A Psychometric Validation of an Adapted Withdrawal Intolerance Scale for Alcohol Withdrawal Syndrome

Sarah Nicole Najera
University of Texas at El Paso

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PSYCHOMETRIC VALIDATION OF AN ADAPTED WITHDRAWAL INTOLERANCE SCALE FOR ALCOHOL WITHDRAWAL SYNDROME

SARAH NICOLE NAJERA

Master’s Program in Clinical Psychology

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PSYCHOMETRIC VALIDATION OF AN ADAPTED WITHDRAWAL INTOLERANCE SCALE FOR ALCOHOL WITHDRAWAL SYNDROME

by

SARAH NICOLE NAJERA, B.A.

THESIS

Presented to the Faculty of the Graduate School of
The University of Texas at El Paso in Partial Fulfillment of the
Requirements for the Degree of

MASTER OF ARTS

Department of Psychology

THE UNIVERSITY OF TEXAS AT EL PASO

December 2023
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Abstract

While potentially life threatening, alcohol withdrawal is often under treated and inadequately integrated into the continuum of care for AUD. The current study served as part of a clinically impactful line of research by identifying key physical and psychological aspects of withdrawal. Using a measure previously developed for smoking cessation, a withdrawal intolerance measure was adapted (IDQ-A) and psychometrically validated. We aimed to establish construct validity of a three-factor model of the IDQ-A, convergent and discriminant validity, as well as predictive validity. Those highly motivated to quit drinking and high in alcohol dependence were recruited via specialized social media groups and asked to take a baseline and one-month follow-up survey. Results supported a two-factor model, along with overall support for convergent validity. Results were mixed in terms of discriminant and predictive validity, however the two-factor IDQ-A predicted completion of alcohol detoxification. Findings contribute to a clinically impactful program of research, with the goal of targeting risk factors that contribute to the risk of relapse after alcohol cessation. Given factors which predicted poor outcomes in the final validated model of the IDQ-A, the current findings may also begin to aid mental health professionals by initializing a tool to identify those most at risk for early relapse and augment the efficacy of their treatment programs.
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Chapter 1: Introduction

Alcohol Use Disorders and Dependence

Alcohol use disorders (AUD’s) in the U.S. are a prevalent issue, which affects millions of people, as 14.4 million adults have a diagnosed AUD as of 2018, and alcohol has become the third leading cause of preventable death as it kills nearly 100,000 people per year (NIAAA, 2020). Only a small fraction of those with an AUD receive treatment, and chronic alcohol use has been shown to increase one’s physical dependence on the drug, demonstrate detrimental effects on various vital organs, and contribute to health problems such as cirrhosis, liver disease, and certain cancers (NIAAA, 2020). While there may be several factors that can contribute to the disparity between the amount of people with alcohol use problems and treatment utilization, there is one which addresses an often overlooked, misunderstood, stigmatized aspect of alcohol addiction; withdrawal (Blondell et al., 2011, Zhu & Wu, 2018).

Likely, due to its social acceptability and widespread recreational use, alcohol use disorders are frequently underestimated in terms of severity of physical dependency and the difficulty of recovery when compared to other substances (Schomerus et al., 2011). The reality is that alcohol withdrawal is one of the most dangerous substances to withdraw from, as symptoms can include adverse physical and psychological phenomena such as severe flu-like symptoms, anxiety, autonomic symptoms, delirium tremens, seizures, and death (American
Psychological Association, 2013). Symptoms can develop within the first 12 to 24 hours after alcohol cessation, and their severity depends on clients’ duration of alcohol dependence, and the volume they usually drink (Newman et al., 2021). Many cases of alcohol withdrawal are found in emergency departments, as hospitalization forces alcohol cessation (Salottolo et al., 2017). Over half of clients with alcohol use problems going into one emergency department showed alcohol withdrawal symptoms, with a quarter progressing to delirium tremens and other severe symptoms (Newman et al., 2021). Depending on whether alcohol symptoms are treated, up to 15% of those who progress to severe symptoms die (Newman et al., 2021). Furthermore, from the point of alcohol cessation, withdrawal symptoms can last and progress up to a few days to a week, sometimes longer (Dakota et al., 2019). Yeh and others (2009) indicated avoiding withdrawal symptoms from alcohol as the reason for participants’ compulsive drinking as well as the desire to avoid pain. Thus, a dangerous cycle persists as those with AUD chronically drink, damage their health, but continue to do so to avoid drastic withdrawal symptoms (Becker, 2008; Hershon, 1977; Yeh et al., 2009; ). While detoxification programs and medical assistance exist for alcohol withdrawal, very small percentages seek these treatment routes, and their quality of care has received scrutiny (Blondell et al., 2011; Hayashida, 1998; NIH, 2021).

**Treatment as Usual**

Through the current treatment system, there is often a cycle of people attempting to quit alcohol several times before successfully achieving abstinence (Kelly et al., 2019). Among those who initiate an attempt of alcohol cessation, approximately half of those who relapse do so within the first month, either during or right after withdrawal (Dakota et al., 2019; Kelly et al., 2019; Manning et al., 2021). At least 58% of people entering treatment with one or more prior attempts tend to relapse, and more than half of those who complete treatment relapse within 90
days of discharge (Kelly et al., 2011; Manning et al., 2011). Still, among those with a diagnosed alcohol use disorder, little over seven percent receives treatment (NIH, 2021). This number does not include those who attempt alcohol cessation without treatment. The rates of those who attempt to quit alcohol without treatment is difficult to obtain, given the diversity of strategies people utilize for alcohol cessation and ambiguity of quitting drinking due to a disorder, health problems, or dependence. Provided the large percentage of relapses during or soon after alcohol withdrawal, and the severity and personal meaning often attributed to the experience, investigating factors that contribute to one’s ability to perceive through and beyond withdrawal is warranted.

Treatment for alcohol withdrawal has historically followed a biomedical model, with treatment as usual including referral to a detoxification program that is often separate from behavioral or psychological intervention (Blondell et al., 2011). Detoxification programs are optional resources, which allow someone to go through medically assisted withdrawal, typically with medication, which address one’s physical withdrawal symptoms (Blondell et al., 2011; Kattimani & Bharadwaj, 2013). Detoxification programs are not typically geared towards management of psychological symptoms such as depression and anxiety, regardless of their impact on clients (Blondell et al., 2011; Kattimani & Bharadwaj, 2013; Najera et al., 2019). For instance, detoxification programs that offer clinical services include optional group therapy or a brief session with a clinical professional (Blondell et al., 2011). Withdrawal has been seen by clients as the first step of the long road of recovery, so there is value in investigating what factors contribute to their completion of detox (Blondell et al., 2011; Najera et al., 2019). Herein lies evidence to suggest multiple failures on the part of the current mental health care system in the context of treatment for alcohol use disorders and alcohol withdrawal. Aforementioned recovery
statistics indicate shortcomings in the current standard and structure of care. Great difficulty is already associated with the decision to quit drinking, and the current state of the treatment system seems to intensify the adversity of recovery.

**Withdrawal Research**

Regardless of the staggering rates of alcohol use problems, and inadequate clinical attention towards symptoms of dependency, little research has addressed the potential impact of withdrawal on recovery. This sparked the qualitative investigation on the lived experience of alcohol withdrawal while undergoing an inpatient recovery program (Najera et al., 2019). Qualitative investigations imply that withdrawal is an impactful time for those recovering from alcohol use disorders, and Najera and others’ (2019) indicate personal meaning is drawn from the experience. Contrary to traditional treatment models of alcohol addiction, inpatient clients with AUD have described their withdrawal as an incredibly lonely experience during which they felt trapped within their minds (Najera et al., 2019). They also described withdrawal as a necessary transformation, one that they must draw meaning from in order to recover successfully. Similar to findings in Blondell et al. (2011), participants who initiated withdrawal through a detoxification program experienced little to no clinical service (Najera et al., 2019).

Additionally, clients have described their withdrawal experience as walking on a tightrope through Hell, being on a battleground, a boxing match with themselves with the gloves off, and clawing their way out of a dark pit with their hands (Najera et al., 2019). They explained that even though they had medical staff to provide medication and hospital treatment, they still felt alone and afraid (Najera et al., 2019). Furthermore, while some research begins to establish
the influence the experience of withdrawal can have on recovery as well as the value of capitalizing on such a pivotal time, there is still no knowledge on the specific contributing factors that differentiate between those who successfully complete and move on from withdrawal, and those who relapse (Blondell et al., 2011; Dakota et al., 2019; Kelly et al., 2019; Manning et al., 2021; Najera et al., 2019).

**Tobacco Withdrawal and Smoking Cessation as a Model**

While withdrawal research on the psychological aspects of alcohol withdrawal are sparse, other substances have received more empirical attention. Smoking cessation is a widely investigated scope of research. A systematic review and meta-analysis of changes in mental health after smoking cessation identified significant developments of anxiety, depression, and stress following cessation (Taylor et al., 2014). Whereas mental health improved significantly after cessation, participants from the various studies under review indicated a decrease of withdrawal symptoms and improved mental health. While improved mental health was found to be associated with smoking cessation, the authors acknowledge that there is no clear indication as to whether cessation led to improved mental health and reduction of withdrawal symptoms, or that mental health management or treatment yielded less withdrawal symptoms and more successful cessations (Taylor et al., 2014).

Withdrawal symptoms from nicotine include tingling, sweating, nausea, digestive problems, irritability and weight gain, to name a few, whereas alcohol withdrawal can include irritability, depressive or anxiolytic symptoms, severe flu like symptoms, high blood pressure, auditory and visual hallucinations, seizures, and even heart failure (Burke & Gotter, 2018; Hershon, 1977; Kattimani & Bharadwaj, 2013). Withdrawal intolerance, as well as dependence
on more than one type of tobacco substance has been associated with smoking during treatment or smoking within three months of treatment (Rohsenow et al., 2015). Withdrawal intolerance was measured using an Intolerance Smoking Abstinence Discomfort (IDQ-S) Scale and measured the levels of discomfort patients felt during treatment for smoking and their management of such discomfort (Rohsenow et al., 2015). Scores on the IDQ-S described one’s overall symptom intolerance, pain intolerance, and cognitive coping during withdrawal from nicotine (Sirota et al., 2011). High scores on the IDQ-S predicted higher likelihood of relapse, and sooner relapse after a voucher treatment program (Rohsenow et al., 2015). If intolerance of such symptoms is associated with relapse in those recovering from smoking, then there is reason to believe that one’s experience of alcohol plays an important role in recovery. While research has focused on the psychological impact of withdrawal from nicotine they are not as severe nor do they manifest in such a wide range of severity up to including death as those that can be experienced for alcohol.

The IDQ-S and Other Measures of Withdrawal

The IDQ-S as used by Sirota et al. (2011) contains factors which address multiple facets of the experience of withdrawal, such as symptom tolerance, pain tolerance, and cognitive coping. To reiterate, withdrawal is typically viewed and treated by medical and mental health professionals via a biological, pharmacological lens which places emphasis on the treatment of physical symptoms while often neglecting the psychological symptoms and clinical needs of clients (Blondell et al., 2011; Hayashida, 1998; NIH, 2021). The unique contribution of the IDQ-S is its inclusion of psychological and cognitive aspects of withdrawal, which sets it apart from similar existing assessments (Gossop et al., 2002; Mirijello et al., 2015; Rohsenow et al., 2015; Sirota et al., 2011; Williams et al., 2001).
Furthermore, to the best of my knowledge, the IDQ-S is one of the first of its kind that can be used as an anticipatory measure of one’s perceived resilience against the experience of withdrawal, whereas other existing scales assess one’s immediate symptomology (Gossop et al., 2002; Mirijello et al., 2015; Rohsenow et al., 2015; Sirota et al., 2011; Williams et al., 2001). For instance, common scales such as the Total Severity Assessment Scale (TSA) and the Clinical Institute Withdrawal Assessment (CIWA) are those which assess current withdrawal symptoms and their severity to facilitate patient navigation towards varying levels of care (Williams et al., 2001). Moreover, even recent efforts to develop efficient and shortened measures of alcohol withdrawal do not encompass the entire experience of withdrawal despite including items referring to psychological symptoms such as anxiety in confusion (Gossop et al., 2002; Williams et al., 2001). For example, the Short Alcohol Withdrawal Scale was developed to facilitate the evaluation and treatment of alcohol withdrawal syndrome (Gossop et al., 2002). While the intention of this scale as well as other traditional alcohol withdrawal assessments is apparently to facilitate treatment, they all fall short in terms of capturing all psychological experiences, if at all, as well as inconsistently account for all possible symptoms (Gossop et al., 2002; Mirijello et al., 2015; Williams et al., 2001).

The current study utilized the IDQ-S as a starting point for thoroughly accounting for experiences relevant to the experience of alcohol withdrawal, making up for shortcomings in current assessments (Gossop et al., 2002; Mirijello et al., 2015; Williams et al., 2001). In fact, the cognitive coping sub-scale alone seems to be the first of its kind to conceptualize what clients perceive as a necessary mindset in order to persevere through withdrawal (Najera et al., 2019). Clients have reported that being able to recognize the temporary nature of their symptoms and look forward to feeling better as time passes plays an important role in their recovery.
(Najera et al., 2019). To the best of knowledge such a concept has yet to be quantified, especially in the context of alcohol withdrawal.

Adapting the IDQ-S towards alcohol withdrawal (create the IDQ-A) is a valuable, if not essential, contribution to alcohol research as it will be a first step in treating alcohol withdrawal comprehensively as well as proactively. The IDQ-A as designed in the current study, included items which refer to one’s perceived ability to tolerate physical and psychological symptoms, encompass the ambiguity of withdrawal experiences often reported by clients, as well as measure one’s ability to think beyond withdrawal and progress through recovery (Sirota et al., 2011; Najera et al., 2019). Furthermore, given the unique language of the measure, the IDQ-A could be administered before one begins withdrawal, unlike other measures which rely on only measuring symptoms as they are happening (Gossop et al., 2002; Mirijello et al., 2015; Rohsenow et al., 2015; Sirota et al., 2011; Williams et al., 2001). This increases its clinical utility as it can aid alcohol withdrawal treatment, inform mental health and medical professionals about their client’s needs, and help to indicate clients’ risk of relapse (Sirota et al., 2011). Before this tool could be utilized in clinical settings, however, it needed to be psychometrically validated.

The Present Study

The specific objective of the current study was to validate an adapted withdrawal discomfort intolerance scale for alcohol (IDQ-A). Furthermore, aimed to establish construct, concurrent, discriminant, and predictive validity of the IDQ-A measure. The psychometric validation of the IDQ-A served as part of the fulfillment of milestones towards a master’s degree in Clinical Psychology. The long-term goal beyond validating the IDQ-A was to contribute to the development of an intervention designed to maximize one’s ability to initiate, overcome, and
surpass alcohol withdrawal to move on to next steps in recovery. Such contributions could benefit the current treatment system for alcohol addiction. However, the current literature does not provide clear targets for such an intervention. The validated IDQ-A indicates which aspects of withdrawal influence recovery the most, contributing to the efficacy of future interventions aimed at bolstering early outcomes from quitting drinking or initiating treatment from alcohol dependence.

**Construct, Concurrent and Discriminant Validity**

A first step for accomplishing validation for the IDQ-A was to confirm the three-factor model previously found for the IDQ-S in the previous smoking cessation study, and possibly determine other factorial arrangements via exploratory factor analyses (Sirot et al., 2011). This served as support for construct validity. Another step was to relate the IDQ-A and other valid measures. For instance, if one was to score high on the IDQ-A, then that same person should score specific ways on other specific scales. If one scores high on the IDQ-A, then that means they have low tolerance for difficult experiences. Therefore, to establish concurrent validity, I hypothesized that withdrawal intolerance would positively correlate with scores from a general discomfort intolerance scale, anxiety and depression symptoms. I also predicted that scores from the IDQ-A would be negatively correlated with scores from a measure of motivation to quit and a brief resiliency scale. However, I predicted that the cognitive coping subscale would positively relate to motivation to quit and resilience. Furthermore, I hypothesized that higher alcohol dependence and fewer attempts to quit would be associated with higher scores on the withdrawal intolerance and pain intolerance subscales, as well as the overall IDQ-A score. To replicate Sirot and others (2010), age and education were used for establishing discriminant validity.
Predictive Validity

The second component of the current thesis project was to attempt to establish predictive validity of the IDQ-A. Predictive validity would support the clinical application of the model supported by construct validity. Given IDQ-A scores would directly relate to meaningful outcomes, then risk factors associated with such outcomes can be targeted in future interventions for leveraging the period of withdrawal. Utilizing follow-up data collected one month after participants completed their baseline survey, drinking, resilience, discomfort tolerance, and withdrawal intolerance outcomes were related to IDQ-A scores from the previous time point. This replicates what Sirota and others (2011) performed when they found that high IDQ-S scores predicted higher rates of smoking after treatment. Given that the IDQ-A measures one’s inability to withstand withdrawal, I hypothesized that lower scores on the IDQ-A would be associated with higher rates of abstinence at one-month follow-up, fewer drinks per drinking occasion, and lower frequencies of drinking. I also predicted that lower IDQ-A scores would be associated with higher rates of completion of alcohol detoxification. Furthermore, I predicted that high IDQ-A scores at baseline would be associated with lower scores of resilience at follow-up, as well as lower discomfort tolerance. Finally, I hypothesized that IDQ-A scores from baseline would not differ significantly from those at follow-up, as stable scores along with the other predicted outcomes would strengthen the value of future interventions meant to bolster tolerance for withdrawal symptoms.

The present study aimed to fill key gaps in alcohol treatment literature. An adapted intolerance discomfort questionnaire (IDQ) for alcohol withdrawal can increase the efficacy of treatment, as it will allow programs to target risk factors associated with detox dropout and relapse (Rohsenow et al., 2015). Hence, there is value in investigating the psychometric
properties of an adapted withdrawal intolerance scale for alcohol, as well as establishing predictive validity in terms of recovery outcomes. Clinical settings can make use of such predictive power and the mechanisms of addictive behaviors in terms of alcohol use can be further investigated. Should the IDQ-A be implemented in standard care within detoxification programs and other settings that treat alcohol withdrawal, mental health professionals could presumably assess which incoming clients are most at risk for relapse and apply resources and clinical services accordingly. Such knowledge can help reduce the overwhelming relapse rates that happen early in the recovery process (Dakota et al., 2019; Kelly et al., 2019; Manning et al., 2021).

Chapter 2: Methods and Procedures

Participants

The current study focused on those who have an indication of dependence on alcohol, a critical symptom of alcohol use disorder. Participants who meet inclusion criteria for alcohol dependence and high motivation to quit were asked for informed consent to take the survey. Those high in alcohol dependence (both psychological and physical) would experience withdrawal symptoms should they quit drinking. High motivation to quit drinking served as an indication of one’s intentions to begin recovery and therefore initiate withdrawal. Participants were recruited in this manner to aid the validation of the IDQ-A by providing variability in alcohol dependence severity. Provided that participants presented with mild to severe alcohol dependence and high motivation to quit, their likelihood of both initiating recovery from alcohol misuse as well as experiencing withdrawal would increase and be ideal of the sake of the goals of the current study. Targeting a sample in a similar method as Sirota and others (2011), those who were enrolled in a treatment program for smoking cessation, would not provide this
variability, as all the participants going into a structured detoxification program are high in alcohol dependence and varied motivation to quit drinking. We also postulated that it would be difficult to separate the effects of participants’ programs on their recovery outcomes, rather than assess solely assess the effects of their withdrawal intolerance on said outcomes.

Furthermore, we recruited via Reddit, a social media platform. I broadcasted a brief description of the current study by posting an ad with the study link within groups focused on alcohol use and recovery. The groups were chosen as they would likely contain those who were thinking of quitting drinking. As for Reddit, the following have been chosen: /r/stopdrinking: a support group in your pocket!, The sub for drinks, drinking and drunks, Dry Alcoholics, To alcohol, the cause of and solution to all life's problems, and Because you're drunk -- and so am I. The study ad was also shared within default subreddits one is required to choose upon creating a Reddit account. The subreddits one joins upon creating an account are chosen based on subjects or “niches” of interests from a premade list. Creating a Reddit account as the Latino Alcohol Health Disparities Research Center (LAHDR), subreddits such as health and wellness” “positive change,” and similar subjects revolving around health behaviors were chosen.

Those who expressed interest in the study via social media were prompted with a digital informed consent form as well as two screening questionnaires, (SADQ-C and the Stages of Change Ladder Questionnaire). If they met criteria for moderate (score of 16 to 30) or severe (score of 31 and over) alcohol dependence (SADQ-C), expressed high motivation (score of 6 or above) to quit drinking (The Stages of Change Ladder) and clicked the option, which indicates consent, to participate, they were rerouted to the study survey. High SADQ-C scores indicated alcohol dependence, which would in turn increase the likelihood and severity of one’s withdrawal symptoms if they were to initiate abstinence. High motivation to quit ensured
participants had a baseline desire to change their drinking and allowed us to examine one’s motivation to quit and how it relates to their withdrawal intolerance at the beginning stages of recovery. Apart from including those who scored high on motivation to quit and high on alcohol dependence, inclusion criteria were those who report dependence to only alcohol, as opposed to multiple substances.

Those excluded from the study were those with multiple substance addictions (tobacco use was permitted as clients are typically allowed cigarettes during recovery) and those who had disabilities or conditions that might have inhibited their ability to understand and answer the questions in the survey. We screened for exclusion points by via the informed consent for, a Yes/No question such as, “Are you 18 years of age or older?” and, “Not including alcohol or tobacco, do you use or struggle with dependence on other substances?” The informed consent form helped to screen for one’s inability to comprehend the survey, as the consent option at the bottom asked if participants understood and gave consent to participate in the study.

Over 600 people attempted to take the survey, however nearly 400 appeared to meet the inclusion criteria. From that sample, fraud and bot detectors were employed to exclude those who attempted to retake the survey multiple times, as well as fraudulent responses. Qualtrics survey security calculators along with participant contact information were employed and to prevent respondents from taking the survey multiple times, utilizing bots or other means to submit multiple surveys, and protect compensation from being collected dishonestly. For instance, some embedded data within the survey security calculators would score responses, and if a certain score was met, participants were flagged as fraudulent or using bots. Participants who shared the same mobile number or email were also excluded. Participants were also excluded using the time taken to complete the baseline survey among volunteers from the LAHDR
research team. Using the fastest (nearly 20 minutes) and slowest (nearly 40 minutes) survey times as cut-off points, the final survey sample included 188 participants. Figure 1 depicts the overall exclusion process. Of those 188 participants, 91 participants completed the follow-up survey, demonstrating a 48.40% retention rate. Table 1 demonstrates the demographic profile of the baseline and follow-up samples. Additionally, participants were asked about which avenue they chose to make changes in their drinking during their one-month follow-up survey. Among those who completed the follow-up questionnaire, the majority attempted to make changes on their own without formal treatment (57%), whereas 19.10% reported attending group therapy such as Alcoholics Anonymous meetings, 11.20% enrolled in inpatient treatment programs, 10.10% attended outpatient treatment, and 2.20% reported not making any changes between baseline and follow-up.

When considering those who did not follow-up one month after completing their baseline survey, we completed comparative tests to assess chances of bias within our sample. We compared mean scores of the 97 participants who did not follow up with the 91 participants who completed their follow-up survey across all demographic variables as well as those within our models for convergent and predictive validity. Those who completed their follow-up survey did not differ statistically from those did not complete their follow-up survey across all demographics except highest education achieved; $F (1, 184) = 13.75, p < .01$. Those who completed their follow-up survey acquired higher levels of education ($M = 4.50, SD = 1.30$) as opposed to those who did not ($M = 3.76, SD = 1.44$). Additionally, comparing those who completed follow-up as opposed to those who did not, there were no group differences across the other variables of interest within the study. However, there were group differences in overall
IDQ-A scores ($F[1, 86] = 7.64, p < .05$) as well as in cognitive coping scores ($F[1, 86] = 7.62, p < .05$). There was no significant difference in withdrawal intolerance subscale scores. Those who followed-up scored higher on their cognitive coping subscale ($M = 2.60, SD = .45$) as well as on their overall IDQ-A score ($M = 3.26, SD = .43$) as opposed to those who did not follow up; $M = 2.38, SD = .63; M = 3.06, SD = .58$. 
Enrollment
Initial attempts of survey ($n = 627$)

Screening
Assessed for eligibility ($n = 401$).

Fraudulent Responses
Employment of Qualtrics bot detection, fraudulent scoring, and duplicate response detection. Researcher assessment of emails and phone numbers ($n = 205$).

Data Cleaning and Outliers
Removed outliers in data using slowest and fastest survey time among research lab volunteers as cut off points ($n = 188$)

Table 1
### Demographic Characteristics of Study Results

<table>
<thead>
<tr>
<th>Demographic</th>
<th>Baseline (N = 188)</th>
<th>Follow-up (N = 91)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Age</strong> Mean (SD)</td>
<td>33.40 (6.96)</td>
<td>31.51 (5.62)</td>
</tr>
<tr>
<td><strong>Relationship Status</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>11.80%</td>
<td>16.90%</td>
</tr>
<tr>
<td>Married</td>
<td>74.90%</td>
<td>59.60%</td>
</tr>
<tr>
<td>Separated</td>
<td>2.70%</td>
<td>4.50%</td>
</tr>
<tr>
<td>Divorced</td>
<td>5.30%</td>
<td>7.90%</td>
</tr>
<tr>
<td>Widowed</td>
<td>1.10%</td>
<td>2.20%</td>
</tr>
<tr>
<td>Unmarried Relationship</td>
<td>3.20%</td>
<td>6.70%</td>
</tr>
<tr>
<td>Other</td>
<td>1.10%</td>
<td>2.20%</td>
</tr>
<tr>
<td><strong>Household Income</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than $25,000</td>
<td>3.70%</td>
<td>6.70%</td>
</tr>
<tr>
<td>$25,000-$49,999</td>
<td>12.80%</td>
<td>18.00%</td>
</tr>
<tr>
<td>$50,000-$74,999</td>
<td>33.20%</td>
<td>24.70%</td>
</tr>
<tr>
<td>$75,000-$99,999</td>
<td>26.70%</td>
<td>18.00%</td>
</tr>
<tr>
<td>$100,000-$149,999</td>
<td>55.80%</td>
<td>13.50%</td>
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<tr>
<td>$150,000 or more</td>
<td>9.60%</td>
<td>14.60%</td>
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<tr>
<td>Prefer not to say</td>
<td>2.10%</td>
<td>4.50%</td>
</tr>
<tr>
<td><strong>Assigned Sex at Birth</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>32.10%</td>
<td>34.80%</td>
</tr>
<tr>
<td>Male</td>
<td>65.20%</td>
<td>59.60%</td>
</tr>
<tr>
<td>Other</td>
<td>2.70%</td>
<td>5.60%</td>
</tr>
<tr>
<td><strong>Ethnic Identity</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Non-Hispanic White or Euro American</td>
<td>84.60%</td>
<td>74.40%</td>
</tr>
<tr>
<td>Black, Afro-Caribbean, or African American</td>
<td>4.80%</td>
<td>4.40%</td>
</tr>
<tr>
<td>Latino or Hispanic American</td>
<td>47.00%</td>
<td>45.30%</td>
</tr>
<tr>
<td>Asian</td>
<td>0.50%</td>
<td>1.10%</td>
</tr>
</tbody>
</table>
Native American or Alaskan Native 1.10% 1.10%

**Highest Education Achieved**

<table>
<thead>
<tr>
<th>Education Level</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Some high school or less</td>
<td>2.20%</td>
</tr>
<tr>
<td>High school diploma or GED</td>
<td>12.40%</td>
</tr>
<tr>
<td>Some college, but no degree</td>
<td>22.60%</td>
</tr>
<tr>
<td>Associates or technical degree</td>
<td>14.50%</td>
</tr>
<tr>
<td>Bachelor’s Degree</td>
<td>30.60%</td>
</tr>
<tr>
<td>Graduate or professional degree</td>
<td>16.10%</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>1.60%</td>
</tr>
</tbody>
</table>

Note. Latino or Hispanic Americans can also identify as other racial/ethnic groups, which explains why ethnic identity options add up to more than 100%.

**Designing the IDQ-A**

The IDQ-A was adapted from Sirota and others’ (2011) IDQ-S for measuring intolerance of smoking cessation withdrawal symptoms. Questions relate to three subscales that measure withdrawal symptoms intolerance, pain intolerance, and cognitive coping. First, all items changed any references from smoking and cigarettes to drinking. Next, similar to Sirota et al. (2011), those in the Latino Alcohol Health Disparities Research and Training Center (LAHDR) decided on whether items from the IDQ-S could also be applied to alcohol, and whether items needed to be withdrawn or added in order to encapsulate symptoms and experiences relevant to alcohol withdrawal. No items were removed from the original IDQ-S scale, however items were added in order to pertain to all alcohol withdrawal symptoms and experiences. We added five items to the withdrawal symptom intolerance subscale, four to the cognitive coping subscale, and three to the pain intolerance subscale. Additions were based on the spectrum of alcohol
withdrawal symptoms as listed in the DSM-V, as well as previous qualitative research on the experience, while also stressing the length of the overall measure (APA, 2013; Najera et al., 2019). For instance, severe flu-like symptoms and nausea are common alcohol withdrawal symptoms, so we added, “I can’t tolerate feeling nauseas for more than a day” to the IDQ-S adaptation for alcohol withdrawal (APA, 2013). To avoid a long questionnaire and attention fatigue, conciseness was prioritized.

**Measures Used**

*Demographics and Screeners*

This was a measure administered to help describe the sample collected during the study. Questions determined age, sex assigned at birth, gender identity, race/ethnic identity, marital status, level of education attainment, employment status, household income, and religious affiliation. The question asking for age was a fill in the blank question, while the rest were multiple choice style questions. We ensured that answer choices were relevant and followed current best practices for accuracy and inclusion. There was also the option of “prefer not to answer” for every question in case participants felt uncomfortable answering such questions. For the purpose of the current study, only age and education were used for discriminant validity used in analyses. The other demographic information was collected for future secondary analyses should they be deemed possible and necessary.

Alcohol dependence was the first screener used to ascertain inclusion criteria. The SADQ-C is a variation of the original SADQ which is meant for administration among community samples (Stockwell et al., 1994). This version is ideal for the target population, as some participants will vary on their level of dependance and qualifications for an alcohol use
disorder. It measures the extent of physical and psychological dependence using 4 point Likert-style questions organized under the following subscales: physical withdrawal symptoms, affective withdrawal symptoms, relief drinking, frequency of alcohol consumption, and speed of onset of withdrawal symptoms (Stockwell et al., 1994). Creators claim it to be a quick, reliable, and valid measure, with a Cronbach's Alpha of 0.98 (Stockwell et al., 1994).

Motivation to quit was the second screener used to ensure participants met inclusion criteria. The Ladder of Change is an interactive measure that was developed using the image of a ladder to depict one’s perceived stage of wanting to change their substance use, including drinking alcohol (Hogue et al., 2010). A visual ladder is presented to participants with numbers along the steps (0 – 10). Each step is aligned statements ranging from “No thoughts of quitting,” to “I am taking action to quit.” Participants choose the answer that best fits their current “stage of change.” The ladder of change has been used for alcohol as well as drug use, and has been extensively psychometrically tested (Hogue et al., 2010). For instance, convergent, concurrent, discriminant and predictive validity have been established for the measure (Hogue et al., 2010).

Convergent Validity

Discomfort Intolerance, anxiety, depression, resilience, and previous attempts to quit were used to assess convergent validity. While alcohol dependence and motivation to quit were measured in the screening portion of the survey, the following questionnaires served as measures to aid in the assessment of our remaining convergent validity hypotheses.

The Discomfort Intolerance scale (DIS) is a measure is a brief evaluation of one’s perceived ability to tolerate physical discomfort including pain (Schmidt et al., 2006).
Participants rate the questions on a scale ranging from 0 (not at all like me) to 6 (extremely like me). An example of an item is, “I take extreme measures to avoid feeling physically uncomfortable.” The DIS has been validated as having two distinct factors, one which measures the ability to tolerate discomfort and pain ($\alpha = .91$), and the other which measures avoidance of physical discomfort ($\alpha = .72$; Schmidt et al., 2006). Furthermore, criterion and construct validity for the DIS has been established, and its items appear to converge with symptoms of anxiety more so than depression, which is consistent with the original intent of the measure to assess tolerance to panic disorder symptoms (Schmidt et al., 2006). The DIS will be used for concurrent validity.

The Hospital Anxiety and Depression Scale-Anxiety (HADS) is a brief measure of generalized symptoms of depression and anxiety (Snaith, 2003; Zigmond & Snaith, 1983). It consists of 14 Likert items ranging from 0 to 4. It has been used to detect and quantify the magnitude of anxiety symptoms. Sample items include: “I can sit still and feel relaxed,” 0 being definitely to 4 for not at all; and “I have lost interest in my appearance,” with 0 being not at all to 4 for very much indeed. It measures depressive and anxiety symptoms; however, it is not a diagnostic tool (Julian, 2011). Cronbach’s alpha for both the anxiety and depression subscale of the HADS are high on average, ranging from .68 to .93 and .67 to .90 respectively (Bjelland et al., 2002). Additionally, it has been validated as a screening and detection tool for depressive and anxiety symptoms across various populations, including clinical and general populations (Bjelland et al., 2002).

Resilience was measured by a Brief Resilience Scale (Smith et al., 2008). The measure consists of six items which ask about one’s perceived ability to recover from and persevere
through stressful life events (Smith et al., 2008). Sample items include: “I tend to bounce back quickly after hard times,” and “I usually come through difficult times with little trouble” (Smith et al., 2008). Participants answered each question from the Brief Resilience Scale via a five-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The Brief Resilience Scale has been validated and assessed for internal consistency among a variety of populations, and Cronbach’s alpha for the measure has ranged from .80 to .91 (Smith et al., 2008).

Finally, previous attempts to quit was assessed with one question asking how many times a person has attempted to quit alcohol. This was an open-ended question in which participants were instructed to place a number value.

Withdrawal Intolerance: IDQ-A

This is the measure we adapted to be relevant towards alcohol use, as it was originally designed for smoking withdrawal symptoms (Sirota et al., 2010). It had three subscales, (1) Withdrawal Intolerance (17 items), involving intolerance of affective, cognitive and physical symptoms commonly reported for withdrawal, (2) Cognitive Coping (9 items), reflecting various cognitive ways to cope with withdrawal, and (3) Pain Intolerance (6 items), reflecting tendencies to rapidly escape from physical pain (e.g., headache) often caused by withdrawal. An example of an item is, “I hate that anxious feeling I get when I haven't had a cigarette in a while.” Again, each item is a Likert style question which asks the participant to rate how much they agree to each statement. Answers range from 1 (strongly disagree) to 5 (strongly agree). See Tables 2, 3, and 4 for a depiction of each subscale and their designated items. Given that prospective participants past experience with attempting to quit drinking or withdrawal was expected to vary, we instructed participants with the following before answering our IDQ-A questions: “The
questions below refer to how much you might struggle with certain experiences. If you have never experienced something a question asks about, imagine what it might be like for you and answer to the best of your knowledge.”
<table>
<thead>
<tr>
<th>Withdrawal Intolerance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I hate that anxious feeling I get when I haven’t had a drink in a while.</td>
</tr>
<tr>
<td>2. I can’t tolerate being irritable from not drinking.</td>
</tr>
<tr>
<td>3. I cannot stand how I feel when I need a drink.</td>
</tr>
<tr>
<td>4. I hate it when my mind doesn’t feel sharp if I haven’t had a drink in a while.</td>
</tr>
<tr>
<td>5. I can’t stand that restless, jittery feeling I get if I go too long without a drink.</td>
</tr>
<tr>
<td>6. When trying to quit drinking, my desire for a drink is more than I can handle.</td>
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<tr>
<td>7. It really bothers me if I have trouble concentrating when I’ve gone without a drink for a while.</td>
</tr>
<tr>
<td>8. I can’t tolerate feeling dragged out or fatigued when I go without drinking.</td>
</tr>
<tr>
<td>9. I can’t stand how depressed I feel when I go too long without a drink.</td>
</tr>
<tr>
<td>10. Going through alcohol withdrawal is more stress than I can tolerate.</td>
</tr>
<tr>
<td>11. When I have an urge to drink, I have to do something about it.</td>
</tr>
<tr>
<td>12. I can’t stand the boredom that goes along with quitting alcohol.</td>
</tr>
<tr>
<td>13. I can’t tolerate feeling nauseas for more than a day.*</td>
</tr>
<tr>
<td>14. I can’t make it through what feels like the worst hangover I’ve had.*</td>
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<tr>
<td>15. I can’t stand the strange sensations I get when I go too long without drinking.*</td>
</tr>
<tr>
<td>16. I hate the feeling of guilt that comes when I haven’t had a drink in a while.*</td>
</tr>
<tr>
<td>17. My emotions are too much to handle when I’ve gone too log without a drink.*</td>
</tr>
</tbody>
</table>
Table

Note. *Items added to each subscale rather than reworded to pertain to alcohol.

3

Cognitive Coping Items

1. I just have to tolerate how I feel in order to quit drinking.

2. The pain I experience when quitting drinking won’t go away right away, but I just have to wait it through.

3. I will feel irritable when quitting drinking, but it will be temporary, and I can deal with it.

4. It’s OK if I have to feel lousy for a while in order to quit drinking.

5. To get through a day without a drink, I think to myself, “no pain, no gain.”

6. I will be a new person after withdrawal.*

7. Going through withdrawal is worth the rewards afterwards.*

8. I don’t know enough about withdrawal to go through it.*

9. Withdrawal seems/is too scary to go through.*

Note. *Items added to each subscale rather than reworded to pertain to alcohol.
4 Pain

Intolerance

1. When I get a headache from quitting drinking, I have to take something for the pain as soon as possible.

2. I use aspirin, Tylenol, Advil, or *other pain killing medicines* whenever I have aches or pains from alcohol withdrawal.

3. When I have a bad headache from quitting alcohol, I have to lie down or go to a quiet place.

4. Nothing I try seems to help with physical pain when I haven’t had a drink in too long.*

5. I always need pain killers for achy joints or muscle soreness.*

6. Nothing I try seems to help with emotional pain when I haven’t had a drink in too long.*

*Note. *Items added to each subscale rather than reworded to pertain to alcohol.
Table

<p>| | | |</p>
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Predictive Validity

To establish predictive validity, the measures used for convergent validity in the baseline survey were also used in the follow-up survey to investigate predictive validity of the IDQ-A, per the hypotheses of the current study. However, in addition to relating baseline IDQ-A scores to those aforementioned measures at one-month follow-up, additional outcomes were investigated. For one, participants were also asked about their drinking behaviors during the one-month follow-up period. Each question asked about their number of drinking occasions since the previous survey and the number of drinks per drinking occasion. This set of questions ascertained abstinence, with 0 drinks, and 0 drinking occasions since the previous survey being indicative of abstinence.

Completion of alcohol detoxification was also assessed via a multiple-choice question of whether clients completed treatment for alcohol withdrawal. Options for this item were yes, no, does not apply to me, or I am still in/seeking treatment. Statistically, this item was treated as binary, with all those who answered “yes” being counted as completing detox, while those who chose any of the other options were counted as not completing detox.

Survey Procedures

First, the adapted withdrawal intolerance scale for alcohol was administered along with other questionnaires that were expected to conceptually relate to withdrawal intolerance scores, per the hypotheses. The survey was also delivered in non-technical, elementary level English. After completion of this initial survey, participants were compensated $5.00 virtual gift cards via Rewards Genius Tango cards. Construct, convergent, and discriminant validity of the measure were assessed by determining relationships between the adapted withdrawal intolerance
subscales and the subsequent questionnaires. Correlations between the adapted withdrawal intolerance subscales, overall scores, and scores from the subsequent questionnaires were used to validate the adapted measure. The analyses also provided tests of good fit.

After initial completion of the survey, participants were then contacted via a valid email address and text message on their mobile phone number one month after their baseline completion. Additional reminders were sent weekly for three weeks after the first reminder. If participants failed to take the follow-up survey one week after the final email and text reminder, they were considered dropped out and their contact information was discarded (deleted). Given the high percentage of relapses within the first month of quitting based on previous research, this follow-up period allowed us to assess how much is attributed to alcohol withdrawal intolerance (Dakota et al., 2019; Kelly et al., 2019; Manning et al., 2021). The follow-up questionnaire resembled the original, minus the demographic questions. It also included questions which would track one’s alcohol use within the past month. Attention checks and counterbalancing between each measure in the questionnaires were utilized to account for attention fatigue and other participant related confounds and bias. Once again, participants were compensated, this time via a gift card valued at $10.00 for a vendor that does not allow transactions for alcoholic products. They were also entered in a raffle for a chance to win a $500 gift card. The scores from the one-month time point were used to establish predictive validity by relating them to baseline scores.

**Statistical Analyses**

The withdrawal intolerance scale has three subscales, therefore I initially tested a threefactor model via a confirmatory factor analysis, and assessed goodness of fit. We assessed
several major computations from the statistical software which provide indices of good fit such as the root mean square error of approximation. (RMSEA), comparative fit indices (CFI), and standardized root mean error residual (SRMR).

Higher CFI indicates better fit between the data and the hypothesized three-factor model (MacCallum et al., 1996). Lower RMSEA and SRMR indicate better fit as they measure error between the data and hypothesized model (MacCallum et al., 1996). The level of good fit as indicated from these calculations were determined using criteria established by MacCallum and others (1996). Thresholds of good fit were taken from (MacCallum et al., 1996) which indicates that CFI must be equal to or exceed .95, RMSEA must reach or be lower than .06, and SRMR must be equal to or less than.08. I also tested the fit of the three-factor model against a one factor model. Exploratory factor analyses (EFA’s) were utilized to assess other possible factor loadings and item groupings. The most parsimonious model in terms of change in CFI and RMSEA was determined which best fits the data (MacCallum et al., 1996). The models which created a change in CFI greater than or equal to .01 and change in RMSEA greater than or equal to .015 in the desired direction of fit were deemed the more parsimonious model which fits the data best (MacCallum et al., 1996).

To assess better fitting models and items to factor configurations, EFA’s were employed to test geomin rotated factor loadings (an oblique type of rotation to allow factors to correlate with each other) on various factor models. Güvendir and Özkan (2022) recommend several procedures to address instances of cross-loadings (items significantly loading onto more than one factor), as well as poorly loading items (items that do not significantly load onto any factors in one’s measure). Furthermore, they outline item reduction procedures that one can employ in addition to investigating how items load onto factors at face value after performing an EFA.
For the current study, we employed Güvendir and Özkan (2022) strategy which is meant to retain reliability in terms of both Chronbach’s alpha and McDonald’s omega. Specifically, the item reduction procedure entailed removing items from the analyses and retesting the EFA each time. Furthermore, poorly loaded items were recommended to be removed first, followed by significantly cross-loaded items (Güvendir & Özkan, 2022). This would ensure that each factor resulting from the EFA would be distinct, items that were redundant or did not coincide with the measure would be discarded, and the items remaining in the model would contribute to a better fitting model (Güvendir & Özkan, 2022).

Factor loadings for each item were collected to compute McDonald’s alpha coefficient to determine the reliability of each factor (McDonald, 1999). Inter-factor correlations were computed as well as correlations between each factor and the additional scales in the survey (brief question on past attempts to quit, HADS, brief resiliency scale, and the generic Discomfort Intolerance Scale). These correlations, as well as regression analyses between IDQ-A results and scores from the additional measures, were used for convergent and discriminant validity. To establish predictive validity, follow-up scores of drinking behavior, detoxification completion, and follow-up IDQ-A scores were regressed on the IDQ-A scores collected during baseline. All regression analyses in part of convergent, discriminant, and predictive validity were simple linear regression analyses, regressing the respective aforementioned constructs onto baseline IDQ-A scores per the hypothesize relationships.

**Power Analyses**

Power and the required sample size for the current project were estimated using Monte Carlo simulations of the three-factor CFA analyses (Mooney, 1997). To test the three-factor
model of the IDQ-A with 32 items, with each factor variance set to one, and estimated loadings being at least .70 and inter-factor correlations being at least .30. 150 participants at minimum was required. Utilizing recommendations by Muthen and Muthen (2002), 10,000 simulations with 150 observations in MPlus demonstrated that parameter estimates, and standard error biases were less than 5%, and coverage for each inter-factor relationship ranged between .93 and .94. Furthermore, power was estimated to be approximately .91. A smaller sample size could have been utilized to minimize the risk of making a Type I error when obtaining results, however a smaller sample to test the validity of a 32-item measure is not ideal.

Observed power of the psychometric tests performed using the EFA supported two-factor model indicate sufficient power. Considering a preset alpha level to .05, a new 18-item measure as opposed to 32 items ($df = 135$), and our final sample size of 188 participants, null and alternative RMSEA power computations demonstrated that the current project was powered at .91 (MacCullum et al., 1996; Preacher & Coffman, 2006). Considering that the a priori power analyses conservatively suggested a minimum sample size of 150 participants for sufficient power when testing a three-factor, 32-item measure, a reduced factor and item measure with a larger sample size than previously suggested is likely to retain ample statistical power. Post-hoc power analyses for the predictive validity procedures (correlational and linear regression tests) using an $N$ of 91 also indicate satisfactory statistical power at .89 (Erdfelder et al., 1996).

Chapter 3: Results

Construct Validity

Three factors were hypothesized, and a confirmatory factor analysis (CFA) of the that model demonstrated mixed results in terms of model fit to the items in the data set: $SB\chi^2(461, N$
Provided standards of good fit, the only index of fit that met criteria in this three-factor model was RMSEA meeting .06, however it’s 95% confidence interval exceeds that threshold. Comparative fit indices was less than .9, and SRMR exceeded .08 (McCallum et al., 1996). Overall, the proposed three factor model did not demonstrate good fit.

Another possible configuration of the full IDQ-A was a test of one, single common factor. CFA results of a single common factor model of the IDQ-A demonstrated what appeared to be a model that fit the data set even less than the original three factor design: SB $\chi^2 (464, N = 188) = 1024.53, p = .00, \text{RMSEA} = .08 (90\% \text{ CI}, .08 - .09), \text{CFI} = .65, \text{and SRMR} = .11$. None of the fit indices met criteria for good fit (MaCallum et al., 1996). When comparing the two tested models (three factor as opposed to one factor), the three-factor model appears to be the more parsimonious model given $\Delta \text{CFI} > .01$ and $\Delta \text{RMSEA} > .015$ changes from the single factor model to the three factor model (MacCallum et al., 1996). Still, provided its relatively poor fit, the original proposed model of three factors needed to be compared to other possible models that would fit and explain the data more parsimoniously.

To assess better fitting models and items to factor configurations, EFA’s were employed to test rotated factor loadings on various factor models. In terms of model fit, an EFA of the IDQA supported up to a five-factor model. This five-factor model demonstrated better fit than the original three factor model: SB $\chi^2 (496, N = 188) = 2748.55, p = .00, \text{RMSEA} = .06 (90\% \text{ CI}, .05 - .07), \text{CFI} = .91, \text{and SRMR} = .04$, however that model demonstrated several significant crossloadings of items between factors, as well as items that did not load onto any factors, which suggested a need for item reduction (Güvendir & Özkan, 2022).
From the five-factor model, poorly loaded items which did not significantly load onto any factors at the .05 alpha level as well as the most cross-loaded items were removed followed by retests of the model each time, according to guidelines from Güvendir and Özkan (2022) as to preserve reliability. Item language and rotated loadings were also assessed after each test to determine whether certain items contained redundancy or non-specific descriptions of withdrawal symptoms. This led to the support of a two-factor model without the pain intolerance subscale entirely and some withdrawal intolerance subscale questions. Table 5 illustrates the factor loadings of the final two-factor model. Additionally, items two and items 9 in the reduced two-factor model were originally designed to be in the cognitive coping subscale, yet they loaded onto the withdrawal intolerance subscale. This could be because the other cognitive coping questions are framed positively, such as referring to “becoming a new person,” or “rewards afterwards,” whereas the cognitive coping items that loaded onto the withdrawal intolerance items refer to “not knowing enough about withdrawal” or withdrawal being “too scary.” Because of their wording, these items were reversed coded during scoring, however they are still missing components that the other cognitive coping items appear to possess: a reference to what will happen after withdrawal. This could explain this unexpected pattern of item loadings.
Table 5

Factor Loadings of Two Factor IDQ-A

<table>
<thead>
<tr>
<th>Item</th>
<th>Withdrawal Cognitive</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Intolerance</td>
<td>Coping</td>
</tr>
<tr>
<td>1</td>
<td>When trying to quit drinking, my desire for a handle</td>
<td>.66 .07 drink is more than I can handle</td>
</tr>
<tr>
<td>2</td>
<td>Withdrawal seems/is too scary to go through.</td>
<td>.58 .08</td>
</tr>
<tr>
<td>3</td>
<td>Going through alcohol withdrawal is more stress than I can tolerate</td>
<td>.57</td>
</tr>
<tr>
<td>4</td>
<td>My emotions are too much to handle when I’ve gone too long without a drink.</td>
<td>.56 .08</td>
</tr>
<tr>
<td>5</td>
<td>I can’t stand the boredom that goes along with quitting alcohol.</td>
<td>.55 .08</td>
</tr>
<tr>
<td>6</td>
<td>I cannot stand how I feel when I need a drink.</td>
<td>.53 .08</td>
</tr>
<tr>
<td>7</td>
<td>I hate that anxious feeling I get when I haven’t had a drink in a while.</td>
<td>.52 .08</td>
</tr>
<tr>
<td>8</td>
<td>I can’t make it through what feels like the worst hangover I’ve had.</td>
<td>.52 .08</td>
</tr>
<tr>
<td>9</td>
<td>I don’t know enough about withdrawal to go through it.</td>
<td>.52 .08</td>
</tr>
<tr>
<td>10</td>
<td>I hate it when my mind doesn’t feel sharp if I haven’t had a drink in a while.</td>
<td>.50 .07</td>
</tr>
<tr>
<td>11</td>
<td>I hate the feeling of guilt that comes when I haven’t had a drink in a while.</td>
<td>.47 .09</td>
</tr>
</tbody>
</table>
12 It’s OK if I have to feel lousy for a while in order to quit drinking. 
13 I will feel irritable when quitting drinking, but temporary, and I can deal with it.
14 The pain I experience when quitting drinking away, but I just have to wait it through.
15 Going through withdrawal is worth the rewards afterwards.
16 To get through a day without a drink, I think to myself, “no pain, no gain.”
17 I just have to tolerate how I feel in order to quit drinking.
18 I will be a new person after withdrawal.

Note: This table demonstrates how each item loaded onto one of two factors after item reduction strategies were implemented on the originally proposed IDQ-A. All item loadings shown in this new model are significant at the .05 level, and there were no significant cross loadings when tested in the EFA. Nonsignificant loadings for each item on the factor they did not significantly load on ranged from |.00| to |.14|.

The two-factor model as displayed in Table 2 demonstrated overall good fit: $\text{SB } \chi^2 (134, N = 188) = 189.60, p = .01, \text{RMSEA} = .05 (90\% \text{ CI, } .03 - .06), \text{CFI} = .91, \text{and SRMR} = .07$. The interactor correlation was non-significant, $r = -.21, p = .11$. Furthermore, I calculated McDonald’s coefficient omega ($\omega$) to assess reliability using the following equation for each factor:

$$\omega = \frac{(\sum \lambda_j)^2}{(\sum \lambda_j)^2 + \sum \sigma^2_{ij}}$$

McDonald’s omega reliability coefficients for both factors were acceptable, as the first factor produced an omega coefficient of .82 and the second factor produced an omega coefficient of .83 (McDonald, 1999). Additionally, variance explained by each factor was calculated by
adding the squared loadings in each factor and dividing by the number of items. From these calculations, the withdrawal intolerance factor explained 29.82% of the variance in our data, while the second factor accounted for 41.43% of the variance. Altogether, the IDQ-A accounted for 71.25% of the variance in the collected data.

Given the new configuration of IDQ-A items, the two-factor model still needed to be assessed against a one-factor model. The one factor model of the reduced IDQ-A produced the following fit indices: SB $\chi^2 (135, N = 188) = 466.19, p = .00, \text{RMSEA} = .12$ (90% CI, .10 -.13), CFI = .47, and SRMR = .14. Provided standards of good fit, the one factor model demonstrates poor fit, and it is less parsimonious than the two-factor model of the reduced IDQ-A. Thus, the two-factor model of the IDQ-A with reduced items fits the data the most out of all models tested in the current project. Table 6 summarizes models checked and change in RMSEA and CFI between models.

Table 6

<table>
<thead>
<tr>
<th>Model Comparisons</th>
<th>CFI</th>
<th>RMSEA</th>
<th>SB $\chi^2$</th>
<th>SRMR</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>Three Factor Model</td>
<td>.80</td>
<td>.06</td>
<td>782.48</td>
<td>.12</td>
<td>461</td>
</tr>
<tr>
<td>One Factor Model</td>
<td>.65</td>
<td>.08</td>
<td>1024.53</td>
<td>.11</td>
<td>464</td>
</tr>
<tr>
<td>Five Factor Model</td>
<td>.91</td>
<td>.06</td>
<td>2748.55</td>
<td>.04</td>
<td>496</td>
</tr>
<tr>
<td>Two Factor Model: Reduced</td>
<td>.91</td>
<td>.05</td>
<td>189.60</td>
<td>.07</td>
<td>134</td>
</tr>
<tr>
<td>One Factor Model: Reduced</td>
<td>.47</td>
<td>.12</td>
<td>466.19</td>
<td>.14</td>
<td>135</td>
</tr>
</tbody>
</table>
Convergent & Discriminant Validity

Correlation and regression analyses were conducted to determine convergent and discriminant validity of the reduced IDQ-A. Scores of withdrawal intolerance were related to those of general discomfort intolerance, anxiety, depression, motivation to quit, resilience, previous attempts to quit drinking, and alcohol dependence. Simple linear regression analyses were conducted, each regressing each aforementioned construct onto IDQ-A scores. While the pain subscale was no longer available to be included in analyses, the two new subscales of the IDQ-A and their relationships to the aforementioned constructs were included. Table 7 provides the correlations coefficients collected between the IDQ-A score and constructs of interest, as well as those with the IDQ-A subscales. Additionally, Table 8 provides additional descriptive statistics of variables included in both baseline and follow-up surveys.
### Table 7

*Correlations of IDQ-A with Conceptually Related Measures*

<table>
<thead>
<tr>
<th>Variable</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
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<th>10</th>
<th>11</th>
<th>12</th>
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<tbody>
<tr>
<td>1. Withdrawal Intolerance</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2. Cognitive Coping</td>
<td>-.18</td>
<td>1</td>
<td></td>
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<td>3. IDQ-A</td>
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<td>.61**</td>
<td>1</td>
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<tr>
<td>4. Resilience</td>
<td>-.18</td>
<td>-.38*</td>
<td>-.44**</td>
<td>1</td>
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<td></td>
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<tr>
<td>5. Discomfort Tol.</td>
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<td>.21*</td>
<td>-.23*</td>
<td>-.23*</td>
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<td>6. Anxiety</td>
<td>.20</td>
<td>.18</td>
<td>-.32**</td>
<td>-.34**</td>
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<td>7. Depression</td>
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<td>.34**</td>
<td>.44**</td>
<td>-.44</td>
<td>.15</td>
<td>.47**</td>
<td>1</td>
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<td>8. Prev. Attempts to Quit</td>
<td>.01</td>
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<td>-.26*</td>
<td>.40**</td>
<td>.12</td>
<td>-.09</td>
<td>-.18</td>
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<td>9. Motivation to Quit</td>
<td>.17</td>
<td>-.07</td>
<td>.09</td>
<td>-.02</td>
<td>-.14</td>
<td>.33**</td>
<td>.15</td>
<td>.04</td>
<td>1</td>
<td></td>
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<tr>
<td>10. Dependence</td>
<td>.36**</td>
<td>.203</td>
<td>.44**</td>
<td>-.37**</td>
<td>.07</td>
<td>.22*</td>
<td>.42**</td>
<td>-.22</td>
<td>.28**</td>
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<td>11. Age</td>
<td>-.16</td>
<td>-.31**</td>
<td>-.35**</td>
<td>.16</td>
<td>.14</td>
<td>-.25*</td>
<td>.07</td>
<td>.18</td>
<td>-.01</td>
<td>-.12</td>
<td>1</td>
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<td>12. Education</td>
<td>-.23*</td>
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<td>.05</td>
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<td>.08</td>
<td>-.08</td>
<td>.25*</td>
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<td>13. Treat Comp</td>
<td>-.12</td>
<td>-.26*</td>
<td>-.28**</td>
<td>.187</td>
<td>-.39**</td>
<td>-.09</td>
<td>-.33**</td>
<td>.12</td>
<td>.09</td>
<td>-.28**</td>
<td>.02</td>
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### Table 8

**Descriptive Statistics of Study Variables**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Baseline</th>
<th>Min - Max</th>
<th>Follow-up</th>
<th>Min - Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol Dependence Mean (SD)</td>
<td>30.32 (8.74)</td>
<td>16 - 60</td>
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<td>--</td>
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<tr>
<td>Motivation to Quit Mean (SD)</td>
<td>8.04 (.98)</td>
<td>6 – 10</td>
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</tr>
<tr>
<td>Withdrawal Intolerance Mean (SD)</td>
<td>3.16 (.51)</td>
<td>1.54 - 5</td>
<td>3.47 (.56)</td>
<td>2.33 – 4.72</td>
</tr>
<tr>
<td>Resilience Mean (SD)</td>
<td>3.03 (.55)</td>
<td>1 - 5</td>
<td>3.12 (.68)</td>
<td>1.87 – 4.83</td>
</tr>
<tr>
<td>Discomfort Tolerance Mean (SD)</td>
<td>24.55 (3.43)</td>
<td>13 - 35</td>
<td>24.33 (3.29)</td>
<td>16 - 38</td>
</tr>
<tr>
<td>Anxiety Mean (SD)</td>
<td>10.16 (2.68)</td>
<td>3 - 21</td>
<td>--</td>
<td>--</td>
</tr>
<tr>
<td>Depression Mean (SD)</td>
<td>9.82 (2.76)</td>
<td>2 - 21</td>
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<td>--</td>
</tr>
<tr>
<td>Previous Attempts to Quit</td>
<td>5.77 (5.78)</td>
<td>0 - 40</td>
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<td>--</td>
</tr>
<tr>
<td>Completion of Alcohol Detoxification</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Yes</td>
<td>--</td>
<td></td>
<td>44.20%</td>
<td></td>
</tr>
<tr>
<td>No</td>
<td>--</td>
<td></td>
<td>55.80%</td>
<td></td>
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</table>

Regression analyses were also conducted to assess the proposed baseline relationships. Table 9 provides $R^2$ and $F$ tests associated with each reported regression result. Furthermore, the IDQ-A significantly regressed onto baseline discomfort tolerance: $\beta = 1.97, S.E. = .79, t (88) = 2.49, p = .02$. Anxiety demonstrated a positive relationship with IDQ-A scores as well: $\beta = 2.12, S.E. = .67, t (88) = 3.12, p = .00$. Similarly, depression symptoms positively associated with withdrawal intolerance: $\beta = 2.97, S.E. = .65, t (88) = 4.60, p = .00$. In terms of motivation to quit and resilience, mixed results were produced in terms of what was originally hypothesized as motivation to quit was not associated with withdrawal intolerance ($\beta = .21, S.E. = .25, t (88) = .85, p = .40$), and resilience negatively associated with withdrawal intolerance ($\beta = -.507, S.E. = \ldots$)
Additionally, alcohol dependence was positively associated with IDQ-A scores: $\beta = 8.93, S.E. = 1.92, t(88) = 4.65, p = .00$. However, previous attempts to quit were negatively associated with IDQ-A scores: $\beta = -4.44, S.E. = 1.86, t(88) = -2.38, p = .02$.

Finally, when testing how each subscale related to motivation to quit and resilience, the first factor which contains withdrawal intolerance items did not significantly relate to motivation to quit: $\beta = .318, S.E. = .21, t(87) = 1.55, p = .13$. The second subscale, which contained most of the cognitive coping items, also did not significantly associate with motivation to quit: $\beta = -.052, S.E. = .15, t(87) = -.35, p = .73$. However, factor one ($\beta = -.24, S.E. = .09, t(87) = -2.62, p = .01$) and factor two ($\beta = -.29, S.E. = .07, t(87) = -4.33, p = .00$) both significantly associated with baseline resilience. Discriminant validity was only partially supported, as age was significantly correlated with IDQ-A scores, $r = -.35, p = .00$, and education was not significantly correlated with IDQ-A scores, $r = -.06, p = .61$. In light of the psychometric results, both subscales were related to all baseline and follow-up constructs. Such results are reflected in Table 11.
Table 9

Results of Baseline Regression Analyses

<table>
<thead>
<tr>
<th>Regression</th>
<th>$R^2$</th>
<th>F Statistic</th>
<th>Significance Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL IDQ-A  Discomfort Tolerance</td>
<td>.07</td>
<td>6.21</td>
<td>.02</td>
</tr>
<tr>
<td>BL IDQ-A  Anxiety</td>
<td>.10</td>
<td>10.03</td>
<td>.00</td>
</tr>
<tr>
<td>BL IDQ-A  Depression</td>
<td>.19</td>
<td>21.11</td>
<td>.00</td>
</tr>
<tr>
<td>BL IDQ-A  Motivation to Quit</td>
<td>.01</td>
<td>.714</td>
<td>.40</td>
</tr>
<tr>
<td>BL IDQ-A  Resilience</td>
<td>.19</td>
<td>20.55</td>
<td>.00</td>
</tr>
<tr>
<td>BL IDQ-A  Alcohol Dependence</td>
<td>.20</td>
<td>21.58</td>
<td>.00</td>
</tr>
<tr>
<td>BL IDQ-A  Previous Attempts to Quit</td>
<td>.07</td>
<td>5.67</td>
<td>.02</td>
</tr>
<tr>
<td>BL Factor 1 and Factor 2  Motivation to Quit</td>
<td>.03</td>
<td>1.40</td>
<td>.25</td>
</tr>
<tr>
<td>BL Factor 1 and Factor 2  Resilience</td>
<td>.20</td>
<td>11.15</td>
<td>.00</td>
</tr>
</tbody>
</table>

Predictive Validity Results

To establish predictive validity, follow-up scores of the reduced IDQ-A were related to outcomes such as drinking behavior, completion of alcohol detoxification, resilience, and discomfort tolerance. However, zero percent of the follow-up sample reported being abstinent from alcohol, so we were unable to test whether IDQ-A scores at baseline predicted abstinence at follow-up. Again, simple linear regressions were conducted to assess the relationship between baseline IDQ-A scores and outcome variables, as well as follow-up IDQ-A scores. As for the other drinking outcomes, withdrawal intolerance at baseline did not predict the number of
drinking occasions ($\beta = .26, S.E. = .36, t (87) = .71, p = .48$), nor the number of drinks per occasion ($\beta = -.01, S.E. = .23, t (87) = -.03, p = .98$). However, baseline IDQ-A scores predicted completion of alcohol detoxification: $\beta = -.306, S.E. = .11, t (87) = -2.74, p = .01$. Still, withdrawal intolerance at baseline did not predict follow-up scores of resilience ($\beta = .12, S.E. = .15, t (87) = .79, p = .43$), nor did it predict discomfort tolerance ($\beta = -.39, S.E. = .73, t (87) = ., p = .60$). However, there was also no significant difference between baseline IDQ-A scores and follow-up IDQ-A scores ($t (87) = 1.71, p = .09$). Table 10 depicts $R^2$ and $F$ tests associated with each reported regression result.

**Table 10**

**Results of Follow-Up Regression Analyses**

<table>
<thead>
<tr>
<th>Regression</th>
<th>$R^2$</th>
<th>$F$ Statistic</th>
<th>Significance Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>BL IDQ-A Drinking Occasions</td>
<td>-.01</td>
<td>.501</td>
<td>.48</td>
</tr>
<tr>
<td>BL IDQ-A Drinks Per Occasion</td>
<td>.00</td>
<td>.00</td>
<td>.98</td>
</tr>
<tr>
<td>BL IDQ-A Completion of Alcohol Detoxification</td>
<td>.08</td>
<td>7.50</td>
<td>.01</td>
</tr>
<tr>
<td>BL IDQ-A Discomfort Tolerance</td>
<td>.00</td>
<td>.285</td>
<td>.60</td>
</tr>
<tr>
<td>BL IDQ-A Resilience</td>
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<td>.43</td>
</tr>
<tr>
<td>BL IDQ-A FU IDQ-A</td>
<td>.03</td>
<td>2.91</td>
<td>.09</td>
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</table>

**Difference between Baseline and Follow-Up IDQ-A Scores**

<table>
<thead>
<tr>
<th>$t$</th>
<th>Sig.</th>
</tr>
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<tbody>
<tr>
<td>1.71</td>
<td>.09</td>
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</table>
Table 11

Post Hoc Analysis of Subscale Relationships

<table>
<thead>
<tr>
<th>Regression DV</th>
<th>Withdrawal Intolerance</th>
<th>Cognitive Coping</th>
<th>R²</th>
<th>F Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Baseline</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol Dependence</td>
<td>4.66(1.02)*</td>
<td>3.17(1.07)*</td>
<td>.14</td>
<td>14.79</td>
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<tr>
<td>Motivation to Quit</td>
<td>.16(.12)</td>
<td>-32(.13)*</td>
<td>.04</td>
<td>4.25</td>
</tr>
<tr>
<td>Previous Attempts to Quit</td>
<td>.15(.70)</td>
<td>-3.62(.74)*</td>
<td>.12</td>
<td>11.91</td>
</tr>
<tr>
<td>Discomfort Tolerance</td>
<td>1.61(.41)*</td>
<td>1.20(.41)*</td>
<td>.11</td>
<td>11.77</td>
</tr>
<tr>
<td>Resilience</td>
<td>-32(.06)*</td>
<td>-37(.06)*</td>
<td>.26</td>
<td>31.747</td>
</tr>
<tr>
<td>Anxiety</td>
<td>1.34(.31)*</td>
<td>1.11(.33)*</td>
<td>.14</td>
<td>14.84</td>
</tr>
<tr>
<td>Depression</td>
<td>1.21(.30)*</td>
<td>2.10(.32)*</td>
<td>.24</td>
<td>29.92</td>
</tr>
<tr>
<td>Age</td>
<td>-.12(.90)</td>
<td>-.74(.95)</td>
<td>.01</td>
<td>.32</td>
</tr>
<tr>
<td>Education</td>
<td>-.09(.18)</td>
<td>.13(.19)</td>
<td>.01</td>
<td>.38</td>
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<tr>
<td>Discomfort Tolerance</td>
<td>-.03(.65)</td>
<td>.44(.61)</td>
<td>.01</td>
<td>.26</td>
</tr>
<tr>
<td>Resilience</td>
<td>-.07(.13)</td>
<td>-.20(.11)</td>
<td>.04</td>
<td>1.84</td>
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<tr>
<td>Detox. Completion</td>
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<td>.26(.22)</td>
<td>.05</td>
<td>2.25</td>
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<tr>
<td>Drinking Occasions</td>
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<td>-.26(.24)</td>
<td>.09</td>
<td>4.06</td>
</tr>
<tr>
<td>Drinks Per Drinking Occasion</td>
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<td>.15(.18)</td>
<td>.01</td>
<td>.61</td>
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<tr>
<td><strong>Follow-up</strong></td>
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</table>

Note. All coefficients significant at the .05 level are notated with *.
Chapter 4: Discussion

Initial Interpretations of Findings

To establish construct validity, I originally hypothesized that results would support a three-factor model based on a measure of alcohol withdrawal intolerance made up of three subscales: withdrawal intolerance, cognitive coping, and pain intolerance. This three-factor model was not supported, given the inadequate fit indices produced by psychometric tests. However, a two-factor model of the developed IDQ-A was supported via exploratory factor analyses and item reduction. Furthermore, the new reduced IDQ-A demonstrated better overall fit to the data than the original three factor model, as well as either one-factor model (both reduced and with full items). Ultimately, the data fit a two factor model which retained items within the withdrawal intolerance subscale as well as the cognitive coping subscale, with none of the pain intolerance items.

Results regarding convergent validity were mixed. To review, I hypothesized that the IDQ-A at baseline would positively correlate with psychological and physical dependence as defined by the SADQ-C, discomfort intolerance, anxiety, and depression. I also predicted that scores from the IDQ-A would be negatively correlated with previous attempts to quit, motivation to quit, and resilience. In terms of the IDQ-A subscales, I originally predicted that cognitive coping would positively relate to motivation to quit and resilience, whereas withdrawal intolerance and pain intolerance would positively associate with SADQ-C’s measure of physical and psychological dependence, as well as negatively associate with previous attempts to quit drinking. Baseline analysis point to support of these predictions. However, IDQ-A scores were also unrelated to motivation to quit. Furthermore, we were unable to test our hypothesis regarding pain intolerance, as that subscale was reduced in the final supported model.
To establish discriminant validity and to replicate Sirota and others (2010), age and education were used for establishing discriminant validity. Discriminant validity calls for relating a measure to concepts that should not conceptually associate with it, however age appeared to have a significant negative correlation with baseline IDQ-A scores. Still, education level did not significantly correlate with baseline IDQ-A scores, showing partial support for discriminant validity. While we did not fully support discriminant validity as expected from results from Sirota et al. (2011), age and education are not the only variables that could possibly be conceptually unrelated to alcohol withdrawal intolerance. So, discriminant validity need not be completely discounted from the results of the current study.

Results regarding predictive validity were also mixed. I hypothesized a negative relationship between IDQ-A scores and resilience, discomfort tolerance, abstinence, and completion of alcohol detoxification at one-month follow-up. I also predicted a positive relationship between IDQ-A scores and drinks per drinking occasion and frequencies of drinking. Finally, I hypothesized that IDQ-A scores from baseline would not differ significantly from those at follow-up. None of the participants in our follow-up sample reported being abstinent from alcohol, so we were unable to test our hypothesis regarding abstinence. Nevertheless, IDQ-A scores did not predict participants number of drinking occasions nor the number of drinks per occasion, demonstrating a lack of support for those respective hypotheses. Follow-up resilience scores did not significantly regress onto baseline IDQ-A scores, and the same was found for discomfort intolerance. However, IDQ-A scores did demonstrate a negative association with completion of alcohol detoxification. Both regression and t-test results comparing baseline and follow-up IDQ-A scores also indicate that baseline and follow-up IDQ-A scores did not significantly differ from each other. To conclude, we did not find support for most of our
predictive validity hypotheses, except for that stating a non-significant difference between baseline and follow-up IDQ-A scores as well as predicting a significant relationship between IDQ-A scores and completion of alcohol detoxification.

Regarding the post-hoc analyses of subscale relationships with each of the constructs in our hypothesized models, convergent and discriminant validity seemed to be partially supported. The cognitive coping subscale seemed to perform in line with the baseline constructs in the expected directions based on our previous hypotheses, and such regression results reflected those previously conducted with the overall IDQ-A score as the independent variable. However, the withdrawal intolerance subscale revealed inconsistent relationships, implying that much of the convergent and discriminant validity results using the overall IDQ-A score were possibly attributed to the cognitive coping items. However, post-hoc analyses reassessing the predictive validity relationships with each subscale did not behave in that manner. Neither the cognitive coping subscale or withdrawal intolerance subscale predicted any of the outcomes of interest. Still, withdrawal intolerance appeared to predict the frequency of drinking occasions at followup. With the inconsistent relationships when including either the overall IDQ-A score or both subscales in the regression models, further measure development and possibly different models of construct relationships ought to be assessed.

In summary, the results of the current study in terms of hypothesis support offer great insight into future directions for the development of the IDQ-A. Additionally, it is a first step in clarifying reliable items for alcohol withdrawal intolerance with predictive power in terms of recovery outcomes. Furthermore, it illustrates that withdrawal and one’s preconceptions about experiences associated with it are an influential aspect of recovery provided the IDQ-A’s partial support of predictive validity. Provided that the IDQ-A predicted completion of alcohol
detoxification, one can begin to infer that withdrawal intolerance can be targeted in future interventions which, if supported, would provide meaningful clinical resources. After further development and validation, the IDQ-A itself could be used as a relapse risk assessment prior to treatment initiation and before alcohol detoxification.

To begin interpreting the factor analysis results, support for a reduced two factor model with reduced items rather than the originally proposed three-factor model indicates a need to further develop the IDQ-A to ensure items pertain to specific experiences of alcohol withdrawal, as the current withdrawal intolerance items do not reflect all symptoms outlined in the DSM-V symptoms criteria, nor are they representative of all qualitative findings (American Psychiatric Association, 2013; Najera et al., 2019). Among the diagnostic criteria for alcohol withdrawal syndrome, mild symptoms were addressed in the current version of the IDQ-A at most, while more severe symptoms such as seizures and hallucinations were not (American Psychiatric Association, 2013). Moreover, several phenomenological coded themes captured psycho-social aspects of the experience of withdrawal that were, again, only partially addressed in the current IDQ-A.

Furthermore, the result of the entire pain intolerance subscale was removed during item reduction provides a call for consideration into how pain is characterized as it pertains to the experience of withdrawal. While pain can be a part of discomfort and feeling unwell, the items referring to pain intolerance in the IDQ-A referred only to general pain management and not to the possible pain that is congruent with alcohol withdrawal. For instance, pain items spoke of needing immediate soothing from pain, rather than pain related to withdrawal such as stomach and muscle pain (American Psychiatric Association, 2013). Furthermore, the rest of the items in the other subscales have a direct reference to a withdrawal experience, whereas the pain
intolerance items do not. While we allude to the physical discomfort within the IDQ-A, results indicate that the physical pain associated with alcohol withdrawal was not adequately assessed.

As for the mixed results in terms of convergent and discriminant validity, while we did not support all hypotheses, value still remains regarding their meaning and possible explanations. For one, the IDQ-A was congruent with many established measures that ought to relate to one’s perceived ability to tolerate experiences of alcohol withdrawal. Regarding the non-significant findings, a lack of association between IDQ-A scores and motivation to quit may actually be a favorable outcome, as it infers that regardless of one’s readiness to change or quit drinking, one’s tolerance for the first and most pivotal part of recovery can vary. Intolerance to experiences associated with alcohol withdrawal that is separate and unrelated to one’s motivation to make change can inform future interventions, as even those low in motivation could likely possess or bolster their tolerance and readiness for one of the first and most difficult aspects of recovery. Similarly, a possible explanation for the significant regression of previous attempts to quit on IDQ-A scores is that depending on one’s experience with alcohol withdrawal, one’s intolerance for the experience might decrease.

The mixed results for discriminant validity may be due to differences between alcohol and smoking in terms of the relationship between age and aspects of dependence (Dawson et al., 2008; Grant et al., 2012; Sirota et al., 2011). Research indicates that there are age related milestones when they have their first drink and the onset of alcohol dependence or use disorder (Dawson et al., 2008; Grant et al., 2012). For instance, earlier age of one’s first drink has been associated with earlier onset of alcohol misuse and use disorder (Dawson et al., 2008). While not explicitly clear based on Sirota and others’ (2011) reasoning for including age as an indicator of discriminant validity is unclear, the same underlying assumptions for smoking dependence and
cessation may not be applicable to alcohol in terms of the role of age. With age being related to alcohol problems, how many times they relapse from problems, and their general resilience, we cannot conceptually presume that alcohol withdrawal intolerance is unrelated to age as Sirota and others (2011) said about age and smoking withdrawal intolerance. Furthermore, while dated, previous research has related age, smoking onset, and smoking cessation (Kherder et al., 1999). So, including age as a point of discriminant validity in either case could have been a poor methodological choice. Still, discriminant validity ought not to be completely discounted, as age and education are among a vast variety of possible constructs to achieve such validity.

Finally, while interpreting predictive validity results, it is possible that one month and a single attempt at recovery is not enough to see significant changes in one’s discomfort tolerance or resilience, provided that baseline IDQ-A scores did not predict resilience nor discomfort tolerance at follow-up. Such constructs in people might require longer time periods to assess change. To interpret our other predictive validity findings, stable IDQ-A scores between baseline and follow-up indicate that if one begins recovery with a high perceived tolerance for experiences associated with alcohol withdrawal, that perceived tolerance will presumably remain high within one month of attempting to initiate recovery. Hence, this can be a favorable finding because results infer that if withdrawal tolerance were to be bolstered towards the beginning of recovery, that tolerance can presumably remain stable long enough for one to get through the initial stages of recovery. On the other hand, it could also mean that alcohol withdrawal intolerance is a stable characteristic resistant to change. Furthermore, the IDQ-A predicted completion of alcohol detoxification, meaning high scores of withdrawal intolerance predicted one’s likelihood of not completing detox within one month, furthering the idea that one’s perceived ability to go through withdrawal is a possible risk factor in terms of early relapse after recovery initiation.
Results Considering Current Literature

Alcohol withdrawal in terms of both psychological and physical experiences remains under-investigated, however the results of the current study further the research that currently exists. Our results are consistent with the early development of the IDQ-S for nicotine withdrawal (Sirota et al., 2011). For one, our difficulty with retaining pain intolerance items reflects the validation process of the IDQ-S. Sirota and others (2011) tested separate measures of varying intolerances before finalizing their withdrawal intolerance measure. What was included in their final subscale of pain intolerance (3 items) was a much smaller set of items than originally tested (14 items) during their early development of pain intolerance questions (Sirota et al., 2011). Provided that their item reduction strategies resulted in a much smaller pain intolerance subscale compared to the size of the other two subscales in the IDQ-S, it is understandable to find that our own pain intolerance subscale demonstrated poor or inconsistent loadings throughout our model testing and item reduction strategies.

In addition to our validation and item reduction results, our project also replicates Sirota et al. (2011) in terms of convergent and partially discriminant validity. The previous researchers related their IDQ-S to their chosen measures of discomfort, depression, as well as anxiety, just as the current study did (Sirota et al., 2011). Furthermore, the IDQ-S demonstrated predictive validity as the IDQ-S predicted relapse in smoking after three months with the occurrence of nicotine dependence as characterized by (Rohsenow et al., 2015). Similarly, while we were unable to predict drinking behavior in the current study, we did establish a negative association between baseline IDQ-A scores and completion of alcohol detoxification, meaning that lower alcohol withdrawal intolerance predicted that participants would complete detox.
Furthermore, our predictive validity results are consistent with current high percentages of relapse soon after initiating recovery, provided that baseline IDQ-A scores related to detoxification completion after one month and none of our follow-up sample reported abstinence (Dakota et al., 2019; Kelly et al., 2019; Manning et al., 2021). For instance, current relapse rates indicate that those who attempt to quit alcohol tend to relapse within the first month of recovery initiation, high IDQ-A scores predicted an inability to complete detox (Kelly et al., 2019).

Furthermore, while zero abstinence at follow-up can certainly be considered a limitation, it is consistent with previous literature by softly implying that all relapsed within the one-month of initiating recovery (Kelly et al., 2019). Moreover, current trends also indicate that barely over seven percent receives treatment, and even then, most relapse within 90 days of treatment (Kelly et al., 2011; Manning et al., 2011; NIH, 2021). Combined with the consideration that most of the sample from the current study consisted of those who either attempted to quit “on their own” or via a treatment program, again it comes as no surprise that our sample did not report abstinence at follow-up.

When considering qualitative findings of the experience of withdrawal and its meaning within the context of recovery, the IDQ-A reflects psychological experiences associated with alcohol withdrawal. However, due to concerns of questionnaire length and attention fatigue, we did not include all possible qualitative reflections of the experience of alcohol withdrawal, such as experiences of isolation, social perceptions, unique gender experiences, and more (Najera et al., 2019). Still, only two of the items added to the original questionnaire, rather than reworded to pertain to alcohol or drinking, were removed during item reduction. Whereas nine of the original items from the IDQ-S that were adapted were also reduced, which named specific physical symptoms of withdrawal such as “feeling jittery” or feeling “irritable.” Items that were retained
included items referring to psychological symptoms, such as being unable to stand feeling anxious or referring to their “mind not feeling sharp.” In combination of the inconsistent cross loadings and poor loadings throughout item reduction, the results point to a possible need for greater distinction between physical and psychological discomfort associated with alcohol withdrawal. The item reduction results could also point to a greater emphasis of the impact of psychological experiences associated with withdrawal on recovery outcomes, which is promising in terms of possible intervention development.

The end result of the reduced IDQ-A which best fit the data from the current study resembles distinct measures of overall withdrawal intolerance and cognitive coping, whereas a distinct psychological experience of alcohol withdrawal was captured by the cognitive coping scale. The cognitive coping scale is framed positively, including items suggesting that going through such an uncomfortable experience is “worth the rewards,” and that “I will get through it.” The cognitive coping items also allude to a time after withdrawal, whereas the withdrawal intolerance subscale refers to withdrawal itself. With this in mind, the cognitive coping scale and its relationship to resilience at baseline reflect one of the central coded themes found in the phenomenological investigation of alcohol withdrawal and the meaning attributed to the experience, self-reassurance (Najera et al., 2019). Self-reassurance, which was reflected in common statements from participants, described a cognitive process of thinking beyond withdrawal as well as reassuring oneself that each day of the experience will be more bearable than previous days (Najera et al., 2019). Many participants also referred to withdrawal as a necessary experience, one that would make them a better, stronger person, which is also reflected in the cognitive coping subscale of the IDQ-A (Najera et al., 2019). Given that the IDQ-A reflects one’s perceived ability to withstand and get through alcohol withdrawal, this points to a specific
psychological process which appeared to be a mechanism of early recovery outcomes in the
current study: An apparently positive outlook with thought content which focuses on the
temporary nature of unpleasant experiences and a positive outlook and belief that one will feel
better in the future.

**Limitations**

While our study offers novelty in terms of developing a measure of an otherwise
underinvestigated construct, there are several limitations to consider. First, while our sample
provides variability in terms of the routes one might take to recover from alcohol dependence,
therein also lies a shortcoming of the study, as some participants may have been closer to
experiencing withdrawal and initiating recovery when compared to others. For instance, someone
about to enter a formal inpatient program or outpatient program might perceive their tolerance for
withdrawal experiences differently than someone who is contemplating quitting drinking on their
own. Furthermore, our sample size was not robust enough to test group differences in terms of
treatment routes taken, even though participants were asked how they initiated change if they did
within the one-month follow-up period. Another limitation of the sample collected in the current
study was that none of our participants reported abstinence at one-month follow-up, indicating
that even those with low IDQ-A scores and therefore high perceived tolerance to experiences
associated with alcohol withdrawal were not abstinent from alcohol within one month of
initiating recovery. This works against some of our key findings in terms of recovery outcomes,
as this finding is difficult to interpret provided that our drinking behavior questions do not specify
when participants drank again after initiating recovery.

Another limitation of the study was the nature of our recruitment. While bot and fraud
detection as well as other protective measures were implemented into the makeup of our online
survey, participants could have determined the goals of the survey from the online advertisements or the survey questions, introducing possible bias in the answers to obtain compensation. For that reason, we implemented low amounts of compensation for completing each survey, however the raffle prize as well as any amount of compensation could have motivated participants to take the survey and influenced the effort, they put into answering each question honestly. While repeat attempts were prevented when participants were taking the survey, first time attempts that were dishonest are also likely. While Sirota and others (2011) cited their sampling strategy of a single, urban group as a limitation, their strategy also holds strength as it allowed them to evaluate who met inclusion criteria in person, given that their sample came from those initiating a program to help participants quit smoking.

Furthermore, another limitation of the current study was, given that participants could have initiated recovery at any time between baseline and follow-up based on how our survey screened and ascertained alcohol detoxification completion, the IDQ-A measure could have measured different aspects of withdrawal intolerance. For instance, for those who initiated recovery soon after completing the measure, the IDQ-A was measure perceived withdrawal intolerance as it was about to happen. On the other hand, among those who did not initiate recovery soon after completing the measure, the IDQ-A would have been measuring withdrawal intolerance hypothetically or as a distant possibility. Hence, the specific aspect of withdrawal intolerance is difficult to determine based on the sampling of the current study.

Despite the variability in how soon participants could have initiated recovery, variance explained by the factors of the supported IDQ-A were favorable. Standards for acceptable variance explained tend to vary, however general recommendations point to contextualizing the variance explained within factor analyses rather than simply using explained variance to confirm
or question the integrity of a measure (Mulaik, 2009; Peterson, 2000; Streiner, 1994). The aspect of alcohol withdrawal intolerance that was captured in the current study is unclear based on the amount of time that could have passed between baseline and when participants initiated recovery, which can be taking away from the construct validity of what the current study was trying to measure. So, while our measure explained a great majority of the variance in the data collected in the current study, in combination of the overall validity results and methodological considerations, the results still stress further development and validation of the measure before testing it within clinical settings. Future research ought to further the validity of the IDQ-A by clarifying the current limitations as well as incorporating various methods for item and subscale development.

**Future Directions**

The current study was a first step in adapting a withdrawal intolerance questionnaire for smoking cessation towards alcohol withdrawal (Sirota et al., 2011). Findings begin to provide construct, convergent, discriminant, and predictive validity, however the mixed results also indicate a need for further investigation and development of the measure. While several items were added to the questionnaire to account for common experiences described in qualitative investigations of alcohol withdrawal, some were not specific in terms of the exact feeling or symptom being communicated (Najera et al., 2019). For instance, one of the items that was eliminate from the final IDQ-A was “I can’t stand the strange sensations I get when I go too long without drinking.” Future research should aim to refine and specify the item make-up of the IDQ-A, as the final product from the current study ought not to be the final product of a meaningful clinical resource.
While alcohol withdrawal often produces unfamiliar feelings of discomfort that feel strange or overwhelming, “strange sensations” can refer to a wide variety of experiences not related to alcohol quitting drinking or withdrawal symptoms. Furthermore, many items seemed to be measuring the same thing more than once, hence the item referring to “strange sensations” was eliminated but an item that contains language saying “I can’t stand how I feel,” was retained. Given the eliminated items, the remaining items may not encapsulate the entire experience of alcohol withdrawal, especially in terms of measure each of the validated symptoms according to diagnostic manuals and the more abstract experiences brought to light by qualitative investigations (American Psychiatric Association, 2013; Najera et al., 2019). Furthermore, only a few coded themes of the experience of withdrawal were included in the first iteration of the IDQA (Najera et al., 2019). While promising, there are other common themes from qualitative findings that were not addressed or reflected via the IDQ-A developed in the current study, such as mental, social, and spiritual experiences of withdrawal, as well as overall meaning attributed to the experience in terms of recovery (Najera et al., 2019). Similar to what was found in terms of the cognitive coping subscale, further assessment of how such complex psychological, social, cultural, and spiritual experiences associated with alcohol withdrawal impact recovery outcomes ought to be explored. While the reduced IDQ-A showed satisfactory model fit and psychometric support, further development may be necessary to ensure that the final measure provides a thorough tool of construct and predictive merit.

As a possible next step following the current study, a unique IDQ-A completely generated by consulting alcohol specific literature and established symptomology can begin to further isolate factors which attribute to withdrawal intolerance and have the most predictive power regarding recovery outcomes. Qualitative data collected from key stakeholders such as mental
health care professionals, peer leaders, as well as those who have experienced withdrawal and recovery can provide insight into item and subscale development. Moreover, validating the IDQA amongst varying populations and recovery settings would prove beneficial to measurement development, as to ensure its generalizability. From the current study, it is unclear whether one’s method of recovery interacts with one’s intolerance to alcohol withdrawal experiences.

In terms of strengthening convergent and discriminant validity, the IDQ-A ought to be put against more measures that could be conceptually related to alcohol withdrawal intolerance, as well its specific subscales. For instance, while the current version of the IDQ-A was not associated with motivation to quit as represented by a ladder of change resembling one’s readiness to change their drinking, perhaps other aspects of motivation could be related to the IDQ-A such as measures of intrinsic and extrinsic motivation. Furthermore, the measure should also be examined along with measures of stable versus variable pre-existing characteristics. For instance, personality is often thought to be a stable characteristic, with some developmental variability at most (Bleidorn et al., 2022). Whereas mental skills such as self-regulation and stress management are more variable between individuals and can be developed or improved (Leder & Zawidzki, 2023). Understanding how the IDQ-A relates to such measures could further an understanding of how withdrawal intolerance can be reliably altered to improve recovery outcomes.

Another future direction for this line of research is to assess different follow-up periods and assess how far withdrawal intolerance remains consistent, especially with multiple attempts to quit being considered as an expected component of the recovery process (DiClemente & Crisafulli, 2022; Kelly et al., 2019; MacKillop, 2020). Assessing the IDQ-A during the first month of recovery during which withdrawal is experienced validates its predictive power
immediately before and after the pivotal experience of withdrawal, however future research should investigate how far its predictive power extends. Withdrawal intolerance, in combination with being compared to conceptually related constructs, could speak towards other characteristics and conditions which increase one’s likelihood of maintaining treatment and recovery goals as well as reducing risk relapse at any stage rather than only early recovery.

Additionally, future research specific to the development of the IDQ-A should work to address the limitations of the current study. For one, future research should aim to test the IDQ-A among samples specific to the various approaches to recovery, as the meaning of withdrawal and one’s perception of their ability to go through it can change based on the resources and support available. For instance, one study could replicate Sirota et al. (2011) and sample from an outpatient program, while another study could validate the IDQ-A among those attempting to quit via an inpatient program, and so on. Different versions of the IDQ-A and the needs of each distinct pool of clients could be highlighted, furthering the clinical application of the concept of withdrawal intolerance and its predictive power. Overall, the current study opens a vast program of research which could have empirical, clinical, and educational implications.

**Implications and Conclusions**

The proposed study serves as part of a clinically impactful line of research, as alcohol withdrawal is often under treated and inadequately integrated into the continuum of care for AUD (Blondell et al., 2011; Najera et al., 2019). Indeed, pharmacological understanding of alcohol withdrawal abounds but addresses a fraction of the experience, which sparked my undergraduate honors thesis, a qualitative investigation to better understand its psychological impacts (Najera et al., 2019). From which, we learned alcohol withdrawal is not prioritized in clinical care and clients are left feeling isolated in their suffering (Najera et al., 2019). However, alcohol
withdrawal can be leveraged in recovery if it is viewed as a transformative experience, one during which they “face demons, walk through hell, and crawl out of a dark pit” to begin anew (Najera et al., 2019). Such findings combined with that from the current study provided possible cognitive and emotional processes that can lead to successful detoxification completion and recovery from alcohol use problems (Najera et al., 2019).

From smoking cessation research came an opportunity to quantify key aspects which predict recovery outcomes (Rohsenow et al., 2015; Sirota et al., 2011). By adapting a withdrawal intolerance measure previously intended to measure nicotine withdrawal symptoms (IDQ-S) we developed the IDQ-A for alcohol withdrawal symptoms. Many of the IDQ-S items and its factors align with both physical and psychological experiences which are neglected in other measures of withdrawal (Gossop et al., 2002; Mirijello et al., 2015; Rohsenow et al., 2015; Sirota et al., 2011; Williams et al., 2001). Furthermore, other questionnaires measure withdrawal in the moment, whereas the IDQ-S provides opportunity for a proactive measure of withdrawal in terms of one’s perceived tolerance for its associated discomfort. While leveraging the structure and orientation of the IDQ-S, previous qualitative findings describing the experience of alcohol withdrawal contributed to item development of the IDQ-A (Najera et al., 2019; Sirota et al., 2011).

By validating the IDQ-A, we address both physical and psychological processes which, in turn, effect one’s success in recovery, as well as identify possible mechanisms of the high relapse rates that have stricken the U.S. (Kelly et al., 2011; Manning et al., 2011; Rohsenow et al., 2015). Thus, the current study offers a direction for the development of valuable clinical tool which will eventually allow mental health professionals to target those with higher risk for not completing detoxification or relapsing soon after. Finally, while the current study begins to identify some areas of risk, it remains unclear as to how many there are and how clearly they are defined.
Addressing such clarifications can lead to development of a behavioral intervention designed to address the needs of those going into withdrawal from an AUD can yield benefits in clinical practice (Becker, 2008; Blondell et al., 2011; Yeh et al., 2009). Ultimately, such an intervention will be aimed at reducing the high relapse rates which happen soon after alcohol cessation and increase the success rate of those who initiate recovery from alcohol dependence.

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Vita

Sarah Najera was born and raised in El Paso, Texas. During her undergraduate studies, Sarah was selected to be a BUILD Scholar from 2016 to 2019, which entailed participation in a research-intensive program and full scholarship funded by the National Institute of Health, aimed at increasing diversity in advanced STEM fields. Within the BUILD Scholars program, she completed an Honors Thesis, aimed at investigating the lived experience of alcohol withdrawal, which was nominated for Outstanding Honors Thesis in 2019. She completed her Bachelor of Arts in Psychology with a minor in Sociology at The University of Texas at El Paso (UTEP), summa cum laude, in 2019. She soon enrolled in the Health Psychology PhD program at UTEP, during which she also completed a Master of Arts in Clinical Psychology.

While a graduate student, Sarah was awarded the Doctoral Excellence Award for her outstanding achievements in research. She served as a research assistant and undergraduate mentor within the Latino Alcohol Health Disparities and Research Center, under the direction of her mentor, Dr. Craig Field. She also won the Dodson Research Grant in 2022, which funded her Masters thesis project.

Currently, Sarah is completing her Health Psychology Doctoral Degree at UTEP, working as a teaching assistant and clinical intern. She lives in El Paso, Texas.