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Development of a Novel Measure to Assess for Alcohol Misuse in Older Adults: The Alcohol Misuse Scale for Older Adults (AMSOA)

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DEVELOPMENT OF A NOVEL MEASURE TO ASSESS FOR ALCOHOL MISUSE IN OLDER ADULTS: THE ALCOHOL MISUSE SCALE FOR OLDER ADULTS (AMSOA)

by

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(Under the Direction of Jeffrey Klibert, Ph.D)

ABSTRACT

Alcohol is the most regularly used intoxicating substance in most geographic locations. Alcohol use in the United States specifically is well over global averages. While alcohol misuse is generally considered to be understood as a problem for younger adults, it is often unrecognized and understudied older adult populations. Currently, there is an absence of a comprehensive tool measuring for developmentally salient behaviors, symptoms, and features of alcohol misuse in older adulthood, which blocks researchers' ability to measure alcohol misuse well. The purpose of this study is to develop a psychometrically valid and reliable assessment of alcohol misuse for older adult populations. Three separate studies were conducted to evaluate the psychometric properties of the developed measure. Using an exploratory factor analysis, the first study identified a suitable two-factor structure of misuse. Content of identified factors aligned closely with the notion of adverse outcomes and drinking intention. The second study used a confirmatory factor analysis to confirm the two-factor structure. Results revealed solid to good fit to the data. Finally, the third study evaluated internal consistency and convergent validity for the two-factor structure. Results highlight strong reliability estimates and meaningful correlations with theoretically related constructs, including depression, health, and general alcohol use. These findings suggest the developed measure is a robust assessment for alcohol misuse in older adult populations. Results also detected mixed findings related to demographic differences (i.e., gender identity, rural status) in reports of alcohol misuse dimensions. Most

interestingly, in the third study older adult men residing in rural areas report higher scores on the

misuse dimensions than older adult men residing in urban areas. The opposite appears to be true

for women. Overall, these findings extend the literature related to alcohol misuse for older adult

populations by offering a novel measure to assess for developmentally salient behaviors. It will

be important for future researchers to determine how the developed measure can be used to

direct treatment consideration with older adult populations.

*INDEX WORDS: Alcohol misuse, Older adults, Alcohol use, Depression, Health, Social support,
Rural, Developmental*

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CHAPTER 1: LITERATURE REVIEW

Rationale

Alcohol is the most regularly used intoxicating substance in most cultures (American

Psychiatric Association [APA], 2013). This is especially true in the United States as rates

consistently remain above global averages. Specifically, 85.6% of people aged 18 and older

report consuming alcohol in their lifetime, 69.5% report consumption in the past year, and 54.9%

report consumption in the past month (National Institute on Alcohol Abuse and Alcoholism

[NIAAA], 2021). Although low levels of drinking can have minimal to no effects for many

individuals, alcohol use in larger quantities contributes to further alcohol-related difficulties and

severely negative health, social, and cognitive consequences. In the U.S., the 12-month

prevalence for alcohol use disorder among adults aged 18 years and older is estimated at 8.5%

(APA, 2013). Furthermore, 25.8% of individuals aged 18 and older report engaging in binge

drinking and 6.3% report engaging in heavy alcohol use (binge drinking on five or more days) in

the past month (NIAAA, 2021). Heavy or binge drinking behaviors are life-threatening;

individuals engaging in binge drinking are between 70 to 93 times more likely to have an

alcohol-related emergency department visit compared with individuals who do not engage in

heavy or binge drinking (NIAAA, 2021). On a global scale, alcohol misuse is the seventh leading

risk factor for premature death and disability (NIAAA, 2021). Moreover, three million annual

deaths (5.3% of global deaths) are attributable to alcohol consumption. In the U.S., alcohol use is

attributable to 95,000 deaths per year, making it the leading preventable cause of death (NIAAA,

2021).

Although alcohol consumption can be problematic for younger populations, these

problems remain a concern for adults over the age of 65. Within the older adult population, about

40% of individuals report consuming alcohol (NIAAA, 2019), more than 10% report binge

drinking in the past month, and about 2.5% report heavy drinking in the past month (Substance

Abuse and Mental Health Services Administration [SAMHSA], 2019). In addition, 1.03 million

older adults or 1 in 75 (1.5%) meet criteria for alcohol use disorder in a 12-month period (APA,

2013; SAMHSA, 2019). Within this population, research indicates the frequency of alcohol use

disorder more than doubled from 2001 to 2013 (Grant et al., 2017), and this trend is steadily

increasing (Breslow et al., 2017).

Unfortunately, what alcohol misuse looks like within the older adult population is often

unrecognized and understudied, and future research is blocked by the inability to measure

alcohol misuse well. This is exceptionally problematic as it is imperative to acknowledge how

older adults experience unique biological, behavioral, and social changes (Kuerbis et al., 2014).

Because of the developmental transitions older adults face and their individual responses to

them, they face distinctive sets of difficulties that are not experienced by younger populations,

particularly those related to alcohol misuse. For instance, changes in metabolism, body fat, and

body fluid limit the ability to break down the toxins that affect vital organs, such as the brain and

heart, resulting in more severe behavioral and cognitive consequences for drinking (Arndt &

Schultz, 2015).

Moreover, because older adults are more likely to have general health problems requiring

prescribed medication (NIAAA, 2019), the negative effects of alcohol misuse are exacerbated for

this population (Kuerbis et al., 2014). Likewise, the presence and proneness of chronic pain

affects the frequency, duration, and severity of anxious, depressive, and other behavioral type

symptoms such as substance use (Kuerbis et al., 2014). Falling behaviors are also a significant

concern among older adults, and alcohol consumption exacerbates the risk of falling and other

accidental injuries (National Institute of Aging [NIA], 2017). Similarly, alcohol misuse may

exacerbate problematic social behaviors (e.g., isolation, reclusiveness) for older adults who may

need frequent and diverse types of social support compared to younger adults (Kuerbis et al.,

2014). Given these developmental differences, adults over the age of 65 who are optimally

healthy and are not taking medication should not be consuming more than one to two drinks per

day and no more than seven drinks per week (NIAAA, 2019). If health concerns or regular

medications are present, drinking patterns may need to be lessened or removed completely

(NIAAA, 2019).

Purpose

Given these differences, it is important for researchers to evaluate alcohol misuse in older

adult populations using more comprehensive and tailored methods of exploration. However, such

endeavors are hampered due to a lack of psychometrically sound measures of alcohol misuse for

older adults. There is a lack of research and data in devising alcohol use measures targeting

specific misuse behaviors, symptoms, and features associated with older adulthood. Since

alcohol misuse is a stark public health concern among older adult populations, appropriate

measures need to be developed. Currently, the field possesses an effective screening measure for

alcohol misuse with this population (Blow et al., 1992), however, there is an absence of a

comprehensive tool for measuring unique behaviors, symptoms, and features of alcohol misuse

specific to older adults.

The purpose of this study is to construct and psychometrically validate a measure of

alcohol misuse for older adults. Given this primary goal, the current study attempts to:

1) identify several, internally consistent factors of alcohol misuse (e.g., physical,

cognitive, social);

2) develop and validate a sufficient factor structure of the measure;

3) validate alcohol misuse factors with theoretically relevant constructs of alcohol

misuse; (e.g., health, depression, social support);

4) establish if alcohol misuse factor scores vary by gender and rural status.

Significance

The current study is needed to better identify and assess alcohol misuse behaviors, symptoms, and features for older adults. Many older adult clients are administered instruments designed and psychometrically validated with younger populations, which may lead to errors in how older adults are diagnosed and treated for alcohol-related problems. By developing a more developmentally relevant and appropriate measure for misuse behaviors, researchers will be able to evaluate key processes in how older adults first engage in, maintain consistent use of, and exacerbate problematic alcohol-related difficulties. In addition, researchers can identify important risk and protective factors playing a role in the exacerbation or minimization of the impacts of alcohol misuse specifically for the older adult population. Moreover, clinicians will be able to use the measure as a means to more accurately identify and diagnose older adults who present with alcohol use concerns. In turn, clinicians will be better equipped for conceptualizing the impact of alcohol misuse on older adult health and develop more appropriate and beneficial methods for treating these difficulties.

Definition of Terms

Alcohol Misuse. Alcohol misuse describes alcohol consumption in an adverse manner, situation, frequency, or amount that could lead to health and social consequences to oneself or others around them (Centers for Disease Control and Prevention [CDC], 2018; NIAAA, 2021). Alcohol misuse is typically identified as daily consumption of five or more drinks for men or

four or more drinks for women, or it can be classified by a weekly consumption of 15 or more drinks for men or eight or more drinks for women (NIAAA, 2021). However, as mentioned earlier, healthy adults over the age of 65 should not be consuming more than one to two drinks per day and no more than seven drinks per week (NIAAA, 2019). Alcohol misuse can increase the risk of, cause, or exacerbate a wide array of detrimental immediate effects (e.g., memory loss, sickness, relational conflict, physical and sexual violence, vehicular and other accidental injuries or deaths) and long-term consequences (e.g., hypertension, liver disease, diabetes, heart disease and stroke, brain damage, cancers, sleep problems, relational isolation, mental health concerns; APA, 2012; CDC, 2018; NIAAA, 2021). Identifying important factors and symptoms of alcohol misuse for older adults is the primary target for this project.

Depression. According to the Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-5), depression is characterized as a mood disorder with persistent feelings of sadness and anhedonia (APA, 2013). Other common symptoms of depression may include significant changes in weight or appetite, sleep concerns, psychomotor agitation or retardation, fatigue or loss of energy, feelings of worthlessness or excessive guilt, concentration difficulties, and recurrent suicidal thoughts (APA, 2013). In the current study, depression is measured to establish convergent validity.

Social Support. Social support is often characterized as the quality of an individual's social integration, along with the strength and expansiveness of social networks (Schwarzer, Knoll, & Rieckmann, 2004). Furthermore, social support can describe an individual's perceived availability of care and support from interpersonal relationships which can function to enhance mental and physical health (Rodriguez & Cohen, 1998; Schwarzer, Knoll, & Rieckmann, 2004; Taylor, 2011). Individuals within a social network may include, but are not limited to, a partner,

family members, friends, coworkers, neighbors, community ties, or even a pet (Schwarzer, Knoll, & Rieckmann, 2004; Taylor, 2011). Social support will also be measured to establish convergent validity.

General Health. General health is a term that is typically used to think about and discuss physical health conditions, however, health can broadly encompass many facets of an individual's abilities and well-being. For this study, general health is considered to characterize cognitive ability, physical mobility, self-care, social participation, and life activities. Extending the definition of general health to domains outside of physical ability can have benefits to recognizing individuals' particular needs and how these needs impact their day-to-day functioning (Üstün et al., 2010). General health will also be measured to establish convergent validity.

Literature Review

As previously mentioned, though alcohol remains a concern for youth and young adult populations, the presence for alcohol use concerns in older adults is more likely to go unnoticed (Fagbemi, 2021; Substance Abuse and Mental Health Services Administration & Administration on Aging, 2020; Steinhagen & Friedman, 2008). This trend is particularly due to the lack of awareness of how alcohol use affects older adults (Fagbemi, 2021). There are many factors and circumstances unique to older adults, especially when compared to younger populations, warranting more consideration (e.g., physical health decline, cognitive ability decline, changes in social support) in conceptualizing alcohol misuse (Kuerbis et al., 2014; NIAAA, 2017). It is imperative to explore and consider these factors as they can significantly exacerbate the effects of alcohol (Arndt & Schultz, 2015; NIA, 2017; NIAAA, 2019).

Alcohol Misuse in Older Adults

There is a noteworthy need to create a stronger foundation of knowledge for alcohol use among samples of older adults so theoretical research can be expanded and treatment implications can be established (SAMHSA, 2020a; SAMHSA, 2020b; Shutte et al., 2014). Currently, theory development and treatment effectiveness for alcohol use in older adult populations is somewhat vague due to a lack of focused research agenda with this population (Bartels et al., 2014; SAMHSA, 2020b; Shutte et al., 2014).

There are numerous considerations to be made when looking at how developmental changes in older adulthood affect alcohol consumption and experience. For example, biological changes, including changes in metabolism, body fat, and body fluid limit, inevitably and persistently worsen the impact of alcohol use, especially by limiting the body's capacity to diminish the toxins within alcohol (Arndt & Schultz, 2015). In turn, this detriment can progressively deteriorate vital organ functioning (Arndt & Schultz, 2015), leading to more traumatic physical harm and difficulties with recovery. At the same time, the beneficial effects of medicine decrease, and interactive effects increase during alcohol use, because of these same biological changes (NIAAA, 2019).

Similarly, there are behavioral and social considerations unique to older adulthood, which exacerbate the effects of alcohol misuse in this population. Behaviorally, older adults are more likely to become less active due to the presence of chronic pain, difficulties with physical mobility, and a general proneness to physical injury (Kuerbis et al., 2014). These concerns are worrisome as physical ability becomes even more impaired by the effects of alcohol and the risk of falling for older adults can be life-threatening (NIA, 2017; Steinhagen & Friedman, 2008). As a result of these adverse developmental changes, older adults are more likely to turn to alcohol use to help relieve the severity of their symptoms and cope with their experiences (Brennan &

Soohoo, 2013; SAMHSA, 2020b). These considerations become a vicious cycle as alcohol misuse can lead to many impairments and consequences, while, at the same time, many of these impairments and consequences can also be motivators to use alcohol. Moreover, social isolation is more likely to occur in older adulthood (Kelly et al., 2018; Stahl & Schulz, 2014; Steinhagen & Friedman, 2008). Because of the previously noted behavioral limitations (e.g., physical ailments) older adults are unable to continuously engage in previously enjoyed social activities (Kuerbis et al., 2014; NIAAA, 2019). In addition, older adults' friends and family cohort may also be experiencing social limitations or physical declines, making it more difficult to schedule or arrange for social support events. For instance, spouses or other loved ones could be experiencing significant health concerns leading to limited social interactions. Furthermore, older adults experience significantly higher rates and effects of grief and bereavement in day-to-day life (Lekalakala-Mokgele, 2018; Shear, Ghesquiiere, & Glickman, 2013). In response to reduced social engagement, older adults may turn to alcohol to help cope with emotional pain stemming from a perceived loss of support (Kelly et al., 2018; Stahl & Schulz, 2014; Steinhagen & Friedman, 2008). With all these considerations, older adults are facing unique developmental and social changes in their lives which can affect their overall mental health and further exacerbate risk to alcohol misuse (Kuerbis et al., 2014).

Given these trends, it is important to obtain more specific data regarding alcohol misuse concerns in older adults and how these problems affect different health and social outcomes. However, these research endeavors are blocked by the lack of a comprehensive alcohol misuse measure for this population. Previous research examining alcohol misuse in older adult samples often rely on general or culturally misrepresented assessment to draw meaningful conclusions regarding the effects and consequences of these behaviors. For instance, a large proportion of

research evaluating alcohol use trends in older adult samples rely on screening measures like the Alcohol Use Disorder Identification Test (AUDIT; Fagbemi, 2021; SAMHSA, 2020b; Tevik et al., 2021). Screening measures are useful in quickly identifying individuals who meet an at-risk level of alcohol use or who meet a diagnosis of alcohol use disorder. However, they are quite limiting when trying to obtain a more concrete and comprehensive evaluation of risk, unique features, and consequences of engaging in alcohol use. Notably, screeners fail to promote understanding or guide treatment due to their lack of depth and breadth to account for wider range of scores in various components of a construct (Kazdin, 2003).

Similarly, a significant number of alcohol misuse measures often conceptualize alcohol misuse from a predominantly younger developmental perspective. Notably, key alcohol misuse screeners and inventories were validated with younger populations of people (McLellan, 1980; Miller, 1985; Miller, 1999; WHO, 2001). This is important because if researchers decide to use one of these "gold standard" assessments to track alcohol misuse in older adult populations, some of the items may not developmentally represent key features or unique consequences of engaging in these behaviors from an older adult perspective. This, in turn, leads to an incomplete and inaccurate assessment of alcohol misuse in older adult samples, skewing or delaying the establishment and validation of developmentally salient theories and models to support prevention and recovery efforts in this population (Taylor, Jones, & Dening, 2014; Tevik et al., 2021). In order to move the literature forward, it is important to evaluate how the substance abuse literature may be skewed through the use of the unrepresented measures within this population.

Current Measures of Alcohol Use

A vast amount of research, including the development of scales, questionnaires, and interventions, evaluates alcohol misuse in adolescent and young adult samples (SAMHSA, 2020b). This is not surprising as the prevalence of Alcohol Use Disorder is greatest in younger age groups (American Psychiatric Association, 2013); though about 40% of older adults report consuming alcohol (NIAAA, 2019). Importantly, there are few, if any, efforts designed to evaluate and track unique symptom patterns of alcohol misuse in older adult samples. Since alcohol use continues to be a common occurrence later in life (Menninger, 2002; Moore et al., 2011; SAMHSA, 2019; SAMHSA & AoA, 2012), appropriate measures need to be developed for older adult populations. Yet, researchers have yet to construct and validate a measure for alcohol use within this population. Despite this need, there is a general practice to rely upon assessment instruments specifically designed for different developmental populations (APA, 2014).

Another major concern regarding best practices in evaluating alcohol misuse symptoms specific to older adult populations is the over-reliance on screening instruments. Screening measures are effective in identifying basic risk factors to a debilitative outcome and in determining when further assessment is necessary (Kazdin, 2003). However, there is often a misunderstanding surrounding the use of screeners, notably, they do not provide detailed information needed to make a proper diagnosis and infer treatment planning and decision-making (Informed Health, 2013; SAMHSA, 2020b). Although screening measures can easily detect a problem quickly and at low cost, perhaps before symptoms have fully developed, this only becomes helpful if there is an efficacious intervention to treat the problem (Informed Health, 2013). Further assessments are necessary when screening results are more severe as assessments can better determine how outcomes, like alcohol misuse, are distinguished or

intersect with other problem areas (e.g., physical health conditions, general aging factors; SAMHSA, 2020b). In summation, an overreliance on screeners may negatively impact the field's understanding alcohol misuse, especially if the screener is missing developmentally important factors (SAMHSA, 2020b).

In combination, the lack of developmentally salient measures and the over-use of screeners is especially concerning in linking research to treatment considerations (SAMHSA, 2020b). Specifically, how can practitioners frame and implement effective treatment when the current literature fails to fully account (e.g., use of a screener) for age-related salient symptoms (e.g., use of a developmentally inappropriate measure)? As such, it would be beneficial to construct interventions using data from comprehensive measures extensively and uniquely accounting for important symptoms, outcomes, consequences, or facets of substance use in older adults. To this end, it is important for researchers to evaluate the limits of current measurement tools to determine how an appropriate and comprehensive alcohol misuse assessments can be constructed and validated.

The Michigan Alcoholism Screening Instrument – Geriatric Version (MAST-G) is designed for use with older adult populations. However, it is meant to be used for screening purposes. The MAST-G is a 25-item questionnaire designed to quickly screen and detect "at-risk" alcohol use for older adults (Blow et al., 1992). Because of the time it takes to complete 25 items, the developers of the MAST-G decided to construct and validate a short form (Blow et al., 1992). Notably, in recent years, the SMAST-G is the preferred version after reducing the MAST-G to ten yes-no items that assess for physical signs of alcohol misuse, emotional concerns attributed by alcohol use, behavioral problems of controlling or limiting use, and reactions of others about the older adult's use (Naegle, 2008). While this version quickly captures "at risk"

alcohol use, it fails to assess for the quantity, frequency, and duration of use (Naegle, 2008).

Additionally, the yes-no scale oversimplifies responses and is too constricting to allow for any

variation in experience which can be critical for conceptualizing and developing treatment plans.

Moreover, the scale can lead to respondents answering inaccurately since a yes-no item does not

provide an opportunity to fully capture their thoughts and emotions associated with a particular

question, or it does not allow for self-differentiation over time (Kazdin, 2003).

Another commonly implemented measure to estimate variation of alcohol misuse

symptoms in older adult populations is the Alcohol Use Disorders Identification Test (AUDIT).

The AUDIT is designed for the general adult population and is considered to be highly suitable

for patients in primary care, hospitals, and other healthcare settings (NIAAA, 2000; World

Health Organization [WHO], 2001). However, the AUDIT was not originally developed to

address unique behaviors, motivations, and attitudes toward alcohol use in older adults (WHO,

2001). It consists of ten Likert-scale items measuring the frequency of problematic use and the

frequency of risky or hazardous drinking-related behaviors (WHO, 2001; NIAAA, 2000). It does

not capture important negative social and health consequences of alcohol use. The AUDIT is

commonly used in research and epidemiological studies to enhance the field's understanding of

causes, outcomes, and general tracking related to alcohol misuse (NIAAA, 2000), though, the

vast majority of validation studies did not include equitable representation of older adult

populations (WHO, 2001). These limitations interfere with our ability to draw out complete and

unique patterns and trends with alcohol misuse in older adult populations. Thus, continued use of

the AUDIT with older adult samples may hinder our ability to develop effective theoretical

research and treatment programs specific to individuals in this unique developmental timeframe.

A comprehensive tool can more narrowly establish how alcohol use is a problem, and in turn,

identified problem areas from the comprehensive tool can be used as a basis for conceptualization and intervention. Literature indicates older adults may need more extensive assessment procedures; however, there appears to be no clear direction regarding the development and validation of more extensive assessment procedures (SAMHSA, 2020b).

The Addiction Severity Index (ASI) is another measure used to evaluate alcohol misuse in older adults. It is a comprehensive 200-item assessment tool used to assess an adult's condition on seven problem areas: alcohol use, drug use, employment and support, family/social status, legal status, medical status, and psychiatric status (McLellan et al., 1980). The ASI's primary goal is to provide an outcome evaluation of clients who are struggling with addiction and aid in developing a substance abuse treatment plan (McLellan et al., 1980). This measure was not specifically designed to capture unique experiences and components of older adulthood and is commonly and oversimply transferred to largely differing population (Jemberie et al., 2020), likely because of the lack of developmentally appropriate assessments.

The Substance Abuse Subtle Screening Inventory, 4th edition (SASSI-4) is also used to measure alcohol misuse in older adult populations. The SASSI-4 is another comprehensive assessment originally designed for use with adolescents and middle-aged adults. Notably, the purpose of this measure is to help identify and distinguish the presence for substance use disorders from one another and from other psychological disorders (Miller, 1999). Importantly, it measures individuals' defensiveness toward problematic use, insight of symptoms and concerns, willingness to acknowledge use as a substance use disorder, evidence of emotional pain, and risk of legal issues (Miller, 1999, SASSI Institute, 2018). However, similar to the ASI, the SASSI-4 is designed for all types of substances for younger population groups (18+; Miller, 1999, SASSI

Institute, 2018) rather than investigating problematic alcohol use and its unique developmental

outcomes for older adults (65+).

In review, it is important to address noted limitations in currently used measures to frame

new, more comprehensive, and age-related responsive assessments for alcohol misuse in older

adult populations. First, while screening measures can be initially important in recognizing if a

problem is present or not, it limits the opportunity to extensively evaluate how various factors or

outcomes can be relevant to an older adult. Second, current comprehensive measures were

originally developed for younger populations and were extended to older adults without

incorporating additional components that are unique to older adulthood (e.g., loss, changes in

health). Missing these unique areas causes concern for the soundness of previous research using

alcohol use measures for older adults, but also about the impediment of constructing further

theory in how constructs are connected and understood. A measure is needed to develop theory

in how substance use is connected to older adults or related constructs (e.g., depression, social

support, health), acquire implications from said theory, and inform treatment decisions.

Points of Convergent Validity

When developing a measure, it is important to analyze how a construct relates, or does

not relate, to other relevant constructs. Depression, social support, and general health concerns

are three areas that are supported by research to have theoretical and clinical relevance to alcohol

use, especially in older adult populations as compared to other age groups, and these areas are

emphasized to be assessed when alcohol misuse is present (SAMHSA, 2020b; Satre et al., 2012).

Depression. Research supports a strong link between depression and alcohol use. As

compared to individuals who do not drink alcohol problematically, individuals with an alcohol

use disorder are twice as likely and individuals at a sub-clinical level are 1.5 times as likely to

have a mood disorder (Edwards et al., 2014). Regarding older adult populations specifically,

depression is one of the most common comorbid diagnoses alongside alcohol use disorder

(SAMHSA, 2020b). Specifically, about 4.5% of older adults who are diagnosed with alcohol use

disorder also meet criteria for Major Depressive Disorder (Center for Behavioral Health

Statistics and Quality, 2020). Researchers argue this rate would be even higher if other

depressive disorders or depressive symptoms were included. Therefore, research suggests it is

imperative to assess for depression if alcohol misuse is present, especially for older adult

populations as compared to other age groups (SAMHSA, 2020b; Satre et al., 2012).

Additionally, individuals with depression are likely to turn to alcohol use as a coping strategy to

alleviate significant depressive symptoms (Brennan & Soohoo, 2013; Kelly et al., 2018;

SAMHSA, 2020b). Moreover, the physiological effects of persistent alcohol use are also linked

to depression due to its ability to cause a chemical imbalance in the brain (Ramsey, Engler, &

Stein, 2005). Alcohol use can also indirectly increase depression symptoms because of its

potential to produce adverse long-term consequences of psychosocial functioning, impede

treatment seeking behaviors or treatment progress, and hinder usage of more adaptive coping

strategies (Ramsey, Engler, & Stein, 2005). As a result, alcohol misuse and depression fall under

a vicious cycle each persistently sustain or escalate one another. Given these strong links, any

measure of alcohol misuse should be highly related to depression (or low mood) with older adult

samples.

Social Support. Research highlights several social support factors associated with

drinking behaviors later in life. Social support is a robust protective factor against alcohol misuse

(Stone et al., 2012), and it is often incorporated in many treatment strategies to reduce

problematic drinking behaviors (Kelly et al., 2018; Steinhagen & Friedman, 2008). A lack of

social support is a large contributor for sustained alcohol misuse and can lead to relapse during treatment processes (Brooks et al., 2017). However, while social support is often estimated in quantity and breadth of social networks by younger adult populations, socioemotional selectivity theory (SST) suggests older adults tend to shift their estimations to quality of social support rather than quantity (Carstensen, 1991; Löckenhoff & Carstensen, 2004). Thus, older adults are more likely to have a smaller social network base as compared to younger adults.

Despite developmental changes in networking scopes and lens, perceptions relative to lack of social support are extremely important in exploring the motivations behind engaging in alcohol use within the population (Lee et al., 2020). Sometimes major milestones in older adulthood can impede perceptions of social support from close friend networks. For instance, older adults retire and lose opportunities in spending time with work-based peers during their day-to-day duties, and therefore, perceive less social support resources are available to them (Bamberger, 2015). Additionally, individuals who perceptually lose support via separation or divorce are more likely to drink problematically as compared to individuals who report strong marital connections (Merrick et al., 2008; Stahl & Schulz, 2014). Moreover, individuals who perceive lower levels of support due to mortality of age-group peers may turn to alcohol use as a method of coping (Kelly et al., 2018; Kuerbis et al., 2014). While decreasing support metrics can be a cause of alcohol misuse, it can also be an outcome. For example, individuals who drink problematically may decrease time spent with others, impair self-social functioning, and damage interpersonal and social roles and relations in a way that minimizes perceived levels of support (Lee et al., 2020). Taking these unique findings into consideration, it is important for any developed measure of alcohol misuse to evaluate perceptions of social support, especially among

older adult samples, given older adults' decreased access to social support and differences in how they value and perceive social support.

However, it is important to highlight how social support needs differ for older adults as compared to younger adults. A primary goal for older adults is to achieve emotional satisfaction when experiencing distress (Jiang, Drolet, & Kim, 2018). To achieve emotional satisfaction, older adults tend to rely on more implicit social support seeking and use less explicit social support seeking as younger adults (Jiang, Drolet, & Kim, 2018). In other words, older adults prefer to spend time with others without discussing their distress because of being more concerned about potential costs and having increased concern of not wanting to bother others (Jiang, Drolet, & Kim, 2018). Thus, it may be most beneficial to assess for implicit social support seeking rather than explicit social support.

General Health Outcomes. General health is another area strongly associated with alcohol misuse, especially for older adult populations. Specifically, older adult bodies are more vulnerable to the effects of alcohol due to decreased body mass, the liver's diminished efficiency to break down alcohol, and higher permeability of the blood-brain barrier (Kennedy et al., 1999). These bodily changes can significantly impair physical functioning and lead to higher risk of physical and mental health concerns for older adults, even if older adults are drinking at a generally considered nonproblematic level (Kuerbis et al., 2014; Steinhagen & Friedman, 2008). Additionally, older adult individuals who are diagnosed with alcohol use disorder are more likely to have sleep problems and experience greater risk for cognitive impairment or dementia than undiagnosed older adults (Kuerbis et al., 2014; Thomas & Rockwood, 2001). Other health indicators of substance misuse in older adult populations may include falling injuries (e.g., bruises, burns), poor hygiene and self-care, headaches, incontinence, poor nutrition, and chronic

pain (Barry, Blow, & Oslin, 2002; Dar, 2006). Chronic use can result in more severe health conditions, such as stroke, cancer, or blood- and organ-related diseases (Poli et al., 2013). Research suggests individuals who experience these concerns often turn to alcohol use as a method of coping with and alleviating adverse symptoms (Kelly et al., 2018; Kuerbis et al, 2014). In addition, given the rise of medical concerns in older adulthood, the number of prescriptions and medications are also increasing (Kennedy et al., 1999; Kuerbis et al., 2014). This becomes problematic alongside alcohol misuse as a wide array of harmful drug interactions can occur, and considerably more for older adult populations, due to their bodies being more vulnerable to the effects of drug ingredients (Kuerbis et al., 2014). Considering these patterns, any developed measure of alcohol misuse for older adults should possess strong associations with general health concerns.

Alcohol Misuse and Rurality

When assessing for variation in alcohol misuse, it is also important to evaluate individuals' geographic setting. Research suggests level of alcohol use can vary depending on urban versus rural status (Dixon & Chartier, 2016; Friesen et al., 2021). While definitions and criteria for rurality can vary, a rural setting is generally defined as an area outside of a metropolitan and micropolitan area that consist of less than 2,500 to 10,000 residents (Friesen et al., 2021). Individuals living in rural settings are at an elevated risk of hazardous and harmful alcohol use (Dixon & Chartier, 2016; Friesen et al., 2021). For instance, rural residents are significantly more likely to exceed daily drinking limits as compared to urban residents (Dixon & Chartier, 2016). Additionally, older adults are proportionally more likely to be residing in rural areas compared to other age groups (Smith & Trevelyan, 2019). Specifically, about 18% of rural populations are older adults whereas about 14% of urban populations are older adults

(Smith & Trevelyan, 2019). Thus, evaluating alcohol use in older adults based on geographic setting is imperative, especially since rural drinking trends are worsening over time (Friesen et al., 2021).

Current Study

The primary purpose of the current study was to develop and psychometrically validate a comprehensive measure of alcohol misuse appropriate for older adult populations. In completing this goal, I followed the guidelines offered by Clark and Watson (2019). Particularly, I, with the aid of my dissertation chair, developed a lengthy list of items based on a theoretical and empirical understanding of the unique features, outcomes, and experiences that are more likely to be experienced with alcohol misuse in older adult populations. This original list of items was evaluated for grammar/sentence structure, double-barreled content, developmental saliency, and overlapping content with other items. Ill-fitted items were removed from the item pool. The remaining items were evaluated by seven colleagues with regard to content fit, developmental saliency, and content clarity using a numeric scale. Only items rated at the 80% for fit were kept in the final list of items. Once the final pool of items was constructed, I evaluated them empirically using a three-study method. The first study was developed to explore the factorial structure of the measure (e.g., unidimensional, multidimensional, hierarchical, bi-factorial). The next study was implemented to confirm the factor structure established the first study. Finally, the third study was implemented to evaluate convergent validity for the established measure.

Hypotheses. Three hypotheses and one exploratory inquiry were proposed. First, I expected items would hold together in an internally consistent manner ($\alpha > .70$). Next, I hypothesized that there would be a clear multidimensional factor structure associated with the evaluation of the items as alcohol use can have behavioral, psychosocial, and health-related

effects. Moreover, based on current established research, I hypothesized that these factors would be positively related to depression and health concerns and inversely related to social support. Lastly, I sought to determine if alcohol misuse factors in older adult populations vary as a function of gender and rural status.

CHAPTER 2: METHODOLOGY STUDY 1

Participants

Participants for the current study included adults 55 years of age or older. The criteria of 55 years of age were chosen because of how Amazon's Mechanical Turk (MTurk) classifies age. I was unable to request information exclusively from participants who were at least 65 years of age. A total of 412 older adults were recruited through MTurk to ensure sufficient statistical power. The recruitment process of MTurk was expected to gather representative data from individuals who identify with the following ethnic identities: White/European American, Black/African-American, Asian/Asian-American, Mexican American/Latino/a, American Indian/Native American, and multi-ethnic. Upon completion of the current study, participants received monetary compensation of one US dollar.

Although 412 participants initially responded, 112 participants were excluded for not meeting basic and validity criteria. Specifically, participants were expected to meet the minimum age criteria of 55 years of age, provide consent, give themselves adequate time to answer questions (non-speeding), and complete at least 70% of survey items. Of the 112 excluded participants, 55 (49%) did not meet the age requirement, 10 (9%) did not provide direct consent, and 69 (61%) did not complete 70% of the survey items. Some participants were excluded for multiple violations. Therefore, the total sample for the analyses was 300 participants with an average age of 67.23 years ($SD = 4.23$). The age range of the sample was between 55 and 85 years. See Table 1 for demographic information.

Table 1. Socio-demographic Characteristics of the Sample, Data Set 1

Demographic Variables	*n* (%)
Gender Identity	
Cisgender Man	120 (40%)
Cisgender Woman	180 (60%)
Intersex	0 (0%)
Genderqueer or nonbinary	0 (0%)
Race/Ethnicity	
White/Caucasian	280 (93.3%)
Black/African American	10 (3.3%)
Asian/Asian American	3 (1%)
Mexican American/Latino/a	4 (1.3%)
American Indian/Native American	0 (0%)
Multiracial	2 (0.7%)
Other	1 (0.3%)
Education	
Less than high school	0 (0%)
Some high school	1 (0.3%)
High school diploma or GED	18 (6%)
Some college or vocational school	41 (13.7%)
Vocational degree or certificate	11 (3.7%)
College degree	142 (47.3%)
Master's degree	80 (26.7%)
Doctoral degree	7 (2.3%)
Employment Status	
Employed for wages	126 (42%)
Self-employed	52 (17.3%)
Out of work & looking for work	3 (1%)
Out of work & not looking for work	1 (0.3%)
Homemaker	3 (1%)
Student	0 (0%)
Military	0 (0%)
Retired	110 (36.7%)
Unable to work	5 (1.7%)
Financial Resources	
Poor/Impoverished	16 (5.3%)
Some financial resources	199 (66.3%)
Substantial financial resources	74 (24.7%)
Affluent/Rich	11 (3.7%)
Rural Status	
Rural	119 (39.7%)
Non-Rural	181 (60.3%)
Marital Status	
Single	21 (7%)
Married/Partnered/Common Law	209 (69.7%)
Separated	2 (0.7%)

	Divorced	44 (14.7%)
	Widowed	24 (8%)
Access to Health Services		
	Very poor	2 (0.7%)
	Poor	10 (3.3%)
	Acceptable	77 (25.7%)
	Good	115 (38.3%)
	Very good	96 (32%)
Past Mental Health Services		
	Yes	149 (49.7%)
	No	151 (50.3%)
Past Subs. Use Treatment		
	Yes	86 (28.7%)
	No	214 (71.3%)

Measures

Demographic Survey. Demographic questions were included to obtain information pertaining to participants' age, sex, gender, race and ethnicity, marital status, highest level of education, employment status, socioeconomic status, and participation in prior health services or treatment. Additionally, there were multiple questions assessing for rurality. Specifically, participants were invited to describe their hometown as rural or non-rural, share their zip code, and rate their accessibility to health-related services and resources in their community. However, it is important to note that many participants did not accurately report their zip code. For instance, some individuals reported area code instead and others completely ignored the prompt. Therefore, zip codes could not be used to delineate rural versus non-rural groups.

Alcohol Misuse Scale for Older Adults. The items in the proposed measure were developed to assess levels of current alcohol misuse for older adults. The items were developed by Nathan Jensen and Jeff Klibert. Nathan Jensen began the process of reviewing current literature for studies that highlighted differences in attitudes, behaviors, and effects for alcohol

use among older adults as compared to younger adult populations, as well as finding studies

applying this knowledge to the development of alcohol use screening tools for older adults

(APA, 2013; Kuerbis et al., 2014; NIAAA, 2019; SAMHSA, 2020b; Stahl & Schulz, 2014;

Steinhagen & Friedman, 2008). Originally, 14 items were created to assess for diagnostic criteria

of alcohol use disorder. Upon further review of the literature, 46 items were added to capture and

further adapt alcohol use dynamics associated with older adults. A high number of items were

generated since survey development standards indicate a greater number of items are better to

find good fit statistics (Johnson & Morgan, 2016). All 60 items were evaluated by seven

individuals with at least a master's degree and experience assessing and treating substance use

disorders. They were requested to examine the items for clarity and level of fit (1 = does not fit,

2 = somewhat fits, 3 = fits well) with the construct. Fit is defined by consistency between item

content and larger definition of alcohol use difficulties noted through clinical practice, as well as

overall readability of the items. All items were deemed good fit with the defined construct. Each

item is measured on a scale from 1 (never or not related) to 5 (always). See Appendix 1 for a full

list of items.

Procedure

Participants in the current study were recruited through the MTurk system, which

outsources virtual jobs and tasks for US adults who receive monetary compensation. As part of

the MTurk system, potential participants review lists of studies they are interested participating

in via the MTurk interface. Individuals with interest in my study were directed to a brief study

description. If individuals wished to participate, they were invited to click on a link to a Qualtrics

survey. The Qualtrics link introduced the study to participants in depth via an informed consent

form. To participate, individuals were required to provide passive informed consent by checking

a box noting their willingness to participate. After completing the passive informed consent procedures, participants were directed to the administration of the survey where they responded to demographic questions and the developed alcohol misuse questionnaire. Participants took about 10 minutes to complete the surveys. Upon completion, they were thanked for their participation and given compensation. Identifying information was not collected within this study to ensure anonymity. Each participant received approximately $1 per hour through the MTurk website as compensation for their time.

Analytic Plan

To determine the factor structure of the measure and evaluate any relationships between identified factors, a maximum likelihood exploratory factor analysis (EFA) was conducted. Researchers offer a range of adequate sample sizes when conducting an EFA. Some suggest a minimum of 100 participants (Gorsuch, 1983; Kline, 1994), whereas others indicate 300 participants represents a "good" sample size (Comrey and Lee, 1992). Still others propose a sample size equating to three times the number of total items in the scale (Cattell, 1978). Given this disparity, I aimed to recruit at least 300 participants. More than one factor was identified so an oblique rotation strategy (Promax) was utilized to increase the interpretability of the data. In evaluating the EFA, I investigated the Kaiser-Meyer-Olkin (KMO) and Bartlett's Test for Sphericity to determine if the data were adequate to run factor analytic procedures. Data adequacy was determined by a score of .90 on the KMO test and a significant p-value on Bartlett's Test for Sphericity.

An examination of eigenvalues was completed to determine the number of significant factors within the model. Factors were included in the final model if they possessed an eigenvalue score of 1 or above. Scree plots were created to depict the factor level distribution

based on eigenvalues. The combined effect for all included factors should account for at least 60% of the variance of alcohol misuse.

Within the EFA procedures, I evaluated cross-loadings to ensure all items loaded onto a single factor. Items with cross-loading were removed from the final model. Factor loading scores were only be kept in the model if they exceeded .50. I also evaluated the items' communalities, or the extent to which specific items shared variance with other items included in the pool. Items with communality scores of .30 and below were removed from the final model. The average strength of the interrelationships among the items in each factor equated to or exceeded .70.

Additionally, I investigated violations of normalcy by examining metrics associated with skewness and kurtosis. This was completed by examining the KMO test of normality which detects violations of the normal distribution. Histograms were constructed to depict what the distribution of scores look like for each identified factor. In addition, internal consistency for each identified factor was evaluated by examining coefficient alpha. Alpha coefficients of .70 and above were deemed as acceptable while coefficients of .90 and above were deemed as exceptional. Finally, I evaluated rural and gender differences on participant's reports of alcohol misuse factors, as identified by the EFA. To determine if gender and rural differences were present, a MANOVA was conducted.

CHAPTER 3: RESULTS STUDY 1

Feasibility of Data

To evaluate the dispersion of items within the constructed measure into distinct factors, a series of EFAs was conducted. The first EFA included all 60 items. KMO and Bartlett's Test of Sphericity were initially analyzed to determine the adequacy of the data to run an EFA. Promax, a robust rotation strategy that creates evident, delineating lines for factor rotation, was chosen since correlations were expected across any identified factors. A factor loading threshold for inclusion was set at 0.5 and above (Stevens, 2012). Smaller coefficients with values less than 0.3 were suppressed.

Exploratory Factor Analyses

In examining KMO and Bartlett's Test of Sphericity, data seemed appropriate to be analyzed through an EFA (*KMO* = 0.98; *Bartlett's Test, p* < .05; Hutcheson & Sofroniou, 1999). The initial EFA produced two factors, however 21 items (1, 3, 6, 8, 9, 11, 13, 15, 17, 21, 23, 26, 27, 32, 34, 40, 49, 50, 54, 57, 59) were cross loaded. I removed these items from the model. After removing the cross loaded items within the first EFA, the second EFA also produced two factors. Although, another five items (28, 33, 37, 41, 53) needed to be removed from the EFA model due to cross loadings. After running a third EFA without cross loaded items, two factors were generated. The remaining items produced adequate factor loading scores ($\geq$ .5) without cross loadings. Of the 60 items that were initially evaluated, 34 items were upheld in the final model (see Appendix 2 for final list of items).

The retained items loaded on two distinct factors (see Figure 1). These factors were significant because they maintain high eigenvalue levels (over 1).

Figure 1. Scree Plot for the Final Exploratory Factor Analysis Model
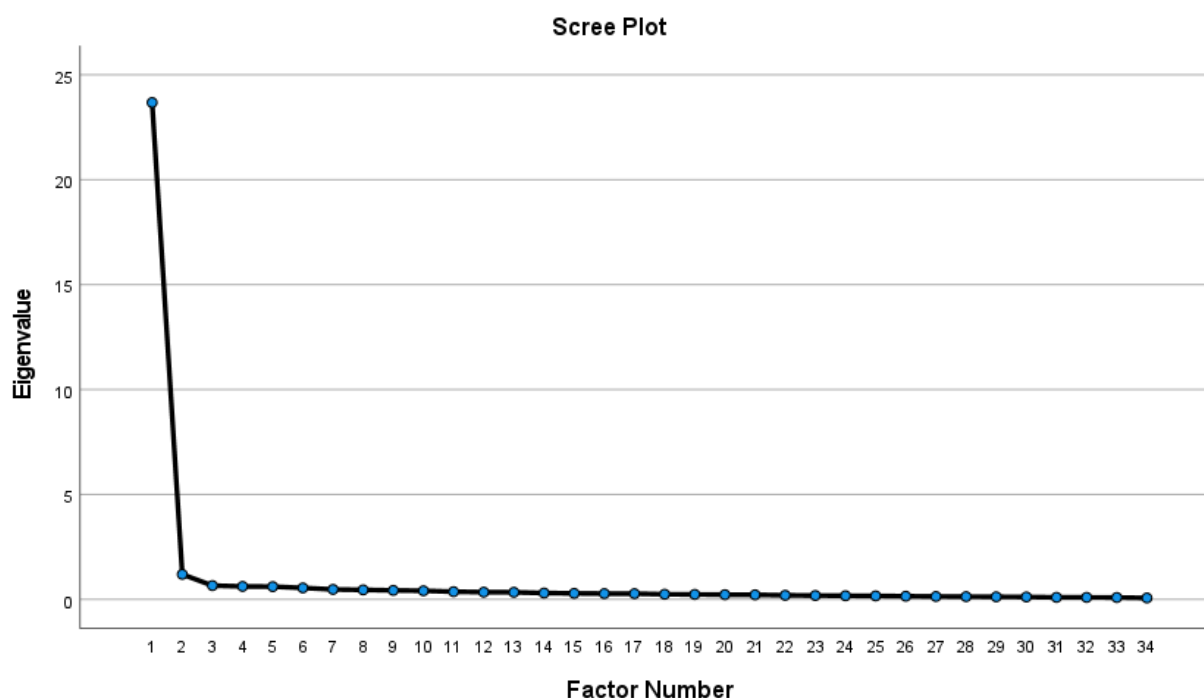
The retained items accounted for 71.41% of the total variance in the latent construct (see Table 2). The total variance explained is consistent with metrics indicating the items captured significant features of the latent construct.

Table 2. Regression Statistics Total Variance Explained by the Identified Factors

Factor	Initial Eigenvalues			Extraction Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	23.680	69.648	69.648	23.379	68.763	68.763
2	1.197	3.519	73.167	.902	2.654	71.416

The communalities of the retained items are displayed in Table 3. The communalities were consistent with field expectations for inclusion into the final model.

Table 3. Communalities of Retained Items

Item #	Initial	Extraction
Item 2	.638	.607
Item 4	.698	.611
Item 5	.676	.656
Item 7	.785	.703
Item 10	.712	.682
Item 12	.854	.828
Item 14	.779	.745
Item 16	.816	.758
Item 18	.815	.768
Item 19	.633	.544
Item 20	.841	.793
Item 22	.686	.630
Item 24	.845	.783
Item 25	.776	.719
Item 29	.825	.756
Item 30	.525	.475
Item 31	.768	.719
Item 35	.828	.780
Item 36	.676	.638
Item 38	.760	.691
Item 39	.789	.715
Item 42	.819	.780
Item 43	.786	.731
Item 44	.833	.788
Item 45	.772	.727
Item 46	.808	.743
Item 47	.836	.773
Item 48	.799	.751
Item 51	.822	.763
Item 52	.822	.736
Item 55	.657	.603
Item 56	.779	.722
Item 58	.789	.706
Item 60	.874	.857

Factor one contained 23 items (4, 7, 12, 16, 18, 20, 24, 25, 29, 31, 35, 38, 42, 43, 44, 45, 46, 47, 48, 51, 52, 58, 60). Factor two contained 11 items (2, 5, 10, 14, 19, 22, 30, 36, 39, 55, 56). Factor loading scores for each item are shown in Table 4. Each factor demonstrated a strong

fit to the overarching latent construct since the average factor loading fell above 0.7. As

expected, the two factors were strongly correlated with one another ($r = .83$).

Table 4. *Factor Loadings of Retained Items*

Item #	Factor 1	Factor 2
Item 60	.931	--
Item 38	.887	--
Item 12	.881	--
Item 42	.868	--
Item 44	.829	--
Item 45	.801	--
Item 51	.772	--
Item 47	.751	--
Item 18	.741	--
Item 35	.735	--
Item 48	.726	--
Item 31	.726	--
Item 20	.723	--
Item 29	.718	--
Item 52	.713	--
Item 4	.695	--
Item 46	.695	--
Item 25	.670	--
Item 43	.668	--
Item 24	.636	--
Item 16	.624	--
Item 7	.619	--
Item 58	.594	--
Item 14	--	.888
Item 5	--	.826
Item 39	--	.736
Item 36	--	.692
Item 2	--	.678
Item 10	--	.672
Item 55	--	.646
Item 56	--	.637
Item 22	--	.563
Item 19	--	.560
Item 30	--	.510

The first factor was associated with several themed clusters, including difficulty in relationships, difficulty attending to responsibilities, difficulty attending appointments or other health-related services, experiences with injuries from drinking, along with experiences of headaches, sweating, discomfort, or sickness from not drinking. Some examples of items in this factor include: *"I had trouble attending healthcare appointments because of my drinking," "I received bruises or scratches as a result of drinking" "I spent less time with my romantic partner in order to drink," "I experienced difficulties sweating after a period of not drinking,"* and *"I experienced physical discomfort when I tried to stop drinking."* Thus, the label Adverse Outcomes was used to portray this factor given its item content.

The second factor's items captured areas related to overdrinking behaviors, experiencing an urge to drink, as well as the intention for drinking and how alcohol is being used as a coping strategy. Examples of items within this factor include the following: *"I intended to get drunk when drinking," "I drank excessively (3 or more alcoholic beverages per sitting)," "I drank to decrease sadness," "I felt a strong urge or desire to drink alcohol," "I drank to decrease feelings of worry,"* and *"I felt it was easier to drink than to manage my emotions."* Given the content in this factor, the label Drinking Intention was used to characterize this factor.

Internal Consistency Scores of Factors

Internal consistency was assessed after analyzing and labeling both factors. The internal consistency was strong for Adverse Outcomes ($\alpha = .99$) and Drinking Intention ($\alpha = .95$). Overall, the scores demonstrate that the items effectively hold together for both identified factors.

Normalcy of Factors

        The data were examined to evaluate the distribution of scores for the Adverse Outcomes

factor ($M = 55.93$, $SE = 2.20$). The skewness of the data was .56 with a standard error of .14, and

the kurtosis was -1.44 with a standard error of .28. The Kolmogorov-Smirnov test was analyzed

to evaluate if these effects violated the normal distribution. The results were significant, $D(300)$

$= .27$, $p < .01$, indicating the data are non-normally distributed. Specifically, the Adverse

Outcomes scores display a positively skewed pattern as shown in the histogram (see Figure 2).

Figure 2. Normal Distribution for Factor 1 (Adverse Outcomes), Data Set 1
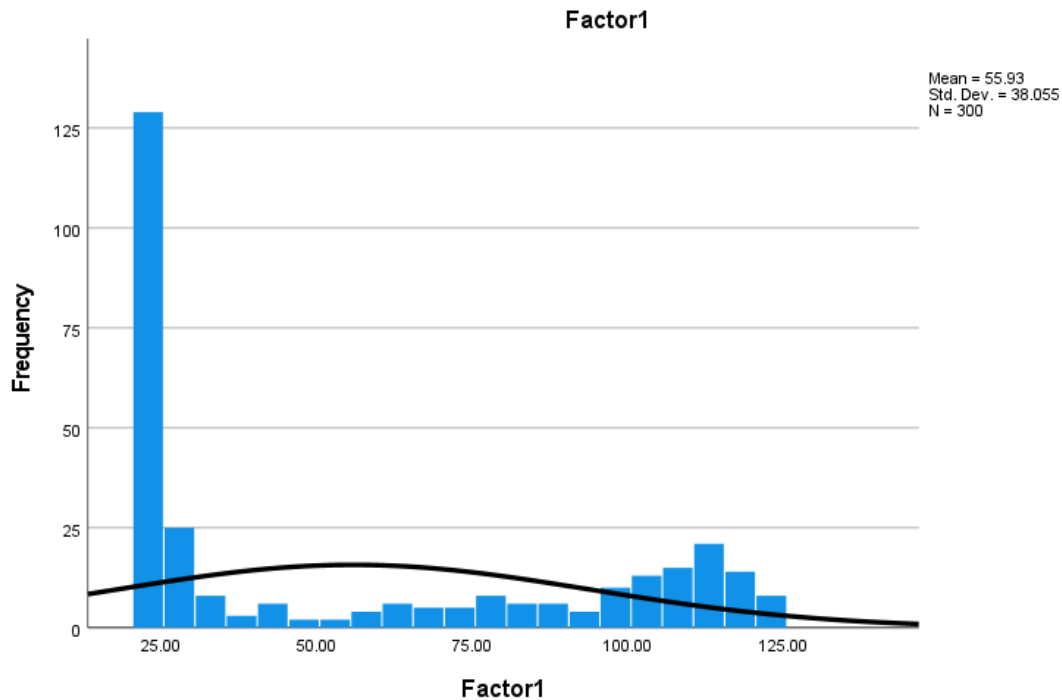
The same procedures were used to analyze the normal distribution for the Drinking Intention factor ($M = 30.54$, $SE = 1.02$). The skewness of the data was .23 with a standard error of .14, and the kurtosis was -1.54 with a standard error of .28. The Kolmogorov-Smirnov test was again analyzed to evaluate if these effects violated the normal distribution. These results were also significant, $D(300) = .17$, $p < .01$, indicating the data are non-normally distributed. Specifically, the Drinking Intention scores display a positively skewed pattern as shown in the histogram (see Figure 3).

Figure 3. Normal Distribution for Factor 2 (Drinking Intention), Data Set 1
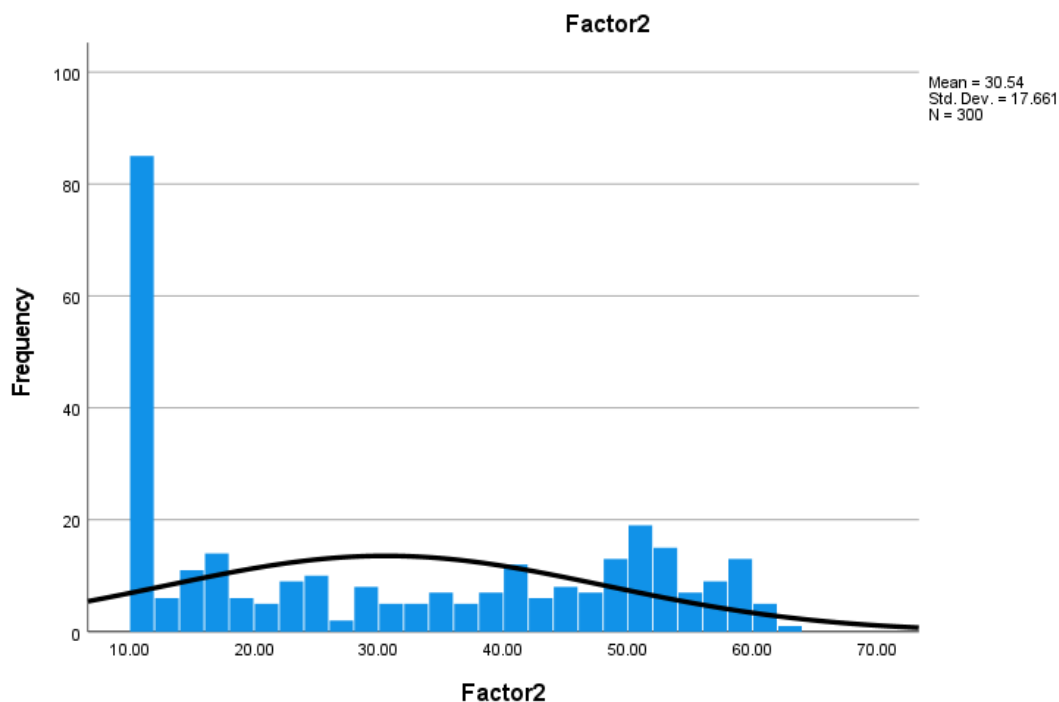
Mean Differences

A 2 (gender) x 2 (rurality) Factorial MANVOA was conducted to determine if gender and rurality differences were reported on the identified alcohol misuse factor scores. Gender and rurality were both divided into two groups based on self-reported labels. For gender, there were 120 cisgender men and 180 cisgender women. No participants identified as gender non-binary or genderqueer. For rurality, 181 participants identified living in a rural hometown and 109 participants identified living in a non-rural hometown.

The means and standard deviations for gender and rurality on the two alcohol misuse factors are reported in Table 5. Results did not reveal a multivariate main effect for gender, $\lambda = .99$, $F(2, 295) = .55$, $p = .58$, $\eta_p^2 < .01$, or for rurality, $\lambda = .99$, $F(2, 295) = .103$, $p = .90$, $\eta_p^2 < .01$. Moreover, there was a non-significant interaction effect, $\lambda = .99$, $F(2, 295) = .82$, $p = .44$, $\eta_p^2 < .01$.

Although no significant multivariate differences were found between gender and rurality on alcohol misuse factor scores, ANOVAs were still conducted to explore mean differences between groups at a univariate level. Regarding Adverse Outcomes, results detected a non-significant main effect for gender, $F(1,296) = .83$, $p > .05$, $\eta_p^2 < .01$, a non-significant main effect for rurality, $F(1,296) = .18$, $p > .05$, $\eta_p^2 < .01$, and a non-significant interaction effect between gender and rurality, $F(1,296) = 1.49$, $p > .05$, $\eta_p^2 < .01$. Specifically, older adults identifying as cisgender men ($M = 57.76$, $SD = 37.17$) reported comparable Adverse Outcome scores compared to older adults identifying as cisgender women ($M = 54.71$, $SD = 38.69$). Moreover, older adults residing in a rural area ($M = 56.45$, $SD = 39.42$) reported comparable Adverse Outcome scores to older adults residing in non-rural areas ($M = 55.59$, $SD = 37.23$).

For Drinking Intention, results detected a non-significant main effect for gender, $F(1,296) = .33$, $p > .05$, $\eta_p^2 < .01$, a non-significant main effect for rurality, $F(1,296) = .10$, $p > .05$, $\eta_p^2 < .01$, and a non-significant interaction effect between gender and rurality, $F(1,296) = .83$, $p > .05$, $\eta_p^2 < .01$. Specifically, older adults identifying as cisgender men ($M = 31.04$, $SD = 17.59$) reported comparable Drinking Intention scores compared to older adults identifying as cisgender women ($M = 30.21$, $SD = 17.75$). Moreover, older adults residing in a rural area ($M = 30.71$, $SD = 18.19$) reported comparable Drinking Intention scores to older adults residing in non-rural areas ($M = 30.43$, $SD = 17.36$).

Table 5. Means and Standard Deviations by Gender Identity and Rurality, Data Set 1

| | | Gender Identity | |
		Women ($n = 180$)	Men ($n = 120$)
Adverse Outcomes			
Rural ($n = 119$)			
	Mean	52.51	62.29
	SD	38.56	40.36
	n	71	48
Non-Rural ($n = 181$)			
	Mean	56.15	54.74
	SD	38.88	34.85
	n	109	72
Drinking Intention			
Rural ($n = 119$)			
	Mean	29.44	32.60
	SD	17.49	19.20
	n	71	48
Non-Rural ($n = 181$)			
	Mean	30.72	30.00
	SD	17.98	16.49
	n	109	72

CHAPTER 4: METHODOLOGY STUDY 2

Participants

Participants for the current study included adults 55 years of age or older. A total of 402 older adults were recruited through Amazon's Mechanical Turk (MTurk) and Forthright to ensure sufficient statistical power. Importantly, I had trouble recruiting the necessary sample size from MTurk. Thus, I contracted with Forthright to panel the remainder of needed older adult participants. The recruitment process was expected to gather representative data from individuals who identify with the following ethnic identities: White/European American, Black/African-American, Asian/Asian-American, Mexican American/Latino/a, American Indian/Native American, and multi-ethnic. Upon completion of the current study, participants received monetary compensation consistent with the recommendations offered by both paneling services (MTurk and Forthright).

Four hundred and two participants initially responded to the invitation to complete the surveys. Of these participants, 104 (25.9%) were recruited through MTurk and 298 (74.1%) were recruited through Forthright. Regarding validity checks, 57 participants were excluded for not meeting basic and validity criteria. Participants were expected to meet the minimum age criteria of 55 years of age, provide direct consent, give themselves adequate time to answer questions (non-speeding), answer the check question correctly, and complete at least 70% of survey items. In addition, in the data I noted quick completion times, therefore, I also checked the data for speeders. Of the 57 excluded participants, 57 (100%) were removed for failing to answer the check question correctly and 17 (29%) individuals sped (spending less than 2 seconds per question; Bassili & Fletcher, 1991) through the survey items. All participants who engaged in speeding also failed to answer the check question correctly. Therefore, the new total sample for

this study was 345 participants with an average age of 69.15 years ($SD = 5.21$). The age range of the sample was between 55 and 96 years. See Table 6 for Demographic information.

Measures

The measures that were administered during Study 2 were identical to the measures administered in Study 1 (see Chapter 2).

Procedure

The procedures that were adhered to in Study 2 were identical to the procedures of Study 1 (see Chapter 2). However, we also used Forthright, an independent marketing firm specializing in paneling services to collect additional data. Data collection for Forthright operates similarly as MTurk. All participants gathered through Forthright were compensated by the paneling service itself. In general, Forthright compensates participants somewhere between $3 and $4 for participation in a 10-15 minute survey. The rationale for recruiting participants via Forthright was simple, I could not obtain enough older adult participants through MTurk. Participants took about 20 minutes to complete the surveys. Upon completion, they were thanked for their participation and given compensation.

Table 6. Socio-demographic Characteristics of the Sample, Data Set 2

Demographic Variables	*n* (%)
Gender Identity	
Cisgender Man	173 (50.1%)
Cisgender Woman	169 (49%)
Intersex	1 (0.3%)
Genderqueer or nonbinary	2 (0.6)
Race/Ethnicity	
White/Caucasian	296 (85.8%)
Black/African American	34 (9.9%)
Asian/Asian American	2 (0.6%)
Mexican American/Latino/a	7 (2%)
American Indian/Native American	4 (1.2%)
Multiracial	1 (0.3%)
Other	1 (0.3%)
Education	
Less than high school	2 (0.6%)
Some high school	3 (0.9%)
High school diploma or GED	36 (10.4%)
Some college or vocational school	91 (26.4%)
Vocational degree or certificate	13 (3.8%)
College degree	123 (35.7%)
Master's degree	67 (19.4%)
Doctoral degree	10 (2.9%)
Employment Status	
Employed for wages	86 (24.9%)
Self-employed	49 (14.2%)
Out of work & looking for work	4 (1.2%)
Out of work & not looking for work	0 (0%)
Homemaker	1 (0.3%)
Student	0 (0%)
Military	0 (0%)
Retired	196 (56.8%)
Unable to work	9 (2.6%)
Financial Resources	
Poor/Impoverished	31 (9%)
Some financial resources	226 (65.5%)
Substantial financial resources	84 (24.3%)
Affluent/Rich	4 (1.2%)
Rural Status	
Rural	135 (39.1%)
Urban	210 (60.9%)
Marital Status	
Single	29 (8.4%)
Married/Partnered/Common Law	222 (64.3%)
Separated	5 (1.4%)

	Divorced	52 (15.1%)
	Widowed	37 (10.7%)
Access to Health Services		
	Very poor	4 (1.2%)
	Poor	11 (3.2%)
	Acceptable	79 (22.9%)
	Good	126 (36.5%)
	Very good	125 (36.2%)
Past Mental Health Services		
	Yes	122 (35.4%)
	No	223 (64.6%)
Past Subs. Use Treatment		
	Yes	81 (23.5%)
	No	264 (76.5%)

Analytic Plan

The primary analysis was a confirmatory factor analysis (CFA) to verify the factor structure identified in Chapter 3. Researchers have illustrated various adequate sample sizes when conducting an EFA. Researchers suggest a range of sample sizes to appropriately power a CFA. Some suggest that at least 200 participants (Hoe, 2008; Singh et al., 2016), whereas others indicate at least 300 participants represents an adequate or "good" sample size (Comrey, 1988; Comrey and Lee, 1992; Tabachnick & Fidell, 2013). However, all researchers suggest maximizing the number of participants because CFA procedures employ a highly complex series of analyses that can be bolster by high levels of power. Given these recommendations, I sought to recruit 300+ participants. To conduct this analysis, I used a structural equation modeling software (i.e., Mplus 8). In addition to confirming the model established in chapter 3, I was able to determine if the data fit other models (e.g., unidimensional; Hooper, Coughlan, & Mullen, 2008).

I evaluated model fit by using various absolute and relative indices. Specifically, I evaluated absolute fit by examining factor structures using Chi-squared ($\chi2$), root mean square error of approximation (RMSEA), and standardized root mean square residual (SRMR). Additionally, I evaluated relative fit by examining the comparative fit index (CFI). The following thresholds was deemed as fit by indices: $\chi2$ with a non-significant *p*-value (p > .05), RMSEA with a value less than .08, SRMR with a value less than 1, and CFI with a value greater than .90 (Hooper, Coughlan, & Mullen, 2008).

Additionally, I investigated violations of normalcy by examining metrics associated with skewness and kurtosis. This was completed by examining the KMO test of normality which detects violations of the normal distribution. Histograms were constructed to depict what the distribution of scores look like for each identified factor. In addition, internal consistency for each identified factor was evaluated by examining coefficient alpha. Alpha coefficients of .70 and above were deemed as acceptable while coefficients of 0.90 and above were deemed as exceptional. Finally, I evaluated rural and gender differences on participant's reports of alcohol misuse factors, as identified by the EFA. To determine if gender and rural differences occur, a MANOVA was conducted.

CHAPTER 5: RESULTS STUDY 2

Confirmatory Factor Analysis

A CFA was conducted to examine the fit between the data and the alcohol misuse 2-factor structure identified in Chapter 4. Mplus 8.0 was used to complete this analysis. The CFA was analyzed across numerous descriptive and model fit statistics. The results of this analysis are displayed in Figure 4. The composite goodness-of-fit statistical decision demonstrates a solid fit for the 2-factor model, χ^2(526, N = 402) = 1798.18, $p < .01$; RMSEA .08; CFI = .92; SRMR = .03. In comparison to general statistical standards, the χ^2 effect was significant which can suggest poor fit. However, it is important to acknowledge that χ^2 fails to adequately consider assumptions of multivariate normality and sensitivity to sample size, which can impact its capacity to sufficiently differentiate between levels of fit. Therefore, other indices of fit should be given greater consideration to account for these limitations.

A RMSEA value falling between the range of 0.05 and 0.08 indicates a good fit (Cangur & Ercan, 2015). Results reveal that the RMSEA fit index (.08) for the 2-factor structure falls in the top end of this range, which suggests the fit was solid. Regardless of sample size, the CFI capably analyzes model fit. Consistent with literature, a CFI value between .90 and .95 represents good fit (Hu & Bentler, 1999). Results demonstrated a CFI index fit of .92, which suggests good fit. The last fit index that was utilized was the SRMR. Professional standards characterize that effects below .05 represent models with good fit and effects between .05 and .08 represent models with good fit (Hu & Bentler, 1999). The SRMR index produced a score of .03, further suggesting the 2-factor structure demonstrates good fit. Overall, a collective interpretation of the fit indices demonstrate that the 2-factor structure generates solid to good fit.

Figure 4. Confirmatory Factor Analytic Model
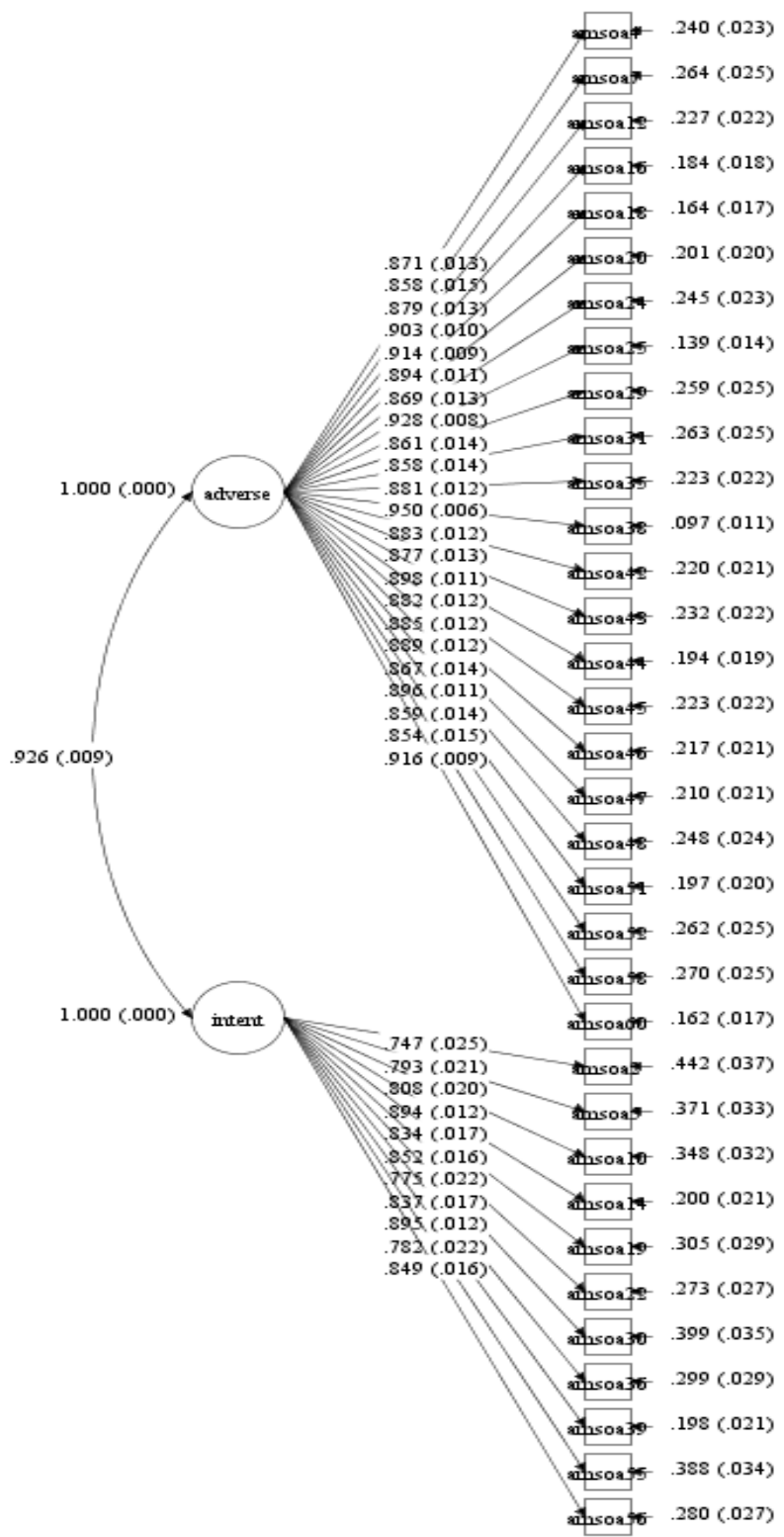
Internal Consistency Scores of Factors

Internal consistency was also assessed. The internal consistency was strong for Adverse Outcomes (α = .99) and Drinking Intention (α = .96). Overall, the scores demonstrate that the items effectively hold together for both identified factors.

Normalcy of Factors

The data were examined to evaluate the distribution of scores for the Adverse Outcomes factor (M = 50.51, SE = 2.10). The skewness of the data was .97 with a standard error of .13, and the kurtosis was -.87 with a standard error of .26. The Kolmogorov-Smirnov test was analyzed to evaluate if these effects violated the normal distribution. The results were significant, $D(345)$ = .31, $p < .01$, indicating the data are non-normally distributed. Specifically, the Adverse Outcomes scores display a positively skewed pattern as shown in the histogram (see Figure 5).

Figure 5. Normal Distribution for Factor 1 (Adverse Outcomes), Data Set 2
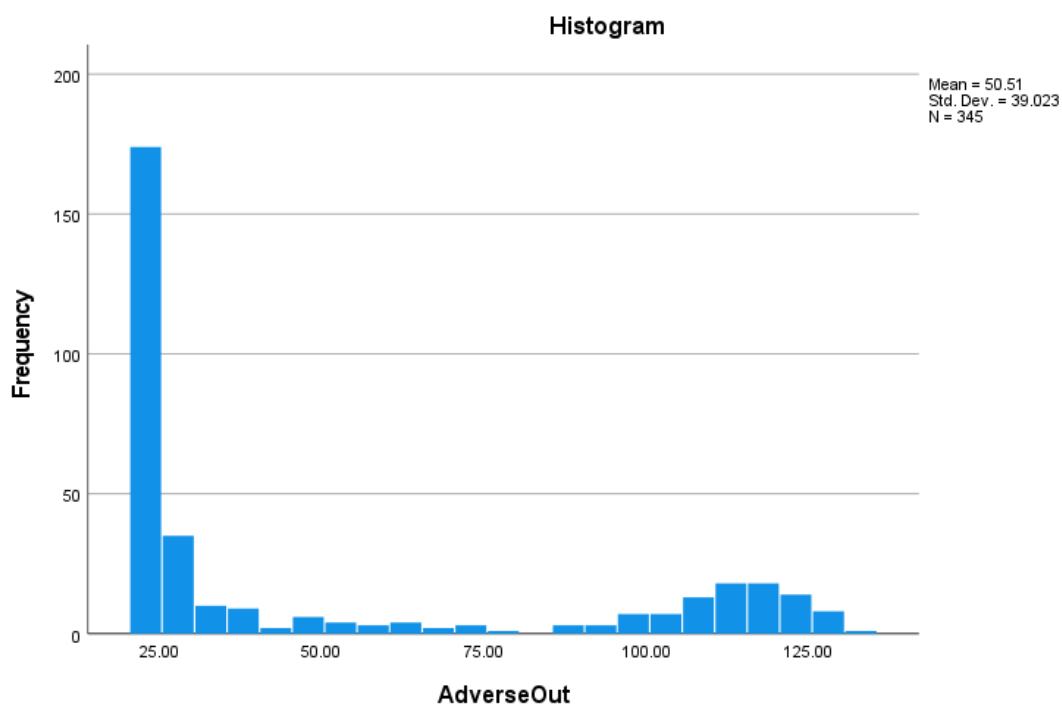
The same procedures were used to analyze the normal distribution for the Drinking Intention factor ($M = 28.25$, $SE = .99$). The skewness of the data was .54 with a standard error of .13, and the kurtosis was -1.37 with a standard error of .26. The Kolmogorov-Smirnov test was again analyzed to evaluate if these effects violated the normal distribution. These results were also significant, $D(345) = .21$, $p < .01$, indicating the data are non-normally distributed. Specifically, the Drinking Intention scores display a positively skewed pattern as shown in the histogram (see Figure 6).

Figure 6. Normal Distribution for Factor 2 (Drinking Intention), Data Set 2
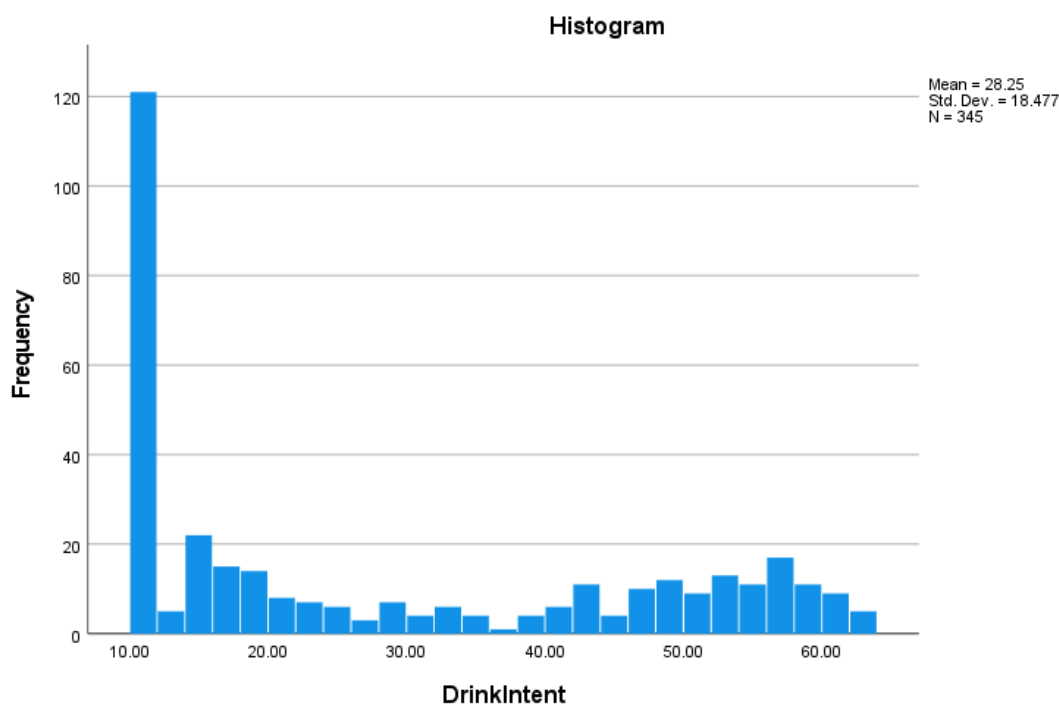
Mean Differences

A 2 (gender) x 2 (rurality) Factorial MANVOA was conducted to determine if gender and rural differences were reported on the identified alcohol misuse factor scores. Gender and rurality were both divided into two groups based on self-reported labels. For gender, there were 173 cisgender men and 169 cisgender women. No participants identified as gender non-binary or

genderqueer. For rurality, 133 participants identified living in a rural hometown and 209

participants identified living in a non-rural hometown.

The means and standard deviations for gender and rurality on the two alcohol misuse

factors are reported in Table 7. Results did not reveal a multivariate main effect for gender, $\lambda =$

.98, F(2, 337) = 2.68, *p* = .07, η_p^2 = .02, or for rurality, λ = *.99, F*(2, 337) = 1.74, *p* = .18, η_p^2 =

.01. Moreover, there was not a significant interaction effect, λ = *.99, F*(2, 337) = 1.90, *p* = .15,

η_p^2 = .01.

Although no significant multivariate differences were found between gender and rurality

on alcohol misuse factor scores, ANOVAs were still conducted to explore mean differences

between groups at a univariate level. Regarding Adverse Outcomes, results detected a non-

significant main effect for gender, $F(1,338)$ = .32, *p* > .05, η_p^2 < .01, a non-significant main

effect for rurality, $F(1,338)$ = 1.54, *p* > .05, η_p^2 < .01, and a non-significant interaction effect

between gender and rurality, $F(1,338)$ = 3.43, *p* > .05, η_p^2 = .01. Specifically, older adults

identifying as cisgender men (*M* = 50.45, *SD* = 37.58) reported comparable Adverse Outcome

scores compared to older adults identifying as cisgender women (*M* = 49.96, *SD* = 40.27).

Moreover, older adults residing in a rural area (*M* = 47.09, *SD* = 35.68) reported comparable

Adverse Outcome scores to older adults residing in non-rural areas (*M* = 52.20, *SD* = 40.74).

For Drinking Intention, results detected a non-significant main effect for gender, $F(1,338)$ =

2.16, *p* > .05, η_p^2 < .01, a non-significant main effect for rurality, $F(1,338)$ = .28, *p* > .05, η_p^2 <

.01, and a non-significant interaction effect between gender and rurality, $F(1,338)$ = 2.00, *p* >

.05, η_p^2 < .01. Specifically, older adults identifying as cisgender men (*M* = 29.31, *SD* = 18.00)

reported comparable Drinking Intention scores compared to older adults identifying as cisgender

women (*M* = 26.98, *SD* = 18.95). Moreover, older adults residing in a rural area (*M* = 27.59, *SD*

= 17.35) reported comparable Drinking Intention scores to older adults residing in non-rural

areas (*M* = 28.52, *SD* = 19.21).

Table 7. Means and Standard Deviations by Gender Identity and Rurality, Data Set 2

		Gender Identity	
		Women (n = 169)	Men (n = 173)
Adverse Outcomes Rural (*n* = 133)			
	Mean	41.62	52.01
	SD	32.66	37.75
	n	63	70
Non-Rural (*n* = 209)			
	Mean	54.92	49.39
	SD	43.57	37.61
	n	106	103
Drinking Intention Rural (*n* = 133)			
	Mean	24.48	30.39
	SD	16.71	17.55
	n	63	70
Non-Rural (*n* = 209)			
	Mean	28.46	28.57
	SD	20.10	18.35
	n	106	103

CHAPTER 6: METHODOLOGY STUDY 3

Participants

Participants in the current study included adults 55 years of age or older. I aimed to recruit 400+ older adults were recruited through Amazon's Mechanical Turk (MTurk) to ensure sufficient statistical power. Regarding regression equations, I used Green's formula, $104 + k$, where k equates to the number of predictors in a model (Green, 1991), to determine sample size. Using this formula, I needed 109 participants at minimum (5 predictor variables) to run the necessary analyses. However, I wanted to provide enough space to evaluate the model by different sociocultural groups, so I decided to double the minimum sample size requirement. Moreover, I needed more space to remove low quality data responses. As such, I doubled the minimum sample requirement again, leading to an optimal sample size of 436 participants. The recruitment process of MTurk was expected to gather representative data from individuals who identify with the following ethnic identities: White/European American, Black/African-American, Asian/Asian-American, Mexican American/Latino/a, American Indian/Native American, and multi-ethnic. Upon completion of the current study, participants received monetary compensation of $1.50.

Although 408 participants initially responded, 65 participants were excluded for not meeting basic and validity criteria. Specifically, participants were expected to meet the minimum age criteria of 55 years of age, provide give direct consent, give themselves adequate time to answer questions (non-speeding), answer the check question correctly, and complete at least 70% of survey items. Of the 65 excluded participants, 24 (36.9%) did not meet the age requirement, 13 (20%) answered the check question incorrectly, and 32 (49.2%) did not complete 70% of the survey items. Some participants were excluded for multiple violations. Therefore, the new total

sample for this study was 343 participants with an average age of 63.29 years ($SD = 5.60$). The

age range of the sample was between 55 and 80 years. See Table 8 for demographic information.

Table 8. Socio-demographic Characteristics of the Sample, Data Set 3

Demographic Variables	*n* (%)
Gender Identity	
Cisgender Man	152 (44.3%)
Cisgender Woman	191 (55.7%)
Intersex	0 (0%)
Genderqueer or nonbinary	0 (0%)
Race/Ethnicity	
White/Caucasian	327 (95.3%)
Black/African American	10 (2.9%)
Asian/Asian American	2 (0.6%)
Mexican American/Latino/a	2 (0.6%)
American Indian/Native American	1 (0.3%)
Multiracial	0 (0%)
Other	1 (0.3%)
Education	
Less than high school	0 (0%)
Some high school	2 (0.6%)
High school diploma or GED	18 (5.2%)
Some college or vocational school	31 (9%)
Vocational degree or certificate	14 (4.1%)
College degree	170 (49.6%)
Master's degree	101 (29.4%)
Doctoral degree	7 (2%)
Employment Status	
Employed for wages	175 (51%)
Self-employed	73 (21.3%)
Out of work & looking for work	4 (1.2%)
Out of work & not looking for work	1 (0.3%)
Homemaker	5 (1.5%)
Student	0 (0%)
Military	0 (0%)
Retired	78 (22.7%)
Unable to work	7 (2%)
Financial Resources	
Poor/Impoverished	18 (5.2%)
Some financial resources	216 (63%)
Substantial financial resources	96 (28%)
Affluent/Rich	13 (3.8%)
Rural Status	
Rural	115 (33.5%)
Urban	228 (66.5%)
Marital Status	
Single	22 (6.4%)
Married/Partnered/Common Law	267 (77.8%)
Separated	1 (0.3%)

	Divorced	38 (11.1%)
	Widowed	15 (4.4%)
Access to Health Services		
	Very poor	1 (0.3%)
	Poor	16 (4.7%)
	Acceptable	93 (27.1%)
	Good	150 (43.7%)
	Very good	83 (24.2%)
Past Mental Health Services		
	Yes	132 (38.5%)
	No	211 (61.5%)
Past Subs. Use Treatment		
	Yes	92 (26.8%)
	No	251 (73.2%)

Measures

The same demographic questions and developed alcohol misuse items administered in the first two studies (see Chapters 2 and 4) were administered in this study. In addition, several other measures were given to examine convergent and concurrent validity with constructs that are consistently recognized as relatedly important to alcohol misuse within literature. The following measures are validated and consistently valued in the older adult literature, allowed me to evaluate unique correlates to alcohol misuse (Andresen et al., 1994b; Federici et al., 2016; Stanley, Beck, & Zebb, 1998).

Centre for Epidemiological Studies Short Depression Scale (CESD-10). Depression was measured using the CESD-10 (Andresen et al., 1994a). This 10-item measure requests individuals to respond to statements of depressed mood in the past week using a scale ranging from 0 (*none of the time*) to 3 (*most of the time*). Higher scores suggest greater elevations in depressed mood. The CESD-10 demonstrates good predictive validity when compared to the full version of the CES-D (Andresen et al., 1994a) and high internal consistency ($\alpha = .86$; Andresen

et al., 2013). Likewise, the CESD-10 correlates with poor health status and positive affect, suggesting high convergent validity (Andresen et al., 1994a). Finally, the CESD-10 demonstrates strong test-retest reliability after a 12-month interval (Andresen et al., 1994a). In the current study, the CESD-10 scale reported good internal consistency (α = .81).

Multidimensional Scale of Perceived Social Support (MSPSS). Social support was measured using the MSPSS (Zimet et al., 1988). The measure specifically assesses perceived adequacy of social support from family, friends, and significant others. This measure requests individuals to rate their degree of agreement ranging from 1 (*very strongly disagree*) to 7 (*very strongly agree*) on 12 items. The measure possesses strong internal consistency (α = .81–.94; Zimet et al., 1988; Zimet et al., 2011) and good test-retest reliability (α = .85; Zimet et al., 1988). Additionally, the MSPSS exhibits good construct validity with measures of anxiety and depression (Zimet et al., 1988). In the current study, the MSPSS total score reported good internal consistency (α = .95).

World Health Organization Disability Assessment Schedule 2.0-12 (WHODAS-12). General health was measured using the WHODAS-12 (Üstün & WHO, 2004), which assesses variation in respondent general health and disability symptoms. The WHODAS-12 asks respondents to rate their general health difficulties in the past 30 days. Specifically, respondents are asked to rate how much difficulty they experience on each item on a scale of 1 (*none*) to 5 (*extreme or cannot do*). The 12-item version explains 81% of the variance of the full 36-item version (Üstün & WHO, 2004). The WHODAS-12 demonstrates high internal consistency (α = .86 - .89; Federici et al., 2016) and high test-retest reliability (α = .98, Üstün & WHO, 2004). Additionally, WHODAS-12 demonstrates excellent concurrent validity with other health-related

instruments (Üstün & WHO, 2004). In the current study, the WHODAS-12 total score reported good internal consistency (α = .96).

Alcohol Use Disorders Identification Test (AUDIT). The AUDIT was also administered in order to compare Alcohol Misuse Scale for Older Adults scores to those of an already psychometrically established alcohol use measure. The AUDIT was designed to quickly identify hazardous or harmful use among adult populations (NIAAA, 2000; WHO, 2001). It includes ten items that assess the degree and frequency of alcohol use, symptoms associated with alcohol dependence, and problematic concerns caused by use within the past year (NIAAA, 2000). The AUDIT demonstrates good test-retest reliability (r = .86) and internal consistency (NIAAA, 2000; WHO, 2001). In addition, it demonstrates sufficient content, criterion, and construct validity (NIAAA, 2000; WHO, 2001). In the current study, the AUDIT total score reported good internal consistency (α = .92).

Procedure

Participants in the current study were recruited through the MTurk system, similar to the first two studies in this project. Interested participants were directed to a Qualtrics survey. The initial page on the Qualtrics survey was an informed consent sheet that thoroughly explains the nature of the study. To participate in this study, individuals were required to provide passive informed consent by checking a box noting their willingness to participate. After completing the passive informed consent procedures, participants were directed to the administration of the survey, where they responded to demographic questions, the developed alcohol misuse questionnaire, and other psychological measures. Participants took about 15 minutes to complete the surveys. Upon completion, they were thanked for their participation and given compensation.

Analytic Plan

I investigated violations of normalcy by examining metrics associated with skewness and kurtosis. This was completed by examining the KMO test of normality which detects violations of the normal distribution. Histograms were constructed to depict what the distribution of scores looked like for each identified factor. In addition, internal consistency for each identified factor was evaluated by examining coefficient alpha. Alpha coefficients of .70 and above were deemed as acceptable while coefficients of 0.90 and above were deemed as exceptional. Finally, I evaluated rural and gender differences on participant's reports of alcohol misuse factors, as identified by the EFA. To determine if gender and rural differences occur, a series of ANOVAs were conducted.

To evaluate convergent validity, I investigated the relationships between identified factors and theoretically relevant constructs (i.e., depression, social support, general health). To evaluate these relationships, I conducted a bivariate correlation matrix. In addition, to further evaluate construct validity, I evaluated how identified factors are associated with theoretically relevant outcomes through a series of regression models. Specifically, I evaluated if identified alcohol misuse factors accounted for variation in estimates of depression, social support, alcohol use, and general health. Based on research (Brennan & Soohoo, 2013; Brooks et al., 2017; Edwards et al., 2014; Kelly et al., 2018; Kuerbis et al., 2014; SAMHSA, 2020b; Steinhagen & Friedman, 2008; Stone et al., 2012; Thomas & Rockwood, 2001), it is expected that alcohol misuse factors will be positively associated with depression and general health concerns, and inversely associated with social support.

CHAPTER 7: RESULTS STUDY 3

Internal Consistency Scores of Factors

Internal consistency was assessed after analyzing the items in both factors. The internal consistency score was strong for Adverse Outcomes ($\alpha = .99$) and Drinking Intention ($\alpha = .95$). Overall, the scores demonstrate that the items effectively hold together for both identified factors.

Normalcy of Factors

The data were examined to evaluate the distribution of scores for the Adverse Outcomes factor ($M = 66.31$, $SE = 2.20$). The skewness of the data was .12 with a standard error of .13, and the kurtosis was -1.72 with a standard error of .26. The Kolmogorov-Smirnov test was analyzed to evaluate if these effects violated the normal distribution. The results were significant, $D(343) = .22$, $p < .01$, indicating the data are non-normally distributed. Specifically, the Adverse Outcomes scores display a positively skewed pattern as shown in the histogram (see Figure 7).

Figure 7. Normal Distribution for Factor 1 (Adverse Outcomes), Data Set 3
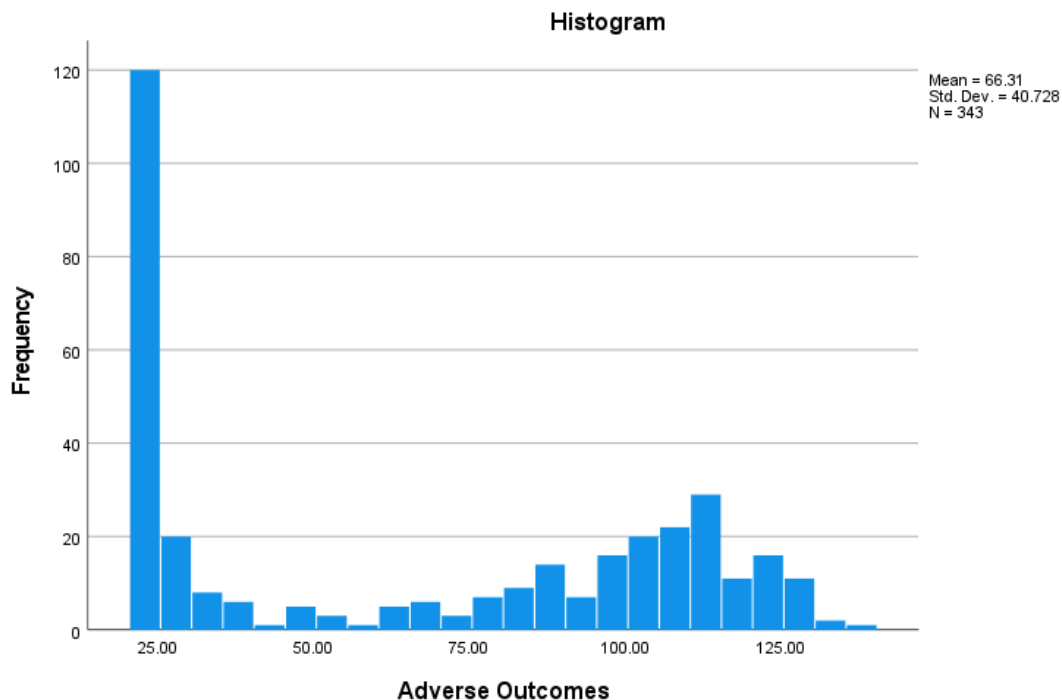
The same procedures were used to analyze the normal distribution for the Drinking Intention factor ($M = 34.52$, $SE = .99$). The skewness of the data was -.03 with a standard error of .13, and the kurtosis was -1.55 with a standard error of .26. The Kolmogorov-Smirnov test was again analyzed to evaluate if these effects violated the normal distribution. These results were also significant, $D(343) = .14$, $p < .01$, indicating the data are non-normally distributed. Specifically, the Drinking Intention scores display a positively skewed pattern as shown in the histogram (see Figure 8).

Figure 8. Normal Distribution for Factor 2 (Drinking Intention), Data Set 3
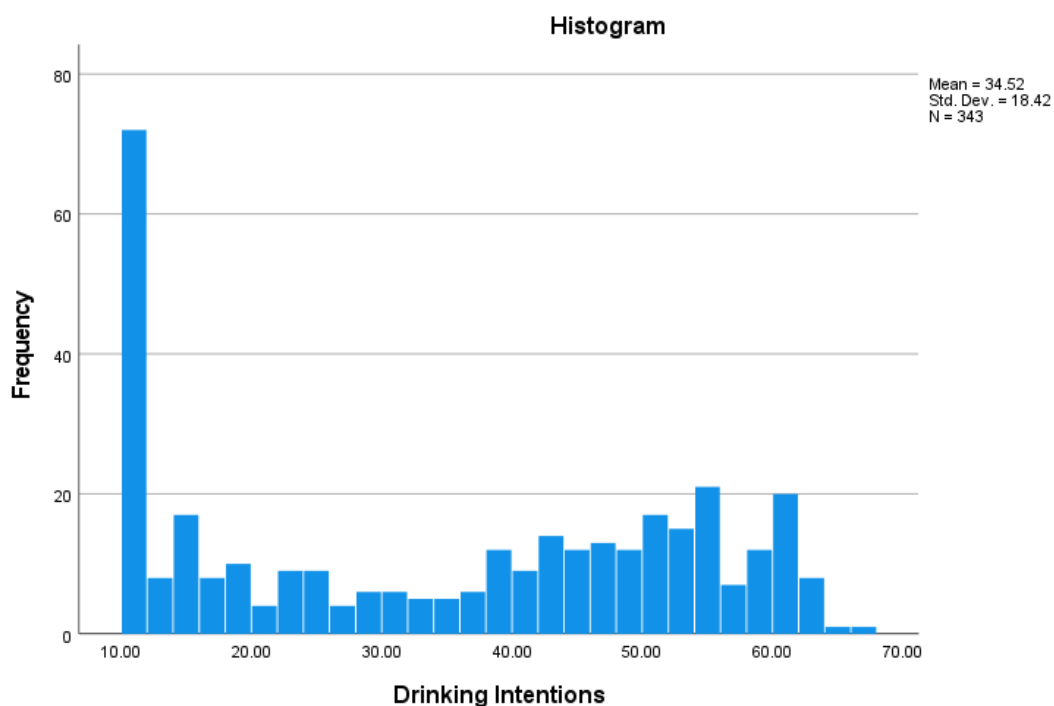
Histogram

Mean = 34.52
Std. Dev. = 18.42
N = 343

Mean Differences

       A 2 (gender) x 2 (rurality) Factorial MANVOA was conducted to determine if gender and rurality differences were reported on the identified alcohol misuse factor scores. Gender and rurality were both divided into two groups based on self-reported labels. For gender, there were 152 men and 191 women listed in the sample. No participants identified as gender non-binary or genderqueer. For rurality, 115 participants identified living in a rural hometown and 228 participants identified living in a non-rural hometown.

       The means and standard deviations for gender and rurality on the two alcohol misuse factors are reported in Table 9. Results did not reveal a multivariate main effect for gender, $\lambda = .99$, $F(2, 338) = 2.07$, $p = .13$, $\eta_p^2 = .01$, or for rurality, $\lambda = .99$, $F(2, 338) = 1.01$, $p = .36$, $\eta_p^2 < .01$. While there were no significant main effects, there was a significant interaction effect, $\lambda = .98$, $F(2, 338) = 3.09$, $p < .05$, $\eta_p^2 = .02$.

Follow-up ANOVAs were conducted to explore mean differences between groups at a univariate level. Regarding Adverse Outcomes, results detected a significant main effect for gender, $F(1,339) = 3.89$, $p < .05$, $\eta_p^2 = .01$, a non-significant main effect for rurality, $F(1,339) = 1.03$, $p > .05$, $\eta_p^2 < .01$, and a significant interaction effect between gender and rurality, $F(1,339) = 4.81$, $p < .05$, $\eta_p^2 = .01$. Specifically, older adults identifying as cisgender men ($M = 69.53$, $SD = 40.25$) reported higher Adverse Outcome scores compared to older adults identifying as cisgender women ($M = 63.76$, $SD = 41.03$). However, older adults residing in a rural area ($M = 62.52$, $SD = 41.91$) reported comparable Adverse Outcome scores to older adults residing in non-rural areas ($M = 68.23$, $SD = 40.08$). Regarding the interaction effect, it appears gender differences vary based on geographic location. Notably, older adult men residing in rural areas ($M = 73.13$, $SD = 42.37$) reported higher levels of Adverse Outcomes compared to older adult men residing in non-rural areas ($M = 67.65$, $SD = 39.19$). Interestingly, the opposite pattern was revealed for women. Specifically, older adult women residing in rural areas ($M = 53.76$, $SD = 39.75$) reported lower levels of Adverse Outcomes compared to older adult women residing in non-rural areas ($M = 68.68$, $SD = 40.90$).

For Drinking Intention, results detected a significant main effect for gender, $F(1,339) = 4.03$, $p < .05$, $\eta_p^2 = .01$, a non-significant main effect for rurality, $F(1,339) = .28$, $p > .05$, $\eta_p^2 < .01$, and a significant interaction effect between gender and rurality, $F(1,339) = 6.17$, $p < .05$, $\eta_p^2 = .02$. Specifically, older adults identifying as cisgender men ($M = 35.91$, $SD = 18.19$) reported higher Drinking Intention scores compared to older adults identifying as cisgender women ($M = 33.41$, $SD = 18.57$). However, older adults residing in a rural area ($M = 33.44$, $SD = 19.62$) reported comparable Drinking Intention scores to older adults residing in non-rural areas ($M = 35.06$, $SD = 17.80$). Regarding the interaction effect, it appears gender differences vary based on

geographic location. Notably, older adult men residing in rural areas ($M = 38.62$, $SD = 18.94$) reported higher levels of Adverse Outcomes compared to older adult men residing in non-rural areas ($M = 34.50$, $SD = 17.72$). Interestingly, the opposite pattern was revealed for women. Specifically, older adult women residing in rural areas ($M = 29.17$, $SD = 19.29$) reported lower levels of Adverse Outcomes compared to older adult women residing in non-rural areas ($M = 35.50$, $SD = 17.92$).

Table 9. Means and Standard Deviations by Gender Identity and Rurality, Data Set 3

| | | Gender Identity | |
		Women (*n* = 191)	Men (*n* = 152)
Adverse Outcomes			
Rural (*n* = 115)			
	Mean	53.76	73.13
	SD	39.75	42.37
	n	63	52
Non-Rural (*n* = 228)			
	Mean	68.68	67.65
	SD	40.90	39.19
	n	128	100
Drinking Intention			
Rural (*n* = 115)			
	Mean	29.17	38.62
	SD	19.29	18.94
	n	63	52
Non-Rural (*n* = 128)			
	Mean	35.50	34.50
	SD	17.92	17.72
	n	128	100

Convergent Validity

Bivariate Correlations. To evaluate convergent validity, cross-sectional and bivariate correlations were analyzed. Specifically, I analyzed the relationships between the two identified alcohol misuse factors (Averse Outcomes and Drinking Intention) and theoretically relevant constructs (depression, social support, general health, general alcohol misuse). A correlation matrix of the bivariate correlations is shown in Table 10.

As expected, both alcohol misuse factors were positively associated with depression, general health concerns, and alcohol use. This indicates that individuals who report higher levels of Adverse Outcomes and Drinking Intention also report higher levels of depression, general

health concerns, and alcohol use. On the other hand, both alcohol misuse factors were not

significantly associated with social support, which was inconsistent with the hypotheses.

Table 10. Cross-Sectional Relationships between the Factor Scores and Theoretically Related Constructs

Variables	1	2	3	4	5	6
1. Adverse Outcomes	--	.917**	.661**	-.040	.839**	.847**
2. Drinking Intention		--	.684**	-.009	.799**	.824**
3. Depression			--	.159**	.742**	.692**
4. Social Support				--	.069	.014
5. General health Concerns					--	.791**
6. Alcohol Use						--

Note: $* = p < .05$, $** = p < .01$.

Multiple Regressions. It is important to analyze the association between alcohol misuse

factors and related clinical psychological constructs. Therefore, I conducted multiple regression

models to determine whether alcohol misuse factors could account for variation in three different

outcomes: depression, social support, and general health. I also examined if alcohol misuse

factors could account for variation in an already established alcohol misuse measure (AUDIT).

Depression. Alcohol misuse factors were inserted as predictors to account for variation

in depression scores. Results revealed that the combined alcohol misuse factors accounted for

47.5% of the variance in depression scores, $F(2,340) = 153.82$, $p < .01$. When analyzing each

predictor individually, the Adverse Outcomes ($b = .21$, $p < .05$) and Drinking Intention ($b = .49$,

$p < .01$) factors uniquely accounted for variance in depression (see Table 11). Consistent with

current literature, alcohol misuse related to Adverse Outcomes and Drinking Intention seem to

meet basic criteria for risk factors to depression.

Social Support. Alcohol misuse factors were inserted as predictors to account for

variation in social support scores. Results revealed that the combined alcohol misuse factors only

accounted for 0.7% of the variance in social support scores, $F(2,340) = 1.12$, $p > .05$. When

analyzing each predictor individually, neither the Adverse Outcomes ($b = -.20$, $p > .05$) nor Drinking Intention ($b = .49$, $p > .05$) factors accounted for unique variance in social support (see Table 11). Inconsistent with current literature, alcohol misuse related to Adverse Outcomes and Drinking Intention was not associated with social support at a multivariate level.

General Health. Alcohol misuse factors were inserted as predictors to account for variation in general health scores. Results revealed that the combined alcohol misuse factors accounted for 71% of the variance in general health scores, $F(2,340) = 415.66$, $p < .01$. When analyzing each predictor individually, the Adverse Outcomes ($b = .67$, $p < .05$) and Drinking Intention ($b = .18$, $p < .05$) factors uniquely accounted for variance in general health concerns (see Table 11). Consistent with current literature, alcohol misuse related to Adverse Outcomes and Drinking Intention seem to meet basic criteria for risk factors of general health concerns.

Alcohol Use. Alcohol misuse factors were also inserted as predictors to account for variation in total alcohol use from an established alcohol use measure (AUDIT). Results revealed that the combined alcohol misuse factors accounted for 73.3% of the variance in alcohol use scores, $F(2,340) = 448.49$, $p < .01$. When analyzing each predictor individually, the Adverse Outcomes ($b = .57$, $p < .01$) and Drinking Intention ($b = .31$, $p < .01$) factors uniquely accounted for variance in alcohol use (see Table 11). These findings suggest high levels of concurrent validity.

Table 11. Alcohol Misuse Factors as Predictors of Related Constructs

Outcome	Predictors	Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	*b*	*t*	*p*
Depression						
	Adverse Outcomes	.030	.014	.212	2.153	.032
	Drinking Intention	.153	.031	.489	4.966	<.001
Social Support						
	Adverse Outcomes	-.175	.051	-.202	-1.489	.137
	Drinking Intention	.146	.112	.177	1.302	.194
General Health						
	Adverse Outcomes	.209	.023	.673	9.181	<.001
	Drinking Intention	.124	.050	.182	2.477	.014
Alcohol Use						
	Adverse Outcomes	.134	.017	.565	8.058	<.001
	Drinking Intention	.163	.037	.308	4.391	<.001

CHAPTER 8: DISCUSSION

Review of Purpose

The ultimate goal of the current study was to improve identification and assessment methods for alcohol misuse behaviors in older adults. By developing a more developmentally relevant measure, researchers can better evaluate important features regarding the onset and maintenance of alcohol misuse for older adults. Additionally, armed with a developmentally responsive measure for misuse, clinicians can more accurately identify, diagnose, and plan treatment for older adults with alcohol use concerns. Given the overall goal, several hypotheses and research questions were developed based on an extensive review of current literature. First, I expected items would hold together in an internally consistent manner ($\alpha > .70$). Next, I hypothesized that there would be a clear multidimensional factor structure associated with the evaluation of the items as alcohol use can have behavioral, psychosocial, and health-related effects. Moreover, based on current research, I hypothesized that these factors would be positively related to depression and health concerns and inversely related to social support. Lastly, I sought to determine if alcohol misuse factors in older adult populations vary as a function of gender and rural status.

Factor Structure

A series of EFAs were conducted to determine how the instrument's items dispersed into unique factors. After the removal of items with cross-loadings from the first and second EFA, a third and final EFA produced a two-factor structure. Of the initial 60 items that were included in the EFA, 26 items were removed due to cross-loadings and 34 items withheld in the final model. All remaining items produced adequate factor loading scores with no cross-loadings onto two unique factor themes. The content underlying these two themes was analyzed and appropriate

labels were given. After the two-factor structure was generated, an examination between withheld and removed items occurred. Items that loaded onto the first factor were related to negative consequences or outcomes that people experience due to drinking. Items that loaded onto the second factor were mostly related to reasons why people drink or continue to drink.

After developing a 2-factor structure from the EFA, a CFA was conducted to evaluate the goodness of fit. A cumulative interpretation of the goodness of fit indices for the 2-factor structure demonstrates solid to good fit. In total, these procedures were consistent with the prevailing best practices in test development and evaluation as highlighted by Clark and Watson (2019). Because I followed these recommendations, I believe my output is important and practically meaningful; the developed measure can meaningfully assess for alcohol misuse in older adult populations. The creation of this measure provides a tangible and unique contribution to the field. Currently, commonly used measures for misuse were originally developed for younger adult populations and inaptly applied to older adult populations, which is a significant pitfall outlined by multicultural theorists who investigate best cultural practices in administering and interpreting assessments (Laher & Cockcroft, 2017). As a result, my measure helps fill the need for a comprehensive assessment that is developmentally appropriate for older adults who express difficulties with alcohol misuse. Moving forward, it will be important to determine how this new tool will support conceptualization processes, so clinicians can further understand how alcohol use difficulties manifest in older adult communities.

The current measure could be strengthened by future studies by evaluating the utility of the measure to account for unique alcohol misuse behaviors in diverse samples of older adults. For example, it would be beneficial to gather samples that vary by ethnic identity status, geographic location, and clinical levels to test the stability of the factor structure and estimates of

reliability and validity. Additionally, it may be important to extend the original collection of items to capture more unique behaviors common in older adulthood and general use behaviors. For instance, more items of age-related identity perceptions and developmental changes could be further evaluated to increase the comprehensive and developmentally situated nature of the measure.

In addition, it was important to evaluate the content of items that did not effectively load onto one of these two dimensions for misuse. Through a content investigation, it appears that items related to tolerance, undesirable self-perceptions related to drinking behaviors, and attempts to decrease or quit drinking were left out of the two-factor structure. This was somewhat surprising, especially considering substance use difficulties in older adulthood are often framed from tolerance and withdrawal perspectives (Rehm & Manthey, 2017). Moreover, withdrawal and tolerance symptoms are key in making effective diagnostic decisions regarding alcohol use and withdrawal-based disorders (American Psychological Association, 2022).

In total, a review of the retained and dismissed items tells an interesting conceptual story about the nature of the developed measure. Specifically, retained items tap themes commonly associated with drinking triggers and drinking consequences. These items do not appear to contain a diverse array of tolerance and withdrawal type symptoms. Taking these patterns into consideration, it appears my measure of misuse may be more targeted to behaviors that bolster misuse rather than measuring for chronically concerning patterns of use and withdrawal. As such, this measure may be conceived as a good screening or determinant tool rather than instrument designed to capture severe and persistent use, tolerance, and withdrawal symptoms. In the future, it will be important to evaluate the predictive validity of the misuse factors with

severe, diagnosable alcohol use and alcohol withdrawal metrics to better classify the nature and function of the developed measure.

Internal Consistency

The reliability for both factor scores were evaluated at all three administrations of the survey to examine internal consistency. In all three administrations, the internal consistency factor scores were excellent for Adverse Outcomes (α = .95) and Drinking Intention (α = .95-.96). Given the significantly high and stable internal consistency scores, this suggests that the items cluster together well across different samples of older adults. However, it would be advantageous for future studies to analyze if the current measure can reliably assess for misuse for the same older adult sample across time. Evaluating test-retest reliability analyses will be important in advancing the psychometrics soundness of the measure. Because of the persistent nature of alcohol use in general, it would be interesting to evaluate test-retest estimates over the course of 3-, 6-, and 12-month intervals.

Validity

I evaluated the relationship between alcohol misuse dimensions and theoretically relevant constructs to demonstrate convergent validity. Specifically, I conducted a correlation matrix and a series of multiple regressions to analyze relationships between the identified misuse factors and depression, general health concerns, social support, and general alcohol use. Overall, data demonstrated good convergent validity. Both alcohol misuse factors (Adverse Outcomes and Drinking Intention) were positively related with depression, general health concerns, and general alcohol use. These findings are consistent with current literature (APA, 2013; Arndt & Schultz, 2015; Barry, Blow, & Oslin, 2002; Brennan & Soohoo, 2013; Dar, 2006; Kelly et al., 2018; Kuerbis et al., 2014; Ramsey, Engler, & Stein, 2005; SAMHSA, 2020b; Satre et al., 2012;

Steinhagen & Friedman, 2008; Üstün et al., 2010), which suggests that the measure validly assesses for alcohol misuse features in older adult populations.

It is important for researchers to continue evaluating the relationship between alcohol misuse factors and theoretically relevant constructs in the future. While a positive correlation is a foundational benchmark for determining risk factors, a notable next step is to determine if alcohol misuse dimensions have a causal relationship to the onset and maintenance of depression and general health concerns. Moreover, it would be important for future research to evaluate how alcohol misuse factors can predict these conditions across time by using longitudinal designs. Research evaluating how these factors contribute to higher levels of alcohol use disorders though experimental studies will also be important. These types of investigations will increase support indicating the alcohol misuse factors are stable risk factors for depression, general health concerns, and alcohol use problems.

A unique finding was revealed when examining the relationship between alcohol misuse and social support. I initially predicted there would be a moderate to high inverse relationship between these variables. However, neither dimension of the measure was found to have a significant relationship with social support. This finding is inconsistent with current literature as there is a consensus of strong links between alcohol misuse and social support (Brooks et al., 2017; Kelly et al., 2018; Kuerbis et al., 2014; Lee et al., 2020; Rodriguez & Cohen, 1998; Schwarzer, Knoll, & Rieckmann, 2003; Stahl & Schulz, 2014; Steinhagen & Friedman, 2008; Stone et al., 2012). However, it is important to mention that there appears to be a nuance within the literature that may explain why the current finding is not consistent with literature. While older adult populations generally value social support, there tends to be a developmental transition away from quantity and breadth of social support and more so toward quality of small

social support systems (Carstensen, 1991; Löckenhoff & Carstensen, 2004). Because my social

support measures, at some level, taps the frequency of strong social bonds rather than the depth

of available social bonds, my results may not be so surprising. Given this pattern, it would be

valuable to reevaluate the relationship between alcohol misuse and social support. For instance,

re-evaluating this relationship using more measures assessing for richness of social bonds rather

than the frequency of social bonds may yield more fruitful findings.

Dimensions of Older Adult Misuse

The current measure identifies multiple dimensions when assessing for alcohol misuse in

older adult populations, meaning there may be various components to evaluate when determining

the onset and maintenance of alcohol misuse. Current findings support more comprehensive

measures to be used in evaluating pertinent behavioral concerns in older adult populations (Arndt

& Schultz, 2015; Bartels et al., 2013; Kuerbis et al., 2014; Shutte et al., 2014). Whereas using

unidimensional measures may be somewhat reductive in understanding how bigger concerns of

alcohol misuse can be conceptualized and evaluated, multidimensional measures can be

important in revealing how dimensions of alcohol misuse differentially predict other outcomes.

For instance, it is possible that Adverse Outcomes may be a better predictor for legal troubles

compared to Drinking Intention. Knowing this might help clinicians devise more tailored

prevention and intervention approaches to best meet the needs of older adults with specific

behavioral health needs.

Demographic Differences

To evaluate if alcohol misuse patterns differ for individuals based on their gender identity

and rural status, mean scores on the two alcohol misuse dimensions were investigated. A

MANOVA was conducted to determine if there were any significant main effects and interaction

effects. No differences were revealed in Study 1 or Study 2, such that no significant differences between gender identities and rural statues were apparent. However, in Study 3, results detected gender and rural-based differences. Looking at follow-up univariate ANOVAs, results revealed a significant difference for gender identity. Specifically, cisgender men reported higher levels of both alcohol misuse dimensions than cisgender women. This finding is consistent with current literature as men generally consume more alcohol, while also experiencing more alcohol-related consequences as compared to women (White, 2020).

Moreover, in Study 3, there was a significant interaction effect, suggesting older adult men residing in rural areas reported higher levels of misuse compared to older adult men residing in non-rural areas. Paradoxically, older adult women residing in rural areas reported lower levels of misuse compared to older adult women residing in non-rural areas. This interaction appears to be a unique finding that is not entirely consistent with current literature. Specifically, research suggests older adults in general report higher levels of drinking and more concerns when residing in rural areas (Dixon & Chartier, 2016; Friesen et al., 2021). Higher levels of consumption and alcohol-related concerns for older adult women residing in non-rural as compared to rural areas do not appear to be captured well within literature. If this finding is replicated via future studies, it offers a unique platform by which theorists, researchers, and clinicians can mold effective prevention plans. For instance, it would provide professionals with the opportunity to consider how prevention strategies need to be tailored for older adult men and women residing in rural areas.

However, the discordant results across studies cast doubt on whether differences among misuse dimensions exist. A reasonable explanation for these mixed findings is differences in sample demographics. In Study 3, there was a less ethnically diverse sample compared to Studies

1 and 2, such that Study 3 included more representation from white identifying individuals. Moreover, more participants in Study 3 reported residing in non-rural areas as compared the previous studies. It is possible these differences in sample composition could account for variation in the findings. Additionally, it is possible participants in Study 3 had more difficulties determining the geographic location of their home, resulting in skewed group composition. For instance, some who live in small towns with moderate resources may perceive themselves living in a rural town when compared to others residing in a big city. Because of these issues, it will be important for future research to re-evaluate my findings. Specifically, it will be important to use better metrics in establishing rural and non-rural group membership.

Clinical Significance

The current measure appears to be a robust assessment for alcohol misuse in older adult populations. A variety of behavioral health settings can benefit from this novel measure since it can better capture developmentally relevant and appropriate features of alcohol misuse behaviors with older adults. Researchers will be able to evaluate key processes in how older adults first engage in, maintain consistent use of, and exacerbate problematic alcohol-related difficulties. In addition, researchers can identify important risk and protective factors playing a role in the exacerbation or minimization of alcohol misuse specifically for older adult populations. For clinicians, they will be able to use the measure to identify and diagnose older adults who present with alcohol use concerns more accurately. In turn, clinicians will be better equipped for conceptualizing the impact of alcohol misuse on older adult health and develop more appropriate and beneficial methods of treating these difficulties.

Limitations

There are several limitations that are worth mentioning despite the measure demonstrating to be a valid and reliable assessment for alcohol misuse with older adult populations. Across Studies 1-3, the participants' demographics did not provide a proportionally representative sample of the overall population. Specifically, the samples were predominately white, mostly women, generally educated, and mostly urban residents. This may be due to using MTurk as the initial method for recruiting participants. It may have been more advantageous to solely use Forthright in gathering participant data since that platform generated a more generalizable sample. It is also notable to mention that the primary reason for using Forthright to gather data is because MTurk was unable to recruit enough participants to meet inclusionary requirements for participation. It is important to reevaluate current studies with more proportionally diverse samples to strengthen the generalizability of current findings. Similarly, it would be promising to gather samples from more diverse clinical settings. Current samples were heavily skewed toward no to minimal alcohol use which could influence how items held together in the factor analysis models. Including clinical samples within these analyses could better capture more severe alcohol misuse patterns.

In addition, there was a wide age range for participants. While most participants fell within 55-70 years of age, there were many that were still above 70 years of age and several who were 85+ years. Although it is important to capture a range of older adults within analyses, having up to a 30+ year gap in age can cause conflict between different age groups. Specifically, alcohol misuse for individuals at age 55 may look different from those who are 85 years of age. For example, one item that was removed from the factor analysis process was about loss of loved ones. This item may not be as relevant for a 55-year-old individual, while it may be very relevant

for an 85-year-old. Future research would benefit from examining different age groups (e.g., 65-74, 75-84, 85+) within older adult populations to determine how items vary in magnitude.

Another limitation of the current studies was the restriction of a cross-sectional design. Incorporating a longitudinal design instead could have revealed meaningful clinical implications that may have been missed with a cross-sectional design. For instance, having only one point in time to assess for alcohol misuse rather than two or more could overly minimize accounted variance in clinical outcomes by the alcohol misuse factors. Future research could benefit from reproducing current studies with survey administrations across various longitudinal intervals (e.g., 3, 6, and 12 months) to capture a better understanding of convergent and predictive validity. Moreover, a longitudinal design could improve the measure's overall reliability by establishing test-retest reliability.

General Conclusion

The overall goal of the current studies was to improve identification and assessment methods for alcohol misuse behaviors in older adults by developing a more developmentally relevant measure. This measure attempts to fill a gap in the literature as many commonly used measures for older adults do not capture unique developmental and behavioral features for older adult populations. Reviewing the steps for the development of this measure, multiple internally consistent factors of alcohol misuse (i.e., Adverse Outcomes, Drinking Intention) were initially identified and confirmed. In addition, alcohol misuse factors were validated in relation to theoretically relevant constructs (e.g., depression, general health concerns, social support, general alcohol use), suggesting high levels of convergent validity. Across studies, internal consistency metrics suggest the items underlying each dimension of alcohol misuse hold together well. Moreover, results generated some mixed findings regarding gender identity and rural

differences in reports of alcohol misuse. Interestingly, results detected a significant interaction effect where older adult men residing in rural areas reported higher levels of alcohol misuse compared to older adult men residing in non-rural areas. Conversely, older adult women residing in rural areas reported lower levels of alcohol misuse compared to older adult women residing in non-rural areas. Overall, through these procedures and data, the current measure appears to be a robust and psychometrically sound instrument to assess for alcohol misuse in older adult populations.

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APPENDIX 1

Instructions: Reflect on your experience with alcohol use in the past year. Using your perceptions, rate how frequent the following items occurred. Please place a mark in the box that best corresponds with your experience.

Items	0 (Never or Not Related)	1 (Rarely)	2 (Sometimes)	3 (Often)	4 (Always)
1. It was harder for me to get drunk when drinking.					
2. I intended to get drunk when drinking.					
3. I found it easier to fall asleep after drinking.					
4. I have required extra healthcare services (e.g., doctor appointments, hospitalization) because of my drinking.					
5. I drank excessively (3 or more alcoholic beverages per sitting).					
6. I drank to enhance my sexual behavior.					
7. I felt disappointed that it took so much alcohol for me to det drunk.					
8. I spent less time involved in enjoyable hobbies or activities because I felt the need to drink.					
9. I spent less time with friends in order to drink.					
10. I continued to drink even though I had other health issues (e.g., diabetes, high blood pressure, congestive heart failure, liver problems, osteoporosis).					
11. I drank because I have lots of regrets.					
12. I had difficulties attending work on time.					
13. I experienced problems with family because of my drinking.					
14. I drank to decrease sadness.					
15. I engaged in reckless behaviors (e.g., driving, gambling, unsafe sex) while under the influence of alcohol.					

16. I spent a great deal of time trying to get sober from drinking.					
17. I thought to myself that alcohol is not strong enough.					
18. I had trouble developing new relationships because of my drinking.					
19. My physical pain was easier to manage after drinking.					
20. I experienced problems with friends because of my drinking.					
21. I drank while under the influence of a prescribed medication.					
22. I drank because I felt lonely.					
23. Drinking helped me cope with life's failures.					
24. I spent a great deal of time trying to obtain alcohol.					
25. I had trouble maintaining established relationships because of my drinking.					
26. I experienced intense thoughts about the need to drink.					
27. I felt I needed to drink more to reach my desired state (e.g., get drunk, feel relaxed, ability to be social).					
28. Drinking helped me cope with my physical difficulties.					
29. I received bruises or scratches as a result of drinking.					
30. I drank frequently (6-7 days a week).					
31. I drank to decrease my fear of death.					
32. I experienced memory problems when drinking.					
33. I spent less time with family in order to drink.					
34. I was unsuccessful in my attempts to decrease drinking.					
35. I felt sick after a period of not drinking.					
36. I felt a strong urge or desire to drink alcohol.					

37. I fell while under the effects of alcohol.					
38. I spent less time with my romantic partner in order to drink.					
39. I drank to decrease feelings of worry.					
40. I spent a great deal of time thinking about alcohol.					
41. I chose to drink over fulfilling my responsibilities.					
42. I experienced difficulties with sweating after a period of not drinking.					
43. Drinking helped me cope with my loss of independence in life.					
44. I had trouble attending healthcare appointments because of my drinking.					
45. I experienced headaches after a period of not drinking.					
46. I failed to fulfill promises to others because of my drinking.					
47. Drinking helped me cope with my difficulties with remembering.					
48. I experienced problems with my romantic partner because of my drinking.					
49. Drinking helped me cope with loss of friends or family.					
50. I experienced fewer pleasurable effects from drinking large quantities of alcohol.					
51. Drinking decreased my experiences with shakiness or tremors.					
52. I felt helpless in fighting the urge to drink.					
53. I drank because I felt alone in this world.					
54. I could not find a reason to halt my drinking habits.					
55. I could see a point in time where I could give up drinking.					
56. I felt it was easier to drink than to manage my emotions.					

57. I felt like drinking was a part of who I am.					
58. Drinking helped me cope with my inability to meet my goals.					
59. I thought less of myself because I could not stop drinking.					
60. I experienced physical discomfort when I tried to stop drinking.					

APPENDIX 2

Revised Items of AMSOA

Items	0 (Never or Not Related)	1 (Rarely)	2 (Sometimes)	3 (Often)	4 (Always)
2. I intended to get drunk when drinking.					
4. I have required extra healthcare 5. services (e.g., doctor appointments, hospitalization) because of my drinking.					
5.I drank excessively (3 or more alcoholic beverages per sitting).					
7. I felt disappointed that it took so much alcohol for me to det drunk.					
10. I continued to drink even though I had other health issues (e.g., diabetes, high blood pressure, congestive heart failure, liver problems, osteoporosis).					
12. I had difficulties attending work on time.					
14. I drank to decrease sadness.					
16. I spent a great deal of time trying to get sober from drinking.					
18. I had trouble developing new relationships because of my drinking.					
19. My physical pain was easier to manage after drinking.					
20. I experienced problems with friends because of my drinking.					
22. I drank because I felt lonely.					
24. I spent a great deal of time trying to obtain alcohol.					
25. I had trouble maintaining established relationships because of my drinking.					
29. I received bruises or scratches as a result of drinking.					
30. I drank frequently (6-7 days a week).					
31. I drank to decrease my fear of death.					

35. I felt sick after a period of not drinking.				
36. I felt a strong urge or desire to drink alcohol.				
38. I spent less time with my romantic partner in order to drink.				
39. I drank to decrease feelings of worry.				
42. I experienced difficulties with sweating after a period of not drinking.				
43. Drinking helped me cope with my loss of independence in life.				
44. I had trouble attending healthcare appointments because of my drinking.				
45. I experienced headaches after a period of not drinking.				
46. I failed to fulfill promises to others because of my drinking.				
47. Drinking helped me cope with my difficulties with remembering.				
48. I experienced problems with my romantic partner because of my drinking.				
51. Drinking decreased my experiences with shakiness or tremors.				
52. I felt helpless in fighting the urge to drink.				
55. I could see a point in time where I could give up drinking.				
56. I felt it was easier to drink than to manage my emotions.				
58. Drinking helped me cope with my inability to meet my goals.				
60. I experienced physical discomfort when I tried to stop drinking.				