to demonstrate higher levels of self-stigma, naturally, as the stigmatized identity applies more closely to them as they can

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report based on lived experiences (Brown et al., 2015). Another study found that increased levels of self-stigma for individuals in treatment for problematic alcohol use or AUD was associated with fewer legal problems (Luoma et al., 2007). Further, research has demonstrated that self-stigma can predict residential treatment length, such that higher-self stigma is associated with increased voluntary stay, though that often comes with higher treatment cost (Luoma et al., 2014). Overall, pinning down a single effect of self-stigma is challenging with contradictory findings across the board (Kulesza et al., 2013) and some research suggesting that many of the negative effects of self-stigma on outcomes in individuals engaging in problematic alcohol use or with AUD is a result of indirect effects via negative emotions and other cognitive mechanisms (Crapanzano et al., 2019).

Perceived Self-stigma. Within stigma research generally and the self-stigma research specifically, studies thus far have primarily focused on the effects of stigma against individuals that identify with the stigmatized identity (i.e., people with AUD). Limited research has examined how self-stigma can influence alcohol use behaviors among individuals engaging in alcohol use at a pre-problematic level or without an AUD diagnosis. There is reason to believe that such expectations or perceptions of the stigma one *would* experience if they *did* engage in problematic alcohol use or if they were diagnosed with AUD (hereon referred to as *perceived self-stigma*), could be different from the outward expressions of stigma. The theory of planned behavior, for instance, posits that

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behavior, such as alcohol consumption behaviors, is influenced by intention behind and use for that particular behavior (Ajzen, 1991). Further, those intentions are shaped by attitudes, subjective norms, and perceived control over behavior (Ajzen, 1991). Based on this theory, it can be inferred then that the negative attitudes and subjective norms towards people with AUD and the notion of control over alcohol consumption behaviors may contribute to a desire to monitor behavior around alcohol use more closely. As a result, it may be that in populations engaging in alcohol use at pre-clinical levels, higher reports of perceived self-stigma for problematic alcohol use or AUD may be associated with fewer problematic alcohol use behaviors.

Thus far, little research has tested this research question. The research that has explored such ideas seems to fall in line with theory of planned behavior expectations. In particular, one study demonstrated that among young adult college students who have consumed alcohol in their life, those who consumed alcohol recently (last 30 days) reported significantly lower levels of self-stigma than those who had not consumed alcohol recently and, further, perceived self-stigma for SUDs broadly were negatively related to problematic alcohol use indicators and AUD scores (Chentsova et al., 2023). However, this line of research needs more replication. Beyond replication, the inconclusive evidence in associating self-stigma with AUD development has brought researchers to another critical question: What could influence the relationships between self-stigma and alcohol use behaviors? While many factors could potentially influence

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this relationship; we focus on personal experiences in witnessing or having an AUD (i.e., proximity to AUD) as a potential moderator.

Proximity to AUD

For the purposes of this research, proximity can be best understood as an individual's personal experience with other individuals (e.g., a partner, a parent, a friend, a distant relative) either engaging in problematic alcohol use or with an AUD. A variety of studies have attempted to establish links between proximity and one's own behaviors using alcohol and attitudes towards alcohol.

In regard to one's own alcohol use behaviors, there is some research linking individuals at risk of developing an AUD with individuals with a diagnosed AUD via genetic links (Deak et al., 2019). Research going beyond genetic factors that focus on neural development and functioning have found relationships between having a family member with a diagnosed AUD and brain development of individuals, specifically in hippocampal development (Hanson et al., 2010), amygdalar volume (Hill et al., 2001), and cerebellar volume (Hill et al., 2007). It should, however, be noted that attribution of alcohol use behaviors strictly to genetic expression has been contradicted with findings of weak association (Baer et al., 1998; Stice et al., 1998) and inherited patterns of neural development only accounts for a small predetermined portion of risk for developing AUD, with much of these research being contradicted with null findings (Alterman et al., 1989; Silveri, 2012; Silveri et al., 2008; Vitaro et al., 1996). Recent research rather attributes much of the seemingly inherited effects to a phenotypic combination of

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genetic predisposition and environmental risk for problematic alcohol use and AUD (Coley et al., 2017), which aligns with the diathesis-stress model (Windle, 2010; Zuckerman, 1999).

These socio-behavioral factors contributing to the phenotypic expression and changes observed in neural structure have also received some attention in context of proximity for their direct and total associations with behavioral risk for problematic alcohol use and AUD, though the studies have been inconclusive of whether proximity is a risk factor or a protective factor. One study, for instance, examined general drinking behaviors of family members and friends of non-clinical drinking populations and found that the drinking behaviors of any individual was significantly related most strongly to their non-biological family (i.e. spouses), followed by friends, and then siblings, presumably as a result of the overlapping social norms they operate in (Rosenquist et al., 2010). Another study demonstrated that in families with an individual affected by a substance use disorder, family members, particularly children, tend to experience increased negative emotional and behavioral patterns, including increased risk of development of substance use disorder themselves (Lander et al., 2013). On the other hand, another study found that in youth with alcohol problems they were no more likely to have a family history of problematic alcohol use or AUD than those with no alcohol problems (Barnow et al., 2002). Some research, in fact, have even found some positive influence of family history of problematic alcohol use or AUD in individuals who related to persons in 12-step recovery programs,

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specifically increased understanding of AUD, emotional development, and development of healthy boundaries that all serve as protective mechanisms against problematic alcohol use and AUD (Jackson, 2017) .

Beyond the influence on people's own alcohol use behaviors, proximity has also been explored in its direct associations with attitudes towards alcohol (Meulewaeter et al., 2022; Schomerus et al., 2014). Though the research is limited, some studies have demonstrated that proximity to an individual engaging in problematic alcohol use or AUD, more specifically, having an immediate family member or close friend with a problematic alcohol history was predictive of lower levels of stigma towards others with AUD (Tu et al., 2019). Other studies have shown that having a parent in recovery from problematic alcohol use or AUD can lead to more positive attitudes towards others engaging in problematic alcohol use or with AUD and chances of recovery (Callan & Jackson, 1986). Further, research has established that the reduction of negative attitudes in families affected by problematic alcohol use or AUD contributes to sustained recovery and healthier outcomes for all members, which in turn reduces burden on family members (Burk & Sher, 1990; Corrigan & Miller, 2004) .

Despite this coverage, the literature focused on the effects of familiarity with someone engaging in problematic alcohol use or AUD and an individual's own alcohol use behaviors is very limited. Further, it is still not entirely clear how proximity with non-family members influences one's own alcohol attitudes (e.g., perceived self-stigma) and if that plays a role in determining the outcomes of

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one's own alcohol consumption behaviors. Much of the existing research is concerned with proximity to the extent that the individual under question shares close environment with the person engaging in problematic alcohol use or AUD and how that environment equally influences the individual, rather than factors of distant relationships and overall attitudes.

Present Study

The purpose of the present research is to investigate the relationships between perceived self-stigma, proximity, and alcohol use behaviors. More specifically, this study aims to expand on existing research to clarify the relationship between perceived self-stigma and alcohol use behaviors by examining other factors that may hold associations with either perceived self-stigma and/or alcohol use behaviors in high-risk drinking populations that do not necessarily meet AUD criteria (Volpicelli & Menzies, 2022). The present research will address these questions through two independent studies. The first expands on the findings from a larger multi-site study (Chentsova et al., 2023), and will assess associations between perceived self-stigma of AUD, proximity to problematic alcohol use and AUD, and alcohol use behaviors including negative alcohol-related consequences. The second study will replicate this in a smaller sample and additionally explore explicit measures of AUD symptoms. Ultimately, the findings of this study are intended to introduce a unique profile of self-stigma outcomes for non-clinical populations and establish foundational work to better understand what specific factors within self-stigma serves as a potentially

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protective factor that can be bolstered in preventative programming. It is important to note that the focus of this research is on individuals not diagnosed with AUD, as limited research has explored alcohol use perceptions and behaviors from this perspective. Thus, this research should, by no means should the research be taken out of context as stigma, historically, has been weaponized against individuals engaging in clinical levels of problematic alcohol use and with AUD.

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Study One

The primary aim of Study One was to expand on previous studies in examining mean differences in perceptions of self-stigma between college students of different alcohol use backgrounds and examine the relationships between alcohol use behaviors and perceived self-stigma. In line with the work of Chentsova and colleagues (2023) we hypothesized that significant differences in the perceived self-stigma scores would arise across people with different alcohol use backgrounds such that individuals who used alcohol in the last 30 days (Last 30 Day Use) would report significantly lower perceived self-stigma scores as compared to individuals who have never used alcohol (No Lifetime Use) or used alcohol but not actively in the last 30 days (Lifetime Use). Further, in line with the theory of planned behavior (Ajzen, 1991) we hypothesized that those with higher perceived self-stigma scores, would report lower frequency, quantity, and consequences related to alcohol use (i.e., negative correlations). Moreover, we expand from the previous study by additionally examining the relationships between lifetime proximity and alcohol use behavior as well as the role of lifetime proximity to AUD as a moderator in the relationship between perceived self-stigma and alcohol use behaviors. Given the mixed literature on the relationships between proximity and alcohol use outcomes and stigma and alcohol use outcomes, these analyses were primarily exploratory in trying to understand if and how proximity moderates the relationship between perceived self-stigma and alcohol use behaviors.

Method

Participants and Procedure

Participants were U.S. based college students that participated in an hour-long online survey (standardized across sites) exploring substance use and other health outcomes. Participants were recruited from Psychology Department Participant Pools (i.e., SONA) at five universities in the U.S. (Colorado State University, University of Wyoming, College of William & Mary, Texas State University, George Washington University) and from the general psychology student population (i.e., all students enrolled in psychology courses at the time of sampling) at one higher education site (Trinity College) during the Fall of 2022. Participants were provided either research participation credit, extra credit, or entry to a raffle, depending on the institution and participant preference. This study used a single-site IRB and the University of Wyoming IRB approved all procedures.

The analytic sample for this study was limited to students in the 18 to 25 age range who reported no official diagnosis of AUD ($n = 3,169$). Among our analytic sample, the majority indicated that they identified as female ($n = 2,261$, 73.9%) and white, non-Hispanic ($n = 1,779$, 56.2%). Further 18.0% of individual reported never having consumed alcohol ($n = 570$), 13.9% reported having consumed alcohol in their lifetime but not in the past 30 days ($n = 440$), and 68.1% reported having consumed alcohol within the last 30 days ($n = 2,159$).

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Participants who signed up for the study via SONA were immediately redirected to a Qualtrics website hosting the survey. At Trinity College, participants accessed the Qualtrics survey through a link that was provided to them via email. Before completing the survey, participants read the informed consent and agreed to participate. From there participants completed a series of demographic questions, followed by a variety of questionnaires assessing their substance use and other health behaviors. The total survey took approximately 60 minutes to complete. Upon completion, SONA participants were granted instance credit, while at Trinity participants were redirected to a supplementary survey where they provided necessary details to grant them course credit or enter them into a raffle.

Measures

Alcohol Use. Single items were used to measure lifetime alcohol use, past 30-day alcohol use frequency, and past 30-day binge drinking frequency (i.e., drinking 4+/5+ standard drinks in 2 hours or less, for women/men). Alcohol use backgrounds were constructed categorizing people by endorsement of no lifetime alcohol use ("*No Lifetime Use*"), lifetime alcohol use without past 30-day use ("*Lifetime Use*"), or lifetime alcohol use with past 30-day use ("*Last 30-Day Use*"). To measure typical quantity of alcohol use per week, participants were presented with a visual guide about typical drinks to help them ascertain the concept of Standard Drink Units (SDUs). Using a grid such that each day of the week was broken down into six 4-hour blocks of time (12a-4a, 4a-8a, 8a-12p,

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etc.), participants were asked to report at which times they consumed alcohol during a “typical week” in the past 30 days, as well as the number of drinks typically consumed during that time block. Typical quantity of alcohol use was calculated by summing the total number of standard drinks consumed across time blocks during the typical week (quantity estimates >3SDs above the mean were Winsorized to the 3SD value).

Alcohol Use Consequences. Negative alcohol-related problems were assessed using the Brief-Young Adult Alcohol Consequences Questionnaire (B-YAACQ; Kahler et al., 2005). The B-YAACQ is a 24-item questionnaire, adapted from the 48 Item Young Adult Alcohol Consequences Questionnaire (Read et al., 2006) that measures alcohol-related negative experiences within the past 30 days (e.g., “*I have often found it difficult to limit how much I drink*”, “*When drinking, I have done impulsive things that I regretted later*”). Prior research has established psychometric validity of both the original YAACQ and the B-YAACQ in U.S. college students, demonstrating associations with alcohol use disorder symptoms and, though weakly, with short-term future drinking practices (Kahler et al., 2008; Merrill et al., 2021; Read et al., 2007). Participants were instructed to respond to statements regarding alcohol use consequences with “Yes” for the items they endorsed in the last 30-days and “No” for items they did not endorse in the last 30-days. A composite score reflective of the total number of distinct alcohol problems experienced in the past 30 days was created by summing all endorsed experiences.

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Proximity to Problematic Alcohol Use and AUD. Proximity to AUD was assessed using an original questionnaire. Participants were presented a list of 11 possible people such as “biological parent” or “romantic partner”, as well as an “Other, please specify: _____” option) and asked to indicate if they know any individuals on the list who previously were or currently are “*diagnosed with and alcohol use disorder*”. For each endorsed individual, participants were branched to supplemental questions regarding the frequency of interaction with that individual (with six levels of response: “*No contact with this individual*”, “*Less than Yearly*”, “*Less than Monthly*”, “*Monthly*”, “*Weekly*”, “*Daily or Nearly Daily*”), and if the individual is in recovery (with three levels of response: “*Yes, Abstinence*”, “*Yes, moderate use/non-problematic use*”, “*No*”). For the purposes of this study, scores were collapsed into a “Yes” and “No” category, where participants who endorsed knowing any individual outside of themselves with a diagnosed AUD were scored with “1”, while participants who endorsed knowing no one with a diagnosed AUD were scored with “0”.

Self-Stigma of Alcohol Use Disorder. Self-stigma of AUD was assessed by modifying the a prior adaptation (Chentsova et al., 2023) of the Self-Stigma of Mental Illness Scale (SSOMI; Tucker et al., 2013). In their study, Chentsova and colleagues adapted the SSOMI, replacing the term “mental illness” with “substance use disorder” throughout the measure. As the present study was primarily focused on alcohol use, the measure was further modified to replace “substance use disorder” with “alcohol use disorder (AUD)”. Participants were

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presented with a set of ten statements (e.g. “*I would feel inadequate if I had an alcohol use disorder*”, “*It would make me feel inferior to have an alcohol use disorder*”) regarding the degree to which they believed that their self-image would diminish if they were to have an AUD. Participants were instructed to use a five-point scale ranging from 1 (“*strongly disagree*”) to 5 (“*strongly agree*”). Per previous research examining the measure with respect to substance use disorders, scores were broken down across two subscales, perceptions of negative self-esteem (NSE) and perceptions of negative self-efficacy (NSEF). To confirm the two-factor structure established in previous literature on “Substance Use Disorder” (Chentsova et al., 2023) for “Alcohol Use Disorder”, we conducted a confirmatory factor analyses (CFA) in our analytic sample with maximum likelihood estimation using *Mplus* 8.7 (Muthén & Muthén, 1998-2023). To evaluate overall model fit, we used model fit criteria suggested (Marsh et al., 2004) including the Comparative Fit Index (CFI) > .90 (acceptable) > .95 (optimal), Tucker-Lewis Index (TLI) > .90 (acceptable) > .95 (optimal), Root Mean Square Error of Approximation (RMSEA) < .06, and Standardized Root Mean Square Residual (SRMR) < .08. The CFA demonstrated an optimal fit for the two-factor model ($\chi^2(34) = 548.865$, $p < .001$], CFI = .959, TLI = .946; RMSEA = .069 [90%CIs = 0.064, 0.074], SRMR = .037). The factor loadings of the final two factor solution were all salient (>.30) and significant at $p < .01$.

Analyses Plan

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All the analyses described were conducted using IBM SPSS Statistics (Version 27). To assess study aims around perceived-self stigma and alcohol use behaviors, we first conducted a series of one-way Analyses of Variances (ANOVAs) to identify significant differences in each of the two facets of perceived self-stigma scores (Self-Esteem, Self-Efficacy) between distinct alcohol use backgrounds (No Lifetime Use, Lifetime Use, Last 30-Day Use). The ANOVA was followed by post-hoc Bonferroni test to identify the specific pair-wise differences. To investigate independent associations between heightened perceived self-stigma scores on each of the two facets of self-stigma (Self-Esteem, Self-Efficacy) and each of the alcohol use behavior variables (Alcohol Use Frequency, Alcohol Typical Quantity, Alcohol Last 30 Binge Day, Alcohol Use Consequences) bivariate correlations were examined across the total sample.

To assess study aims around proximity, we first conducted a series of T-Tests to identify significant differences in alcohol use behavior variables (Alcohol Use Frequency, Alcohol Binge Frequency, Alcohol Typical Quantity, Alcohol Use Consequences) as well as self-stigma variables (Self-Esteem, Self-Efficacy) across individuals who endorsed lifetime proximity to AUD and individuals who did not endorse lifetime proximity to AUD.

Finally, multiple simple moderation analyses were conducted using the PROCESS 4.1 macro for SPSS (Hayes, 2017). We conducted a total of four moderation analysis (Model 1 in PROCESS) to test whether the relationship

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between self-stigma scores and drinking outcomes including Alcohol Use Frequency, Alcohol Binge Frequency, Alcohol Typical Quantity, Alcohol Use Consequences, vary depending on whether an individual knows someone with a diagnosed AUD or not. Variables were standardized to produce standardized regression coefficients. Gender and age were controlled for in each of the moderation analyses. Given our large sample size and power, significance was determined at a $p < 0.01$ cut off for the perceived self-stigma ANOVA and corresponding post-hoc Bonferroni tests. Statistical significance for correlations between perceived self-stigma and alcohol use behaviors and lifetime proximity to AUD T-Tests were determined using 99% confidence interval that do not contain zero. For the moderation analyses, statistical significance was also determined by 99% bootstrapped confidence intervals (based on 10,000 bootstrapped samples) that do not contain zero, and interactions were probed at low (1 SD below the mean), medium (average levels), and high levels (1 SD above the mean) of the moderator (i.e., proximity to AUD).

Study One Results

Perceptions of AUD Self-Stigma Across Alcohol Use Backgrounds

Descriptive statistics of all study variables and reliability statistics for relevant measures are presented in Table 1. In examining differences on self-stigma between different alcohol use backgrounds ($n = 3,162$), the ANOVA revealed no significant differences on NSE scores of people with different alcohol use backgrounds: No Lifetime Use ($M = 20.79$, $SD = 3.66$), Lifetime Use ($M =$

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21.33, $SD = 3.55$), and Last 30-Day Use ($M = 20.91$, $SD = 3.79$), $F(2, 3159) = 2.91$, $p = .05$, $\eta^2 = .002$. However, we did find significant differences on NSEF scores of people with different alcohol use backgrounds, $F(2, 3159) = 9.04$, $p < .001$, $\eta^2 = .006$). Post-hoc Bonferroni corrected tests revealed that people in the Lifetime Use group ($M = 20.47$, $SD = 3.98$) reported significantly higher NSEF scores than both the No Lifetime Use ($M = 19.34$, $SD = 4.63$) and the Last 30 Day Use ($M = 19.63$, $SD = 4.37$) group.

Correlations with Alcohol Use Behaviors and Outcomes

Bivariate correlations among study variables are reported in Table 1. At the bivariate level, NSE was significantly positively associated with NSEF ($r = .41$). Looking at alcohol use behaviors, NSE was significantly negatively correlated with weekly alcohol quantity consumed ($r = -.14$), weekly frequency of drinking ($r = -.12$), 30-day frequency of binge ($r = -.09$), and B-YAACQ scores ($r = -.09$). NSEF was only negatively correlated with weekly alcohol quantity consumed ($r = -.10$) and weekly frequency of drinking ($r = -.12$). Taken together these findings suggests that higher perceptions of AUD self-stigma are generally associated with lower quantity and problems associated with alcohol, with slight variations in strength and significance of associations across difference facets of self-stigma.

Proximity to AUD Mean Differences

To examine the relevance of proximity to AUD with self-stigma, alcohol use behaviors and alcohol use outcomes, we ran a series of independent t-tests

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where means across each variable of interest were compared between individuals who endorse knowing someone with a diagnosed AUD ($n = 747$) and individuals who do not endorse knowing someone with a diagnosed AUD ($n = 2,422$). Results of the independent samples t-test revealed significant differences for BYAACQ scores, $t(2155) = -2.97$, $p = .003$, 99% CI[-1.07, -0.08], such that people who endorsed knowing someone with a diagnosed AUD reported higher BYAACQ scores ($M = 4.52$, $SD = 3.82$) than people who do not endorsed knowing someone with a diagnosed AUD ($M = 3.95$, $SD = 3.94$). Results revealed similar effects for NSE, $t(1297) = -3.89$, $p < .001$, 99% CI[-0.98, -0.20], and NSEF, $t(1395) = -5.22$, $p < .001$, 99% CI[0.33, -0.45], where people who endorsed knowing someone with a diagnosed AUD reported higher NSE scores ($M=21.39$, $SD= 3.59$) and NSEF scores ($M = 20.37$, $SD = 3.94$) than people who do not endorse knowing someone with a diagnosed AUD (NSE, $M = 20.80$, $SD = 3.77$; NSEF, $M = 19.48$, $SD = 4.49$). No significant differences between individuals endorsing knowing someone with AUD and individuals not endorsing knowing someone with AUD on the remaining study variables were found, including Alcohol Typical Quantity $t(2003) = -0.77$, $p = .444$, 99% CI[-1.45, 0.79], Alcohol Use Frequency $t(2003) = -1.32$, $p = .186$, 99% CI[-0.64, 0.21], and Alcohol Binge Frequency $t(2157) = -1.38$, $p = .169$, 99% CI[-0.57, 0.17].

Proximity to AUD Moderation Models

To explore the interaction that self-stigma may have with proximity to AUD, we ran a series of moderation models where self-stigma, specifically NSE

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and NSEF, were the predictor variables, proximity to AUD was the moderator, and the outcomes included Alcohol Use Frequency, Alcohol Typical Quantity, 30 Day Alcohol Binge Frequency, and Alcohol Use Consequences. We found no significant interaction effects between either NSE or NSEF and proximity on any of the study variables, Alcohol Use Frequency, Alcohol Typical Quantity, Alcohol Binge Frequency, and Alcohol Use Consequences, as outcomes. However, analyses did reveal significant main effects for NSE exclusively when no proximity to AUD was endorsed for with weekly quantity ($\beta = -.12, p < .001, 99\% \text{ CI } [-0.19, -0.06]$), weekly frequency ($\beta = -.12, p < .001, 99\% \text{ CI } [-0.18, -0.05]$), 30 day binge ($\beta = -.07, p = .009, 99\% \text{ CI } [-0.13, -0.001]$), and BYAACQ scores ($\beta = -.11, p < .001, 99\% \text{ CI } [-0.18, -0.05]$).

Similarly, analyses pointed to weak simple main effects for NSEF, when no proximity to AUD was endorsed with weekly quantity ($\beta = -.09, p < .001, 99\% \text{ CI } [-0.15, -0.02]$) and weekly frequency ($\beta = -.12, p < .001, 99\% \text{ CI } [-0.19, -0.06]$). In the BYAACQ model, a main effect of Proximity to AUD on BYAACQ scores ($\beta = 0.14, p = .005, 99\% \text{ CI } [0.01, 0.28]$) was demonstrated. The full results of these moderation models, including 99% CIs are presented in Table 2 for NSE and Table 3 for NSEF.

Study One Discussion

The purpose of Study 1 was to replicate and expand on the findings of prior studies on self-stigma of SUD, focusing on alcohol use and self-stigma of AUD and limited to individuals who have not been diagnosed with an AUD.

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Specifically, Study 1 intended to explore ratings of AUD self-stigma across distinct alcohol use backgrounds and further establish a negative relationship between perceived self-stigma and alcohol use behavior such that higher ratings of self-stigma of AUD would relate to less reported quantity and frequency of alcohol consumption, fewer days of bingeing over the last 30 days, and fewer negative alcohol related consequences (though only for NSE). Further, in Study 1 we aimed to introduce the idea of proximity to AUD and find evidence for its interaction with self-stigma to produce distinct alcohol use behaviors and outcomes. The results revealed that average self-stigma scores differed between individuals who have consumed alcohol in their life, such that they had higher scores on NSEF stigma than individuals who have never consumed alcohol in their life or who consume alcohol regularly enough to have endorsed consuming alcohol in the last 30 days. Though similar results were anticipated with NSE, the present data did not provide evidence for this effect. The null results for NSE points to, perhaps, a potential difference in the way distinct facets of self-stigma work relative to alcohol consumption such that NSEF tends to be more internally focused while NSE tends to indicate more of the expected effects of social belonging and stereotype threats (Corrigan et al., 2006). In investigating that specifically, correlations, in line with previous research, did reveal that higher rating of self-stigma, both NSE and NSEF were associated with less drinking frequency, quantity, bingeing, and fewer alcohol use consequences. Together, these results further fall in line with theoretical frameworks (e.g., theory of

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planned behavior) such that significant differences lie primarily in the segment of individuals who have tried alcohol but not in recent time, suggesting that these individuals may feel the relevance of self-stigma as people who have used substances and made the deliberate decision to limit their drinking because of this factor. This is further demonstrated by individuals who have engaged in regular drinking (i.e., in past 30 days), where, despite endorsing recent alcohol use, reported less frequent use, less quantity, and fewer consequences.

In exploring proximity to AUD, we found that there were significant differences in the alcohol use behaviors and consequences reported by people who endorse knowing an individual with a diagnosed AUD versus not knowing an individual with and endorsed AUD. Participants who endorsed knowing an individual with AUD tended to report more negative alcohol use consequences as well as more self-stigma on either facet, NSE or NSEF. These results suggest that while knowing individuals with an AUD might not relate to differences in drinking behaviors, it does, for some relate to differences in the outcomes of those drinking behaviors, perhaps as a result of environmental and social factors to be discussed later, and for some relate to differences in self-stigma around the condition, perhaps as a result of witnessing the stigma an individual with AUD experiences or witnessing the determinantal effects of AUD itself (McCallum et al., 2016; Young, 2011). Finally, in testing stigma and proximity to AUD in a single model, no interaction effects were revealed, suggesting that though stigma

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and proximity both relate to specific alcohol use behaviors, outcomes, and attitudes, these two constructs may operate in distinct spheres.

Study Two

The primary aim of Study Two was to replicate the findings of Study 1, examining mean differences in perceptions of self-stigma between college students of different alcohol use backgrounds and measuring the demonstrated associations between perceived-self stigma, lifetime proximity to AUD, and present alcohol use behaviors. As the associations of perceived-self-stigma and lifetime proximity to AUD with AUD symptoms specifically were not assessed in Study One due to unavailability of an alcohol use disorder symptom measure, Study Two expanded on the variables of interest to include AUD symptom scores. Associations of self-stigma and proximity to AUD with AUD symptoms could differ from the existing study variables as AUD symptoms is an explicit measure of disordered use. In the prior study, self-stigma and proximity tended to show stronger associations with measures of problematic use rather than general use. We hypothesized that results would be akin to that in Study One, where self-stigma scores would differ significantly across distinct life-time alcohol use backgrounds, higher self-stigma scores would relate to decreased engagement with alcohol and fewer signs of problematic alcohol use. Further, we hypothesized the direction of these associations would be consistent with the additional measure of alcohol use disorder symptoms such that higher self-stigma would be associated with fewer alcohol use disorder symptoms. Regarding the moderating role lifetime proximity to AUD, given the null findings of Study 1, we did not expect to find evidence for moderation. However, as we

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included a new variable, AUD symptoms, we conducted exploratory moderation analyses to ensure the findings of Study 1 are consistent with a prominent facet of problematic alcohol use.

Methods

Participants

Participants were college students enrolled at William & Mary over the age of 18 that agreed to come into a lab space to complete a survey exploring substance use behaviors. Participants were recruited from the Psychology Department Participant Pools (i.e., SONA) during the Fall of 2022. Participants who signed up for the study via SONA were asked to pick a time slot to come to the lab room and complete a Qualtrics survey in person on a lab computer. Upon coming in, students were briefed by a researcher and then led to a computer where the Qualtrics survey was pulled up in advance. The Qualtrics survey began with an informed consent which students read and were required to sign before they could proceed with the study. From there participants were led through a brief experimental study exploring perceptions of AUD in vignette characters. After reading the three vignettes and filling out the corresponding questions, participants were asked to fill out a final battery of measures that included but was not limited to questions about their personal alcohol use, including consequences and AUD symptoms, proximity to individuals with AUD, and perceived self-stigma of alcohol use. The total study took approximately 30

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minutes to complete. Upon completion, participants were granted SONA credit for participating. The university IRB approved all procedures.

As in Study One, the analytic sample for this study was limited to students in the 18 to 25 age range who completed questions about their own alcohol use practices, self-stigma of substance use, proximity to individuals with substance use disorder, and reported no official diagnosis of AUD ($n = 299$). Among our analytic sample, the majority indicated that they identified as female ($n = 196$, 68.3%) and white, non-Hispanic ($n = 185$, 61.9%). Further 17.1% of individuals reported never having consumed alcohol ($n = 46$), 23.8% reported having consumed alcohol in their lifetime but not recently ($n = 64$), and 59.1% reported having consumed alcohol within the last 30 days ($n = 159$).

Measures

Consistent with Study One, the exact same measures of Alcohol Use (Frequency, Quantity, Binge Drinking Frequency), Alcohol Use Consequences (B-YAACQ), Perceived Self-Stigma of AUD, and Proximity to AUD were collected. In addition to the measures of Study One used for Study Two, a measure of AUD symptoms was collected (described below).

AUD symptoms. To assess AUD symptoms, we employed a modified version of the 10-item Alcohol Use Disorders Identification Test (i.e., Alcohol Use Disorder Identification Test – US [AUDIT-US]; Higgins-Biddle & Babor, 2018), originally created by Saunders and colleagues (Saunders et al., 1993). The AUDIT is a widely used measure based on the DSM diagnostic criteria for AUD,

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providing insight into an individual's endorsement of symptoms of AUD, and in the modified version used for the present study has been updated to reflect NIAAA guidelines for harmful to low-risk drinking (Madson et al., 2020).

Specifically, in the modified version of the AUDIT used in the present study, the response options for Items 1-3 regarding drinking frequency are slightly adjusted to reflect a different scale. Further, the wording for Item 3 is adjusted to reflect the U.S. gender-specific definition of heavy episodic drinking (i.e., frequency of drinking 4+/5+ standard drinks [14 grams of alcohol] for women/men in a drinking period). Participants were presented with a series of 10 statements regarding their drinking behaviors (e.g. *"How often do you have a drink containing alcohol?"*, *"Have you or someone else been injured because of your drinking?"*) and seven, five, or three answer choices depending on the scope of the question. As a result of experimenter error, item number eight of the AUDIT (*"How often during the last year have you been unable to remember what happened the night before because of your drinking?"*) was presented with the wrong answer choices, leading the questions responses for that item be unworkable. A total score was calculated per the standard procedure recommended for the measure, by summing the scores across the items, apart from item eight, which was excluded from the total score.

Analyses Plan

The analyses for Study Two were identical to the analyses for Study one, with the inclusion of AUDIT score as an additional alcohol use behavior variable

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in the correlation analyses between perceived self-stigma and the alcohol use behavior variables, t-tests between lifetime proximity to AUD, and alcohol use behavior variables, and the analyses of moderation by lifetime proximity to AUD between perceived self-stigma and alcohol use behaviors. Like in Study One, all the analyses described were conducted using IBM SPSS Statistics (Version 27). The simple moderation analyses were conducted using the PROCESS 4.1 macro for SPSS (Hayes, 2017).

Given the smaller sample size, significance was determined using a $p < .05$ cut off for the ANOVA and corresponding post-hoc Bonferroni tests. A 95% confidence interval was used to determine significance for the correlations between perceived self-stigma and alcohol use behaviors as well as the lifetime proximity to AUD t-tests. For the moderation analyses, statistical significance was also determined by 95% bootstrapped confidence intervals (based on 10,000 bootstrapped samples) that do not contain zero, and interactions were probed at low (1 SD below the mean), medium (average levels), and high levels (1 SD above the mean of the moderator).

Study Two Results

Perceptions of AUD Self-Stigma Across Alcohol Use Backgrounds

Descriptive statistics of all study 2 variables and reliability statistics for relevant measures are presented in Table 3. Consistent with Study 1, in examining differences on self-stigma between different alcohol use backgrounds ($n = 299$), the ANOVA revealed no significant differences on NSE scores

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between different alcohol use backgrounds, No Lifetime Use ($M = 22.35$, $SD = 2.69$), Lifetime Use ($M = 21.28$, $SD = 3.12$), and Last 30 day Use ($M = 21.16$, $SD = 3.28$), $F(2, 226) = 2.57$, $p = .08$, $\eta^2 = .02$) Similarly, the ANOVA revealed no differences on NSEF scores of people with different alcohol use backgrounds, No Lifetime Use ($M = 21.17$, $SD = 2.89$), Lifetime Use ($M = 20.36$, $SD = 3.30$), and Last 30 Day Use ($M = 20.60$, $SD = 3.64$), $F(2,226) = 0.78$, $p = .46$, $\eta^2 = .006$.

Correlations with Alcohol Use Behaviors and Outcomes

Bivariate correlations among Study 2 variables are reported in Table 4. At the bivariate level, NSE was significantly positively associated with NSEF ($r = .66$). Looking at alcohol use behaviors, NSE was significantly negatively correlated with weekly alcohol quantity consumed ($r = -.19$), weekly frequency of drinking ($r = -.26$), 30-day frequency of binge ($r = -.19$), B-YAACQ scores ($r = -.19$), and AUDIT scores ($r = -.21$). Similarly, NEF was significantly negatively correlated with weekly alcohol quantity consumed ($r = -.18$), weekly frequency of drinking ($r = -.22$), 30 day frequency of binge ($r = -.19$), B-YAACQ scores ($r = -.19$), and AUDIT scores ($r = -.21$). This aligns with the findings of Study 1 and provides further evidence that higher perceptions of AUD self-stigma are generally associated with lower quantity and problems associated with alcohol use.

Proximity to AUD Mean Differences

As with Study 1, to examine the relevance of proximity to AUD with self-stigma, alcohol use behaviors and alcohol use outcomes, we ran a series of

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paired t-tests where means across each variable of interest were compared between individuals who endorse knowing someone with a diagnosed AUD ($n = 55$) and individuals who do not endorse knowing someone with a diagnosed AUD ($n = 244$).

Results of the independent samples T-test revealed significant differences only for NSE, $t(297) = -2.32$, $p = .02$, 95% CI[-1.96, -0.16], such that people who endorsed knowing someone with a diagnosed AUD reported higher NSE scores ($M = 22.38$, $SD = 2.85$) than people who did not endorse knowing someone with a diagnosed AUD ($M = 21.32$, $SD = 3.11$). No significant differences between individuals endorsing knowing someone with AUD and individuals not endorsing knowing someone with AUD on the remaining Study 2 variables were found, including NSEF $t(297) = -2.32$, $p = .103$, 95% CI[-1.80, 0.17], Alcohol Typical Quantity $t(175) = -0.85$, $p = .395$, 95% CI[-3.72, 1.47], Alcohol Use Frequency $t(175) = -0.71$, $p = .480$, 95% CI[-0.89, 0.42], Alcohol Binge Frequency $t(53.912) = -1.67$, $p = .100$, 95% CI[-2.02, 0.02], BYAACQ $t(187) = -1.88$, $p = .061$, 95% CI[-2.49, 0.05], and AUDIT $t(71) = -1.33$, $p = .186$, 95% CI[-3.11, 0.45].

Proximity to AUD Moderation Models

As with Study 1, to explore the interaction that self-stigma may have with proximity to AUD, we ran a series of moderation models where the two facets of self-stigma, NSE and NSEF, were the predictor variables, proximity to AUD was the moderator, and the outcomes included Alcohol Use Frequency, Alcohol Typical Quantity, 30 Day Alcohol Binge Frequency, Alcohol Use Consequences,

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and AUDIT scores. In line with the last study, we found no significant interaction effects between either NSE or NSEF and proximity on any of the Study 2 variables, Alcohol Use Frequency, Alcohol Typical Quantity, Alcohol Binge Frequency, Alcohol Use Consequences, and AUDIT scores as outcomes. However, as with Study 1, moderation analyses did reveal significant main effects for NSE exclusively when no proximity to AUD was endorsed with weekly frequency ($\beta = -.20$, $p = .033$, 95% CI [-0.38, -0.02]), BYAACQ scores ($\beta = -.19$, $p = .046$, 95% CI [-0.37, -0.003]), and AUDIT scores ($\beta = -.26$, $p = .005$, 95% CI [-0.44, -0.08]).

Analyses for NSEF revealed simple main effects with AUDIT scores when proximity to AUD was not endorsed ($\beta = -.24$, $p = .030$, 95% CI [-0.41, -0.07]), as well as when proximity to AUD was endorsed ($\beta = -.38$, $p = .006$, 95% CI [-0.73, -0.04]). Analyses also revealed main effect of proximity to AUD and 30-day binge ($\beta = .37$, $p = 0.047$, 95% CI [0.01, 0.73]). Simple effects were identified for NSEF, again, when no proximity to AUD was endorsed for weekly frequency ($\beta = -.38$, $p = .033$, 95% CI [-0.74, -0.03]). The full results of these moderation models, including 95% CIs are presented in Table 5 for NSE and Table 6 for NSEF.

Study Two Discussion

The purpose of Study 2 was to replicate the findings of Study 1 exploring associations between AUD self-stigma, proximity to AUD, and alcohol use behaviors, in a smaller more targeted sample. Further, per the findings of Study 1, as both facets of self-stigma and proximity to AUD related more to measures

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of problematic use, Study 2 incorporated an explicit measure of alcohol use disorder symptoms. Study 2 results generally aligned with those of Study 1, though it is important to note that the Study 2 sample was far smaller than that of Study 1, making achieving sufficient power for statistical significance more challenging. Although Study 2 results proved to be less statistically significant, the effect sizes tended towards being slightly stronger than those of Study 1.

In Study 2, there were no significant findings in terms of differences in self-stigma scores across different alcohol use backgrounds, though the overall means of each background suggested, contrary to prior studies (Chentsova et al., 2023) and Study 1 findings, that individuals with no past alcohol use were highest in self-stigma on either facet, rather than individuals with lifetime alcohol use. This pattern may be a result of the small and self-selecting sample that was used, given that participants were provided a brief description of the study explaining its focus on substance use and the requirement people come in person to participate. Looking at the correlations between self-stigma and various alcohol use behaviors and outcomes, the observed effects were in line with those in Study 1, such that higher ratings of self-stigma, both NSE and NSEF, generally related significantly with less frequency of drinking, less frequency of binge drinking, and less alcohol use consequences. Additionally, AUD symptoms moderately correlated negatively with either facet of self-stigma, suggesting that indeed, higher ratings of self-stigma might not relate to less quantity of drinking but does relate to fewer symptoms of problematic drinking.

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Turning towards proximity to AUD, again, Study 2 revealed similar findings to those of Study 1, where for people who endorsed knowing someone with a diagnosed AUD, average scores for stigma (both NSE and NSEF), frequency, quantity, binge frequency, negative alcohol use consequences, and alcohol use disorder symptoms were all higher than for individuals who did not endorse knowing someone with a diagnosed AUD. However, of these differences, only that of NSE was significant, pointing to, perhaps, limitations due to sample size, but also providing some foundation for future exploration.

Finally, in testing stigma and proximity to AUD in a single model, again, no significant interaction effects were revealed, even for AUD symptoms. It should be noted, however, that simple main effects were identified for AUD symptoms and NSEF where the strength of relationship between NSEF and AUD symptoms was stronger in individuals endorsing proximity to AUD compared to those who were not.

General Discussion

Alcohol is not only the most widely used substance across the US, but also the most widely used substance among young adults, with over 50.1% endorsing use in the last 30 days (Substance Abuse and Mental Health Services Administration, 2022). It follows that, with such a high prevalence rate of alcohol use, there is some concern for the development of problematic use or disordered use. Though not every young adult engaging in alcohol use is necessarily engaging in problematic use, 15.0% of young adults last year met the criteria for AUD (Substance Abuse and Mental Health Services Administration, 2022). This highlights the importance of research for not only treatment and recovery solutions, but also prevention and early identification of problematic alcohol use and AUD. A variety of personality, motivation, and environmental factors have all been studied to better understand problematic alcohol use and AUD (Kulesza et al., 2013). Social factors, on the other hand, and particularly stigma, have received less attention, especially as it functions in individuals who do not have a diagnosed AUD.

The present study aimed to examine the relationship between self-stigma of AUD – specifically two facets of self-stigma, negative self-esteem stigma and negative self-efficacy stigma – with alcohol use behaviors, consequences, and disorders symptoms in young adults. Taking into account that perceptions of stigma can be largely influenced by familiarity with individuals experiencing that stigma (McCann & Lubman, 2018; O'Shay-Wallace, 2020), the present study

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further expanded to explore if simply knowing someone with a diagnosed AUD could have an effect on self-stigma and alcohol use behaviors, consequences, and disorder symptoms. In Study 1 we examined these relationships across a national sample of college students in the U.S., with a focus on understanding self-stigma, proximity to AUD, and alcohol use consequences. In Study 2, we replicated these findings in a localized sample and included a measure of AUD symptoms to enhance our models.

Together the findings of our research demonstrate a few key things. First our research demonstrated that self-stigma ratings differ across different lifetime alcohol use backgrounds. Specifically, we saw in Study 1 that individuals who reported lifetime alcohol use held greater self-stigma ratings than individuals who never reported alcohol use or individuals who reported alcohol use within the last 30 days. This aligns with our hypotheses that, for individuals who have engaged in alcohol use behaviors broadly, higher self-stigma would be associated less engagement in alcohol, such that they would not endorse alcohol use behaviors conducive to problematic drinking, such as recent use (Schomerus, Lucht, et al., 2011; Wallhed Finn et al., 2014). However, this one was not found in Study 2, perhaps as a result of confounding variables like race or gender that may have accounted for more of the hypothesized effect that originally anticipated.

In examining impact of stigma on alcohol use behaviors among those who consume alcohol regularly, results across both Study 1 and Study 2 fell in line with previous research and supported hypotheses that for non-clinical

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populations, that is, for young adults not diagnosed with AUD, higher self-stigma scores, on both negative self-esteem self-stigma and negative self-efficacy self-stigma, generally relate to lower drinking frequency, lower drinking quantity, fewer days of binge drinking, fewer alcohol use consequences, and fewer symptoms of AUD. Though these associations were relatively weak, most of the associations identified were significant across both studies.

As mentioned in the discussion section for Study 1, these first two key findings fall in line with expectations given the framework of the theory of planned behavior (Ajzen, 1991) such that for individuals who have engaged in alcohol use, they may choose to not continue using alcohol or limit their engagement as they are conscious of self-stigma that could be associated with development of AUD. That is, higher perceived levels of AUD self-stigma in individuals who do not have AUD may activate some avoidance motive and aversion to, or motive to educate and closely monitor oneself about substance use that is protective against AUDs (Brown et al., 2015). This would also be in line with research on the flipside of this paradigm, demonstrating that favorable attitudes and expectancies about substance use often relate to more problematic substance use down the line (Stone et al., 2012). Related, research has demonstrated that, in individuals who endorse drinking behaviors, particularly not yet at the level of problematic drinking, people express increased levels of public stigma, perhaps as a result of an attempt to reinforce negative alcohol stereotypes and “other”

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individuals engaging in problematic drinking or with AUD, while protecting their own less-problematic drinking behaviors (Morris et al., 2023).

The third key findings focus on the relevance of proximity to AUD and one's own alcohol use beliefs, behaviors and outcomes. Though moderation analyses revealed little in terms of interaction effects, providing us little reason to believe that proximity to AUD could moderate the relationship between perceived self-stigma and alcohol use behaviors and outcomes, t-tests, main effects, and simple main effects did reveal significant associations between stigma, alcohol use behaviors, and alcohol use outcomes. Specifically, endorsed proximity with AUD related to higher ratings of stigma, higher endorsements of alcohol use behaviors, and higher scores on alcohol use consequences and disorder symptoms. The findings are in line with existing literature on proximity to AUD and stigma, such that previous research demonstrates that knowing an individual with AUD and more specifically witnessing the stigma the experience can bring an individual's awareness closer to that stigma and ultimately increase perceptions of stigma (Merrill & Monti, 2015) which in turn may be internalized as self-stigma (Hammarlund et al., 2018; Vogel et al., 2013). Further these findings associating proximity to AUD with various alcohol use behaviors and outcomes can be attributed to a variety of possible factors. For instance, knowing an individual with an AUD may be indicative of a shared environment where there are multiple risk factors for AUD present, such as some phenotypic predisposition (Coley et al., 2017), prolonged exposure to stress (McCaul et al.,

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2017), and adverse or traumatic experiences (Dube et al., 2002). In another case, seeing an individual one cares about in distress, experiencing health concerns, or in more extreme cases, losing a loved one, as a result of AUD can lead to increased internalized symptoms such as depressive symptoms which in turn may be associated with problematic alcohol use behaviors like increased drinking to cope (Lander et al., 2013).

The null results of the moderation analyses, on the other hand, could also suggest that proximity alone may not be a sufficient indicator of the type of proximity that would interact with AUD self-stigma or alcohol use behaviors. Perhaps there may be some nuance to the type of proximity (e.g., the nature of the relationship with an individual) that may influence how one responds to knowing and individual with an AUD. Though literature on this particular topic is limited, in research on other highly stigmatized identities, such as for individuals living with autism, studies have shown that stigma can be more prominent or invasive when the stigmatized individual exhibits undesirable characteristics, such as aggression (Swaab et al., 2021). Similar findings have been found for individuals who exhibit greater symptoms for SUD (Atlam & Coşkunol, 2022), which, in the context of proximity, may suggest differences in experiences of stigma in response to knowing someone who has explicit AUD symptoms that is untreated versus someone who is in treatment with controlled symptoms. Alternatively, proximity and self-stigma may simply work through two completely distinct mechanisms and there is no reason to believe that familiarity with an

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individual can influence how self-stigma associates with alcohol use behavior and outcomes. It is important to note here, that the effect sizes of our t-tests and strength of bivariate associations were typically weak to moderate, which may also feed into why we saw no statistically significant interactions.

Limitations and Future Directions

These noteworthy implications should be taken with consideration of the study limitations and, instead of guiding clinical practice directly, should be understood as a springboard for a new area of research in AUD prevention and early intervention research. The most prominent limitations of our study, perhaps, are in regard to the target population and the make-up of our sample. Though our study intended to explore self-stigma in young adults, our sample came primarily from college populations. There is an abundance of literature highlighting potential differences in alcohol use practices as well as risk factors for young adults in a college setting versus in a community setting (Carter et al., 2010; Slutske, 2005). Future research may want to explore such cultural differences in young adults as an additional moderator. Further, our sample consistent in majority of students assigned female at birth. As a large body of existing research suggests that there are significant gender differences in stigmatization of substance use (Brady & Randall, 1999; Meyers et al., 2021), further analyses are needed to explore these potential differences in self-stigmatization. Finally, the present study was intended to examine self-stigma in non-clinical populations based off of self-reported AUD diagnosis. It is fully possible that a non-negligible

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portion of our sample did not have an AUD diagnosis but meet AUD criteria, as studies report up to 13.0% of college students do meet this criteria (Substance Abuse and Mental Health Services Administration, 2022). Future research may want to screen people of this category and further investigate if perhaps individuals themselves can identify problematic behaviors and thus have different relationships with self-stigmatization of AUD, being closer to AUD, than an individual significantly under the AUD symptom threshold.

Another important limitation to address is the nature of our study design being cross-sectional and the limited causal claims we can make based off our limited understanding of the temporal order in the associations observed. Though some theories, like the theory of planned behavior (Ajzen, 1991) and research such that linking positive expectations of substance use with negative substance use outcomes (Stone et al., 2012) give us reason to think that self-stigma may be leading people to restrict their drinking behaviors or engage in protective behavioral strategies to avoid engaging in problematic alcohol use, there is sufficient research to propose a model of the other way, where perhaps limited drinking behaviors and increased engagement in protective behavioral strategies may lead students to justify the behavior as necessary after the fact. Especially in young adults where risky drinking culture is so normalized, some individuals may feel ostracized for their limitation in alcohol engagement (Borsari & Carey, 2001) and thus through some form of cognitive dissonance (Festinger, 1962), that is, recognizing that perhaps their behaviors of non-drinking do not necessarily align

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with their identity to be a part of young adult culture, justify their disinterest in alcohol with self-stigma of AUD. Establishing temporal order, especially in relating self-stigma to substance use behaviors and outcomes, will be critical in understanding how to leverage the demonstrated associations for the development of prevention or early intervention programs. Specifically, if it is confirmed that self-stigma precedes alcohol use behaviors, then future research may want to explore more on what mechanisms self-stigma helps regulate alcohol use behaviors such as the potential for how knowledge of the health risks associated with AUD can influencing alcohol use behaviors (McKee & Weinberger, 2013) or how personality traits related to valuation of self-image can guide responses to stigma (Miller & Kaiser, 2001). On the other hand, if alcohol use behaviors precede self-stigma, perhaps it will be important to identify what mechanisms underly the initial decisions to limit alcohol use behaviors and further how and why self-stigma may change over time with stable alcohol use practices.

Finally, regarding proximity to AUD, our studies only took into consideration the simple question of if participants knew an individual with an alcohol use disorder. The study did not consider how many people a participant knew, how close the participant was to the individual they endorsed knowing, the nature of the relationship between the participant and the individual with a diagnosed AUD, and the outcome of the endorsed individuals battle with AUD (in recovery, continued use, death, etc.). Variability in number of people endorsed

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and familiarity with those may have impacted the strength of association for participants endorsing knowing someone with a diagnosed AUD as participants who are knowledgeable of but have had limited interaction with the individual may not see the same effects on self-stigma or alcohol use variables. Further, the present study did not account for the nature of the relationship between the participant and individual endorsed. It is reasonable to believe, per the discussion above, that the nature of the relationship (positive versus negative) between the participant and the individual diagnosed with an AUD could impact what the participant takes away from their interactions. Future studies should examine this to better understand through which mechanisms proximity to AUD relates to self-stigma, alcohol use behaviors, and alcohol use outcomes. Additionally, the present study was focused solely on AUD and alcohol use behaviors. Given recent literature exploring polysubstance use and polysubstance attitudes (Bravo et al., 2021; Merrin & Leadbeater, 2018) future research should examine whether knowing anyone with a diagnosed SUD of any kind has a different association with alcohol use and further, if knowing someone with SUD perhaps negates some of the effect of knowing someone with an AUD, given that stigma around substance beyond alcohol is highly prevalent (Yang et al., 2017).

Conclusion

Overall, the present studies establish a foundation for future studies to examine these relationships more deeply to establish causality and identify the specific factors within self-stigma that may be useful as a protective factor so that

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clinicians and public health experts alike can leverage these in education campaigns and legislature averting development of AUD in young adults, or useful as identification factors so that clinicians and public health experts can identify and target individuals who may be engaging in problematic use or exhibiting early signs of AUD without wanting to acknowledge them.

Understanding how self-concept and self-valuation occurs for emerging adults could lead to improvements in wellness programs, prevention initiatives, intervention for motivation, and overall new insights into addiction treatment.

Clinicians and public health officials need to understand that how they address the alcohol use of individuals engaging in non-clinical alcohol use in preventing development of AUD must be done carefully and with consideration to the residual effects that may have on individuals with substance use disorders, especially if targeting efforts on social and cultural level.

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Table 1

Bivariate Correlations among Study Variables in Total Sample of Study One

	1	2	3	4	5	6	7	8	9	<i>M</i>	<i>SD</i>
1. Stigma – NSE	<u>.85</u>									20.94	3.75
2. Stigma – NSEF	.41	<u>.80</u>								19.69	4.38
3. Weekly Quantity	-.14	-.10	---							9.93	8.53
4. Weekly Frequency	-.12	-.12	.78	---						3.90	3.23
5. 30-Day Binge	-.09	-.01	.65	.44	---					2.31	2.92
6. BYAACQ	-.09	.02	.46	.35	.48	<u>.85</u>				4.09	3.92
7. Proximity to AUD (0=No, 1=Yes)	.07	.09	.02	.03	.03	.06	---			0.23	0.42
8. Gender (0=men, 1=women)	.14	.05	-.23	-.12	-.15	-.02	.11	---		0.74	0.44
9. Age	.00	-.01	.06	.10	.06	.05	.00	-.13	---	19.00	1.23

Note. NSE = Negative Self Esteem Self-Stigma, NSEF = Negative Self Efficacy Self-Stigma, Weekly Quantity = Winsorsized number of standard drinks consumed on an average week, Weekly Frequency = Number of drinking blocks (four hour period of time) engaged in on an average week, 30-Day Binge = Number of days in last 30 days with more than 4+/5+ drinks consumed in 2 hours or less for Women/Men, BYAACQ = Brief Young Adult Alcohol Consequences Questionnaire score, Proximity to AUD = Endorsement of knowing an individual with a diagnosed alcohol use disorder. Significant correlations ($p < .01$) are bolded for emphasis. Relevant Cronbach's alphas are underlined and shown on the diagonals of multi-item measures.

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Table 2

Summary of standardized effects of moderation models from Study 1 (Self-Stigma Negative Self Esteem)

Outcome Variable: Weekly Quantity	β	99% CI
Self-Stigma NSE	-.12	-0.19, -0.06
Proximity to AUD	.10	-0.03, 0.22
Self-Stigma NSE X Proximity to AUD	.06	-0.07, 0.20
Effect of NSE with No Endorsed Proximity to AUD	-.12	-0.19, -0.06
Effect of NSE with Endorsed Proximity to AUD	-.06	-0.18, 0.06
Outcome Variable: Weekly Frequency	β	99% CI
Self-Stigma NSE	-.12	-0.18, -0.05
Proximity to AUD	.09	-0.03, 0.23
Self-Stigma NSE X Proximity to AUD	.01	-0.12, 0.15
Effect of NSE with No Endorsed Proximity to AUD	-.12	-0.18, -0.05
Effect of NSE with Endorsed Proximity to AUD	-.10	-0.22, 0.02
Outcome Variable: 30-Day Binge	β	99% CI
Self-Stigma NSE	-.07	-0.13, -0.001
Proximity to AUD	.11	-0.02, 0.24
Self-Stigma NSE X Proximity to AUD	-.02	-0.16, 0.11
Effect of NSE with No Endorsed Proximity to AUD	-.07	-0.13, -0.001
Effect of NSE with Endorsed Proximity to AUD	-.09	-0.21, 0.03
Outcome Variable: BYAACQ	β	99% CI
Self-Stigma NSE	-.11	-0.18, -0.05
Proximity to AUD	.16	0.03, 0.29
Self-Stigma NSE X Proximity to AUD	.04	-0.09, 0.18
Effect of NSE with No Endorsed Proximity to AUD	-.11	-0.18, -0.05
Effect of NSE with Endorsed Proximity to AUD	-.07	-0.18, 0.05

Note. Self-Stigma NSE = Negative Self Esteem Self-Stigma. The outcome variable of interest of each model is listed above model-specific values in bold. Significant effects are in bold typeface for emphasis and were determined by a 99% bias-corrected bootstrapped confidence interval (based on 10,000 bootstrapped samples) that does not contain zero. In each model, gender and age were entered as covariates.

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Table 3

Summary of effects of moderation models from Study 1 (Self-Stigma Negative Self-Efficacy)

Outcome Variable: Weekly Quantity	β	99% CI
Self-Stigma NSEF	-.09	-0.15, -0.02
Proximity to AUD	.11	-0.03, 0.24
Self-Stigma NSEF X Proximity to AUD	.02	-0.12, 0.17
Effect of NSEF with No Endorsed Proximity to AUD	-.09	-0.15, -0.02
Effect of NSEF with Endorsed Proximity to AUD	-.06	-0.20, 0.07
Outcome Variable: Weekly Frequency	β	99% CI
Self-Stigma NSEF	-.12	-0.19, -0.06
Proximity to AUD	.05	-0.03, 0.24
Self-Stigma NSEF X Proximity to AUD	.06	-0.11, 0.18
Effect of NSEF with No Endorsed Proximity to AUD	-.12	-0.19, -0.06
Effect of NSEF with Endorsed Proximity to AUD	-.09	-0.22, 0.05
Outcome Variable: 30-Day Binge	β	99% CI
Self-Stigma NSEF	.01	-0.05, 0.07
Proximity to AUD	.11	-0.02, 0.24
Self-Stigma NSEF X Proximity to AUD	-.08	-0.22, 0.07
Effect of NSEF with No Endorsed Proximity to AUD	.01	-0.05, 0.07
Effect of NSEF with Endorsed Proximity to AUD	-.07	-0.20, 0.06
Outcome Variable: BYAACQ	β	99% CI
Self-Stigma NSEF	.01	-0.05, 0.08
Proximity to AUD	.14	0.01, 0.28
Self-Stigma NSEF X Proximity to AUD	.02	-0.12, 0.17
Effect of NSEF with No Endorsed Proximity to AUD	.01	-0.05, 0.08
Effect of NSEF with Endorsed Proximity to AUD	.03	-0.10, 0.16

Note. Self-Stigma NSEF = Negative Self Efficacy Self-Stigma. The outcome variable of interest of each model is listed above model-specific values in bold. Significant effects are in bold typeface for emphasis and were determined by a 99% bias-corrected bootstrapped confidence interval (based on 10,000 bootstrapped samples) that does not contain zero. In each model, gender and age were entered as covariates.

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Table 4

Bivariate Correlations among Study Variables in Total Sample of Study Two

	1	2	3	4	5	6	7	8	9	10	<i>M</i>	<i>SD</i>
1. Self-Stigma – NSE	<u>.80</u>										21.52	3.09
2. Self-Stigma – NSEF	.66	<u>.73</u>									20.77	3.36
3. Weekly Quantity	-.19	-.18	---								8.74	7.18
4. Weekly Frequency	-.26	-.22	.73	---							2.92	1.81
5. 30-Day Binge	-.19	-.19	.78	.52	---						3.29	2.95
6. BYAACQ	-.19	-.19	.41	.27	.54	<u>.84</u>					3.85	3.68
7. AUDIT	-.21	-.21	.71	.51	.74	.71	<u>.78</u>				7.23	5.82
8. Proximity to AUD (0=No, 1=Yes)	.13	.09	.06	.05	.14	.14	.09	---			0.18	0.39
9. Gender (0=men, 1=women)	.14	.11	-.40	-.24	-.28	-0.2	-.21	-.02	---		0.68	0.47
10. Age	-.04	-.02	.01	.09	-.03	.05	.09	.07	-.10	---	18.86	0.90

Note. Self-Stigma – NSE = Negative Self Esteem Self-Stigma, Self-Stigma – NSEF = Negative Self Efficacy Self-Stigma, Weekly Quantity = Winsorsized number of standard drinks consumed on an average week, Weekly Frequency = Number of drinking blocks (four hour period of time) engaged in on an average week, 30-Day Binge = Number of days in last 30 days with more than 4+/5+ drinks consumed in 2 hours or less for Women/Men, BYAACQ = Brief Young Adult Alcohol Consequences Questionnaire score, AUDIT = Alcohol Use Disorders Identification Test Score, Proximity to AUD = Endorsement of knowing an individual with a diagnosed alcohol use disorder. Significant correlations ($p < .05$) are bolded for emphasis. Relevant Cronbach's alphas are underlined and shown on the diagonals of multi-item measures.

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Table 5

Summary of effects of moderation models from Study 2 (Self-Stigma Negative Self Esteem)

Outcome Variable: Weekly Quantity	β	95% CI
Self-Stigma NSE	-.08	-0.25, 0.09
Proximity to AUD	.17	-0.20, 0.54
Self-Stigma NSE X Proximity to AUD	-.17	-0.55, 0.21
Effect of NSE with No Endorsed Proximity to AUD	-.08	-0.25, 0.09
Effect of NSE with Endorsed Proximity to AUD	-.25	-0.59, 0.09
Outcome Variable: Weekly Frequency	β	95% CI
Self-Stigma NSE	-.20	-0.38, -0.02
Proximity to AUD	.10	-0.29, 0.49
Self-Stigma NSE X Proximity to AUD	.00	-0.39, 0.40
Effect of NSE with No Endorsed Proximity to AUD	-.20	-0.38, -0.02
Effect of NSE with Endorsed Proximity to AUD	-.19	-0.55, 0.16
Outcome Variable: 30-Day Binge	β	95% CI
Self-Stigma NSE	-.16	-0.34, 0.02
Proximity to AUD	.37	-0.01, 0.75
Self-Stigma NSE X Proximity to AUD	-.02	-0.41, 0.36
Effect of NSE with No Endorsed Proximity to AUD	-.16	-0.34, 0.02
Effect of NSE with Endorsed Proximity to AUD	-.18	-0.53, 0.16
Outcome Variable: BYAACQ	β	95% CI
Self-Stigma NSE	-.19	-0.37, -0.003
Proximity to AUD	.35	-0.04, 0.74
Self-Stigma NSE X Proximity to AUD	-.03	-0.44, 0.37
Effect of NSE with No Endorsed Proximity to AUD	-.19	-0.37, -0.003
Effect of NSE with Endorsed Proximity to AUD	-.22	-0.58, 0.14
Outcome Variable: AUDIT	β	95% CI
Self-Stigma NSE	-.26	-0.44, -0.08
Proximity to AUD	.21	-0.17, 0.59
Self-Stigma NSE X Proximity to AUD	.02	-0.37, 0.41
Effect of NSE with No Endorsed Proximity to AUD	-.26	-0.44, -0.08
Effect of NSE with Endorsed Proximity to AUD	-.24	-0.59, 0.11

Note. Self-Stigma NSE = Negative Self Esteem Self-Stigma. The outcome variable of interest of each model is listed above model-specific values in bold. Significant effects are in bold typeface for emphasis and were determined by a 99% bias-corrected bootstrapped confidence interval (based on 10,000 bootstrapped samples) that does not contain zero. In each model, gender and age were entered as covariates.

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Table 6

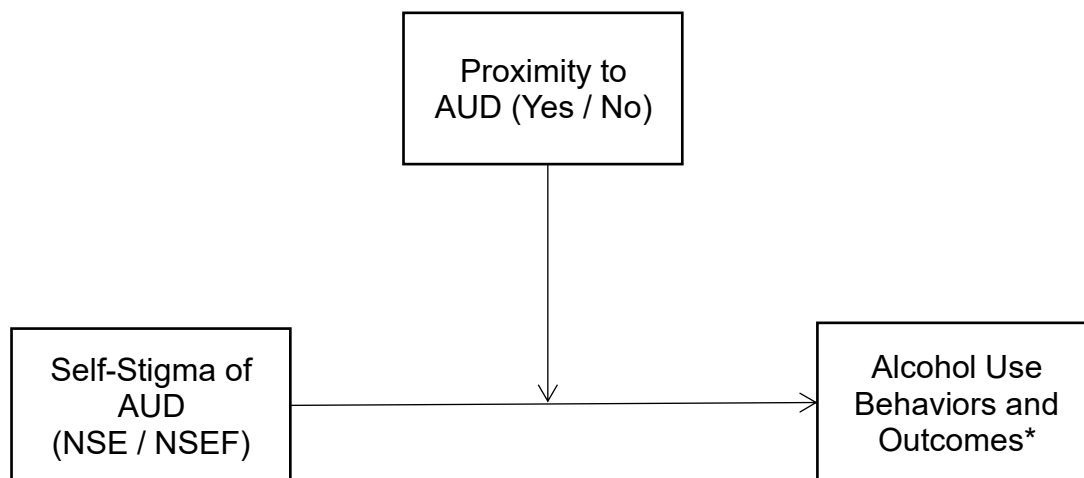
Summary of effects of moderation models from Study 2 (Self-Stigma Negative Self Efficacy)

Outcome Variable: Weekly Quantity	β	95% CI
Self-Stigma NSEF	-.13	-0.29, 0.04
Proximity to AUD	.13	-0.23, 0.49
Self-Stigma NSEF X Proximity to AUD	-.06	-0.44, 0.32
Effect of NSEF with No Endorsed Proximity to AUD	-.13	-0.29, 0.04
Effect of NSEF with Endorsed Proximity to AUD	-.19	-0.52, 0.15
Outcome Variable: Weekly Frequency	β	95% CI
Self-Stigma NSEF	-.14	-0.31, 0.04
Proximity to AUD	.12	-0.26, 0.50
Self-Stigma NSEF X Proximity to AUD	-.25	-0.64, 0.15
Effect of NSEF with No Endorsed Proximity to AUD	-.14	-0.31, 0.04
Effect of NSEF with Endorsed Proximity to AUD	-.38	-0.74, -0.03
Outcome Variable: 30-Day Binge	β	95% CI
Self-Stigma NSEF	-.14	-0.31, 0.03
Proximity to AUD	.37	0.01, 0.73
Self-Stigma NSEF X Proximity to AUD	-.18	-0.56, 0.21
Effect of NSEF with No Endorsed Proximity to AUD	-.14	-0.31, 0.03
Effect of NSEF with Endorsed Proximity to AUD	-.32	-0.67, 0.02
Outcome Variable: BYAACQ	β	95% CI
Self-Stigma NSEF	-.14	-0.32, 0.04
Proximity to AUD	.34	-0.04, 0.71
Self-Stigma NSEF X Proximity to AUD	-.20	-0.60, 0.20
Effect of NSEF with No Endorsed Proximity to AUD	-.14	-0.32, 0.04
Effect of NSEF with Endorsed Proximity to AUD	-.34	-0.70, 0.01
Outcome Variable: AUDIT	β	95% CI
Self-Stigma NSEF	-.24	-0.41, -0.07
Proximity to AUD	.20	-0.17, 0.56
Self-Stigma NSEF X Proximity to AUD	-.14	-0.53, 0.25
Effect of NSEF with No Endorsed Proximity to AUD	-.24	-0.41, -0.07
Effect of NSEF with Endorsed Proximity to AUD	-.38	-0.73, -0.04

Note. Self-Stigma NSEF = Negative Self Efficacy Self-Stigma. The outcome variable of interest of each model is listed above model-specific values in bold. Significant effects are in bold typeface for emphasis and were determined by a 99% bias-corrected bootstrapped confidence interval (based on 10,000 bootstrapped samples) that does not contain zero. In each model, gender and age were entered as covariates.

Figure 1

Conceptual Model of Proposed Moderated Models



*Study 1 examined eight simple moderation models, where the influence of Proximity to AUD as a moderator between each facet of Self-Stigma of AUD (NSE and NSEF) and each of the following Alcohol Use Behavior or Outcome variables were tested: Weekly Quantity, Weekly Frequency, 30-Day Binge Frequency, BYAACQ. Study 2 examined ten simple moderation models, where the influence of Proximity to AUD as a moderator between each facet of Self-Stigma of AUD (NSE and NSEF) and each of the following Alcohol Use Behavior or Outcome variables were tested: Weekly Quantity, Weekly Frequency, 30-Day Binge Frequency, BYAACQ, AUDIT.