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Williams Hierarchical Integrated Model Measurement: Assessment Design, Construction, and Initial Validation

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**WILLIAMS HIERARCHICAL INTEGRATED MODEL MEASUREMENT:
ASSESSMENT DESIGN, CONSTRUCTION, AND INITIAL VALIDATION**

A Dissertation

Presented to

The Faculty of the School of Education

The College of William and Mary in Virginia

In Partial Fulfillment

Of the Requirements for the Degree

Doctor of Philosophy

by

Amy Elizabeth Williams

February 2016

**WILLIAMS HIERARCHICAL INTEGRATED MODEL MEASUREMENT:
ASSESSMENT DESIGN, CONSTRUCTION, AND INITIAL VALIDATION**

by

Amy Elizabeth Williams

Approved February 2016 by

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Sara A. Scott, Ph.D.

Dedication

This work is dedicated to my sister, Emily Ann Williams

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**WILLIAMS HIERARCHICAL INTEGRATED MODEL MEASUREMENT:
ASSESSMENT DESIGN, CONSTRUCTION, AND INITIAL VALIDATION**

Abstract

The purpose of this study was to design and pilot an instrument, the WHIMM, that uses the Williams Hierarchical Integrated Model as a foundation for measuring needs met within and outside of substance use for individuals age 18 and older who report previously considering cutting down on alcohol or drug use. Instrument construction and validation were completed using a first pilot ($n=200$), a pilot one-re-contact ($n=50$), and a final administration ($n=420$). The scale development process allowed for initial validation of the WHIMM, including measurement of inter-item reliability, test-retest reliability, correlation between subscales, and construct validity. In addition, a scoring metric was developed to allow an individual's WHIMM results to be interpreted based upon the national normative sample used for the present study.

The overall WHIMM and each of the subscales for the Global and Substance Use forms yielded Cronbach's alpha inter-item reliability coefficients equal to or greater than .90. Test-retest reliability for the WHIMM Global and Substance Use forms was generally adequate with the majority of subscales producing a minimum test-retest reliability coefficient of .70. The construct validity tests of the WHIMM demonstrated that the constructs measured by the WHIMM differ substantially from the constructs that are measured by the Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) and Drug Abuse Screening Test (DAST; Skinner, 1982). Exploratory factor analysis loosely supported the Williams Hierarchical Integrated Model's discrete but interrelated elements. There were statistically-significant

differences between scores on the WHIMM Global and WHIMM Substance Use forms.
Implications, limitations, and suggestions for future research are also presented.

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**WILLIAMS HIERARCHICAL INTEGRATED MODEL MEASUREMENT:
ASSESSMENT DESIGN, CONSTRUCTION, AND INITIAL VALIDATION**

CHAPTER ONE

INTRODUCTION

Within mental health treatment fields generally and particularly within the field of substance use disorder treatment, there is an ongoing need for evidence-based practices (EBPs) supported by data, research, and intervention-to-client fit (Glasner-Edwards & Rawson, 2010). These evidence-based practices are guided by research studies that assess the efficacy of treatment modalities for use with clients with substance use disorders; research ranging from randomized-controlled clinical trials to case studies all inform—with differing degrees of impact—the acceptance of a practice as evidence-based (Miller, Zweben, & Johnson, 2005).

Within the realm of evidence-based practice, assessment of client functioning, need-based motivation, and self-efficacy are essential elements of determining effective interventions; indeed, the impact of treatment on each and all of these areas is likely to be measured to support designation of an intervention as evidence-based. Current conceptual frameworks and allied assessment instruments provide information on client characteristics including the frequency and quantity of substance use (Babor, Higgins-Biddle, Suanders, & Monteiro, 2001; Skinner, 1982), consequences experienced as a result of substance use (Alterman, Cacciola, Ivey, Habing, & Lynch, 2009), and motivation to change problematic substance use patterns (DiClemente, CC, Carbonari, Zweben, Morrle, & Lee, 1990; Miller & Tonigan, 1990). Current best-practice models

including the American Society of Addiction Medicine (ASAM) criteria for assessment and placement in substance use disorder treatment, diagnostic criteria for substance use disorders found in the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5), and associated interview and assessment protocols take into consideration factors including biological, psychological, social, and spiritual elements that may impact overall wellbeing and become exacerbated by problems associated with substance use disorders (American Psychiatric Association [APA], 2013; American Society of Addiction Medicine [ASAM], 2013; Hatala, 2013; Juhnke & Hagedorn, 2006; Scoles, 2009). Nonetheless, these discrete conceptual frameworks and associated assessment processes fail to consider these complimentary components as a unified whole. As a result they neglect the interactions that exist within *and* between the domains of functioning, need-based motivation, and self-efficacy despite the impact these have on the development of substance use disorders and the impact that substance use disorders have within and across all of these domains.

Statement of the Problem

As stated previously, there is an ongoing need for evidence-based practices informed by data, research, and intervention-to-client fit (Glasner-Edwards & Rawson, 2010). Current assessment instruments provide information on substance-use related characteristics (e.g., frequency, quantity, consequences, concurrent medical/psychological factors), but generally fail to consider these elements in relation to overall needs being met or not met both through and outside of substance use. Most reflective of this gap in the research is the absence of any assessment instrument focused

upon needs met through substance use that could be located by the author of the present study.

Understanding needs met by an individual through substance use, needs met by an individual outside of substance use, and self-efficacy of an individual related to his or her perceived ability to meet needs without engaging in substance use may powerfully inform case conceptualization and subsequent selection of treatment interventions. As an example, information obtained through the Williams Hierarchical Integrated Model Measurement (WHIMM) may be used to select interventions that target self-efficacy and motivation, such as Motivational Interviewing (Miller & Rollnick, 2012), for individuals with low self-efficacy surrounding meeting needs outside of substance use. For individuals with differing levels of self-efficacy across different need areas, it may be possible to access areas of relative strength to support development of self-efficacy in areas of need in addition to supporting overall development of self-efficacy through motivational enhancement techniques.

Conversely, for individuals who have a specific need that is met through substance use (e.g., belongingness needs) with other needs fulfilled outside of use (e.g., physiological and safety needs), interventions may specifically target connecting the individual to alternatives for meeting the identified need through means other than substance use. Techniques for identifying and accessing strengths to address needs may also be useful within this context.

In addition, the WHIMM, built around the Williams Hierarchical Integrated Model, may be useful in determining the level or nature of treatment needed by an individual (e.g., inpatient treatment versus outpatient treatment). A cohesive model that

integrates functioning, need, and motivation coupled with an instrument that integrates the measurement of these factors through a single assessment may serve as useful and efficient means for data collection that may also streamline the process of determining treatment need and facilitating timely and appropriate interventions for individuals engaging in problematic substance use.

The Williams Hierarchical Integrated Model—the model upon which the assessment instrument is built—aligns with the biopsychosocial-spiritual model, the currently-accepted medical model that guides substance use disorder treatment (Adler, 2009; Engel, 1977; Hatala, 2013) and also roughly aligns with current diagnostic and placement criteria for substance use disorders (APA, 2013; ASAM, 2013). A thorough description of this model is included in Chapter Two.

Current assessment instruments for constructs typically measured related to substance use fail to comprehensively assess an individual's needs met through substance use, needs met outside of substance use, and self-efficacy for meeting these needs. The WHIMM may allow for multifaceted assessment of a complex disease and may support the identification of both strengths and needs of individuals engaging in problematic substance use. This may make the WHIMM a useful tool for informing treatment practices, assessing progress in treatment, and streamlining assessment processes with a single assessment instrument that addresses multiple multidimensional factors simultaneously. Future applications of this instrument may include conducting research surrounding clinical profiles of individuals engaging in problematic substance use, measuring the impact of interventions on the constructs measured through the WHIMM,

and selecting EBPs through treatment-to-client match based upon data obtained through this assessment instrument.

Overall, the WHIMM integrates multidimensional factors impacting and impacted by substance use. This may help those who use the instrument to identify strengths and needs of individuals engaging in problematic substance use and may inform treatment planning based upon the client's specific needs and beliefs about his or her ability to meet these needs. Future applications of the WHIMM may include exploring client characteristics, assessing treatment effectiveness, and using data to support thoughtful application of EBPs to specific client need areas and areas of strength.

Purpose of the Study

This study involved the construction of an assessment instrument intended to be administered to individuals currently engaging in problematic substance use. The WHIMM was designed to measure needs met through substance use and needs met outside of substance use, conceptualized through the lens of Maslow's hierarchy of needs and adapted structurally to also align simultaneously with the biopsychosocial-spiritual model. The instrument was also designed to measure an individual's self-efficacy related to meeting his or her needs in each need domain.

Research Questions

The following research questions guided the development of the assessment instrument and the analysis of the instrument based upon data collection:

1. Do the instrument's reliability coefficients meet the standard of .80 or greater?

2. Does factor analysis of data obtained following final instrument administration yield distinct factors that support the Williams Hierarchical Integrated Model's discrete elements and overall framework?
3. Are there differences between an individual's responses to analogous subscales on the WHIMM when one subscale references substance use and the other references global experience for individuals who are currently engaging in problematic substance use?

CHAPTER TWO

Definition and Prevalence of Substance Use Disorders

Substance use disorders, as defined by the Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5), involve the use of one or more mood-altering substances to the extent that a range of use-related symptoms are experienced (APA, 2013). These symptoms include increased frequency or quantity of substance use, unsuccessful efforts to control use, increased amount of time spent in use-related activities, the presence of cravings to use, negative impact of use on functioning within physiological, psychological, or social domains, ongoing use despite negative consequences, and the presence of tolerance or withdrawal symptoms. (APA, 2013). Substance use disorders may range from mild, with a presence of two to three of the identified 11 total symptoms, to moderate, with the presence of four to five of these symptoms, to severe, with a presence of six or more of the 11 substance-use related symptoms (APA, 2013).

Both substance use generally and substance use disorders specifically remain an ongoing public health concern. In 2013, 24.6 million individuals age 12 and over reported current use of illicit drugs (Substance Abuse and Mental Health Services Administration [SAMHSA], 2014). In this same survey, over half of the American population—52.2% of individuals age 12 and older—reported current alcohol use and 22.9% of Americans age 12 and older reported current binge alcohol use. These percentages represent approximately 136.9 million Americans and 60.1 million

Americans, respectively (SAMHSA, 2014). Despite the ongoing public health concerns related to problematic substance use, treatment remains underutilized, with only 2.5 million of the 22.7 million individuals age 12 or older in need of treatment receiving substance use disorder treatment in a substance use treatment facility in 2013 (SAMHSA, 2014).

Need for an Integrated Conceptual Model of Functioning, Drive, and Motivation Applicable to Substance Use Disorders

The field of psychology is grounded in the study of human thought, emotion, and behavior (American Psychological Association, 2015). Within this broad field, a research-based model exists to describe human functioning across biological, psychological, social, and spiritual domains (Adler, 2009; Engel, 1977; Hatala, 2013). A separate research-based model exists to describe human motivation grounded in need salience within and across physiological, safety, belonging, esteem, self-actualization, and self-transcendence domains (Maslow, 1943; Maslow, 1962). Another research-based model describes the principles of and processes involved in self-efficacy, or relationships between expectations of success, importance of success, effort expenditure, and task persistence when presented with obstacles to successful task completion (Bandura, 1977). To date, however, no extant model provides an integrated, unified view of the relationships between and processes within these three domains.

The Williams Hierarchical Integrated Model is an integrated conceptual model that considers the interconnected processes of human functioning across biological, psychological, social, and spiritual domains (Adler, 2009; Engel, 1977; Hatala, 2013), need salience within and across physiological, safety, belonging, esteem, self-

actualization, and self-transcendence domains (Maslow, 1943; Maslow, 1962), and principles and processes of self-efficacy, or relationships between expectations of success, importance of success, effort expenditure, and task persistence (Bandura, 1977) as a unified framework. This framework may provide new ways of viewing the interactional processes of functioning, need-based motivation, and self-efficacy globally and may also positively inform and impact practitioners' assessment of and interventions for individuals who are in need of supportive services.

This model may be particularly relevant for conceptualization and treatment of individuals engaging in problematic alcohol or other drug use. Problematic substance use manifests within and across domains of functioning, need-based drive, and motivation in varying and profound ways (APA, 2013; ASAM, 2013; Brooks & McHenry, 2009; Juhnke & Hagedorn, 2006; Meyers, 2015; Miller & Rollnick, 2012; Scoles, 2009). Specific applications and implications of this model for working with individuals with substance use disorders reflect the utility of this model to inform assessment and intervention with this population.

Components of the Integrated Conceptual Model of Functioning, Drive, and Motivation

Each of the elements that contribute to the Williams Hierarchical Integrated Model lends important factors to the overall conceptual model. While the biopsychosocial-spiritual model provides the skeleton that describes the global domains of human functioning, Maslow's Hierarchy of needs serves as the cartilage that flexibly supports the framework through the addition of six drive-based needs that reflect a combination of deficiency and growth needs within the four broad domains of the

biopsychosocial-spiritual model. Finally, Bandura's model of self-efficacy serves as the muscle, through which movement toward change and improved wellbeing becomes actualized. Self-efficacy imbues the six drive-based elements of Maslow's hierarchy, which in turn found the four broad domains of the biopsychosocial-spiritual model. Each of these elements is described in further detail below. The implications of each to the overall Williams Hierarchical Integrated Model are also discussed.

Biopsychosocial-Spiritual Model

The biopsychosocial-spiritual model is the currently-accepted medical model for conceptualizing functioning within and across biological, psychological, social, and spiritual domains (Adler, 2009; Engel, 1977; Hatala, 2013). Each element is interrelated and interconnected to the other elements of the model, and attention to each is considered necessary to fully capture the holistic picture of overall functioning (Adler, 2009; Engel, 1977; Hatala, 2013). Although the elements are interconnected, each attends to specific areas of functioning that impact overall wellbeing.

Biological elements and implications. The biological elements of the biopsychosocial-spiritual model include elements essential to physiological functioning, health, and disease (Adler, 2009; Engel, 1977; Hatala, 2013). Genetics, physiological processes such as digestion, the response of the autonomic nervous system, and endocrine and hormone functioning are all components of this domain (Hatala, 2013). Neurochemical processes are also contained within the biological domain. These neurochemical processes also highlight the interconnectedness of the elements of the biopsychosocial-spiritual model. Specifically, Chambers, Bickel, & Potenza (2007) found that neurochemical processes created neurochemical motivational pathways that

were differentiated depending on need, with many pathways linked through the same hub. Additional research findings demonstrated that satiation of basic needs, physical health, and neurochemical processes all impacted manifestations of wellness and illness (Zittel, Lawrence & Wodarski, 2002). The implied reciprocal influence between psychological and social elements and these biological processes underscores the interconnectedness of the elements of the biopsychosocial-spiritual model and demonstrates the utility of each element in contributing to the overall wellbeing of an individual.

Psychological elements and implications. The psychological component of the biopsychosocial-spiritual model includes cognitive and affective processes and affective feedback loops, including stress-based responses to actual or perceived threats (Hatala, 2013). The interconnection between elements of the biopsychosocial-spiritual model is again seen in the relationships between stress responses and other domains of biopsychosocial-spiritual functioning. Specifically, researchers demonstrated that anxiety, stress, fear, and hostility impacted neurotransmitters and physiological responses (Zittel et al., 2002). Stress response was also found to affect the functioning of the immune system and to impact engagement in unhealthy coping mechanisms, including substance abuse (Zittel et al., 2002). Researchers of this study also identified that an individual's perceived locus of control (a cognitive process) was positively related to health status, as participants with an internal locus of control exhibited better health compared to participants with an external locus of control (Zittel et al., 2002). In addition to demonstrating the interconnection of the biopsychosocial-spiritual elements, this study

also implicated motivation as a force that may underlie the biopsychosocial-spiritual model as a whole.

Social elements and implications. The social component of the biopsychosocial-spiritual model includes activities of daily living, interpersonal and family relationships, social support systems, employment or educational environments, and other community-based environments and interactions with which an individual may engage (Hatala, 2013). In addition to these elements, the social domain also includes environmental stress, social expectations, and cultural factors and norms, as both macrocultural and microcultural elements have been found to impact individual functioning (Hatala, 2013). The implied connection between social factors and psychological factors including affective and cognitive responses both to stressors and to positive and beneficial relationships again highlights the interdependence of the elements of the biopsychosocial-spiritual model.

Spiritual elements and implications. The spiritual domain of the biopsychosocial-spiritual model includes spiritual practices such as prayer, meditation, and exploration of life's meaning and purpose (Hatala, 2013). In addition, under some circumstances, engagement in health-promoting behaviors and involvement in social support networks may also be considered spiritual practices (Hatala, 2013). The addition of spirituality to the biopsychosocial-spiritual model reflects acknowledgement that spiritual practices have both direct and indirect impacts on overall health and wellbeing (Hatala, 2013). Specifically, researchers found that spirituality impacted cognitive processes, emotional wellbeing, quality of life, and patient outcomes (Powell, Shahabi, & Thoresen, 2003; Zittel et al., 2002). Zittel and colleagues (2002) also found that

spirituality promoted self-efficacy, which positively impacted study participants' health and views of control over health. Additionally, engagement in spiritual practice was found to impact both individual health and sociocultural wellbeing as well as to influence community resilience and group empowerment (Hatala, 2013). Through the spiritual domain, the interconnections between each of the elements of the biopsychosocial-spiritual model are elucidated, and again, motivation—in the form of self-efficacy—is noted as a possible underlying element that influences the whole of functioning within the biopsychosocial-spiritual model.

Maslow's Hierarchy of Needs

Maslow's hierarchy of needs describes six domains—physiological, safety, belongingness, esteem, self-actualization, and self-transcendence—within which human perception of need and drive to meet these needs are activated (Koltko-Rivera, 2006; Maslow, 1943; Maslow, 1962). In addition to defining each of these needs discretely, Maslow also clustered the needs into two categories, deficiency needs and growth needs, to differentiate between the needs that directly impact survival and those that are, according to Maslow, emergent only when deficiency needs are met (Maslow, 1962; Noltemeyer, Bush, Patton, & Bergen, 2012). Although Maslow originally defined these needs in global, rather than operational, terms (Goebel & Brown, 1981), the operationalization of Maslow's need categories has been supported in varying degrees through research. (Betz, 1984; Goebel & Brown, 1981; Haymes & Green, 1982; Lawler & Suttle, 1972; Mitchell & Moudgill, 1976; Saeednia, 2011; Strong & Fiebert, 1987; Wahba & Bridwell, 1976; Wanous & Zwany, 1977).

Maslow's six levels of need. The first of Maslow's need domains, physiological needs, is related to biological survival and includes the attainment of food, water, shelter, and clothing as well as freedom from illness or disease (Maslow, 1943; Maslow, 1962). According to Maslow (1943/1962), physiological needs must be satisfied in order for the next level of need to gain prepotency. This second level, safety needs, includes physical and emotional safety and security at both individual and societal levels (Maslow, 1943; Maslow, 1962). Individuals who live in environments where the need for physical and psychological safety cannot be met will remain focused on meeting this need as a primary goal (Maslow, 1943; Maslow, 1962). When the need for safety is satiated, Maslow's next level of need, belongingness, gains prepotency (Maslow, 1943; Maslow, 1962). Belongingness, according to Maslow (1943/1962), includes group affiliation, which may fall into familial, interpersonal, cultural, organizational, or societal connections with others. When belongingness needs are met, the next need to gain prepotency, according to Maslow (1943/1962), is the need for esteem. Within Maslow's hierarchy, esteem needs are met through receiving recognition and attaining achievement for personal or professional accomplishments (Maslow, 1943; Maslow, 1962).

Self-actualization, Maslow's next level of need (1943/1962), emerges as an individual is drawn to fulfill personal potential. This need may be pursued and met in varying ways depending upon the individual's personal perspectives, goals, and ideals (Maslow, 1943; Maslow, 1962). The sixth need in Maslow's hierarchy, self-transcendence, often fails to appear in descriptions of Maslow's hierarchy (Koltko-Rivera, 2006). Nonetheless, Maslow's pinnacle need emerges when an individual is drawn to pursue causes that transcend the individual, when the individual engages with

the world and expands belief systems beyond what is known and can be personally experienced, and when the individual becomes open to experiencing and making meaning of peak experiences (Maslow, 1962; Koltko-Rivera, 2006).

Deficiency needs and growth needs. Maslow's Hierarchy of needs divides the six levels of need described above into two categories: deficiency needs and growth needs (Maslow, 1943; Maslow, 1962; Noltemeyer et al., 2012). Although both categories of need are related to drive states, there are clear distinctions between the two categories. Specifically, when deficiency needs, which generally include physiological, safety, and belonging needs, are not met, the individual's attention is singularly focused on meeting the most salient need; when this need is met, the focus shifts to meet the next emergent deficiency need (Maslow, 1943; Maslow, 1962). For example, when an individual experiences hunger, the primary focus of the individual is satiation of hunger. When an individual is not hungry, though, attention will be focused upon other more salient needs. This tendency, according to Maslow, holds true for each of the deficiency needs (Maslow, 1943; Maslow, 1962).

In contrast to the deficiency needs, which emerge with some degree of predictability, Maslow describes growth needs as needs that may motivate an individual to continue exerting energy to pursue meeting these needs even when the initial drive to meet the need is satiated (Maslow, 1943; Maslow, 1962). These growth needs, which include esteem, self-actualization, and self-transcendence, may be experienced differentially by different individuals and, for some individuals such as those struggling to meet basic needs, may not ever emerge to prepotency (Maslow, 1943; Maslow, 1962).

In general terms, the emergence of growth needs depends on a solid foundation of satisfied basic needs in order to reach levels of salience (Maslow, 1943; Maslow, 1962).

The triangle shape and Maslow's hierarchy of needs. In spite of much anecdotal evidence to the contrary, Maslow never used a triangle shape to describe his hierarchy of needs (Maslow, 1943; Maslow, 1962; Saeednia, 2010). Review of Maslow's original works (Maslow, 1943; Maslow, 1962) provides no evidence to suggest that Maslow intended for his hierarchy to be superimposed upon a triangle. This observation is supported by critical review of Maslow's conceptualization of his hierarchy of needs. First, the triangle shape fails to adequately describe the interdependence and potential for overlap among the six levels of need, which Maslow himself described (Maslow, 1943; Maslow, 1962; Saeednia, 2010). For example, an individual who strives to meet safety needs may do so by affiliating with a group that offers protection, which also serves to meet the need for belonging. Similarly, an individual who is striving to meet esteem needs is likely to require individuals from whom to seek recognition. As a result of the interdependence of these needs, the triangle—which typically also fails to include self-transcendence as the sixth need described by Maslow (Koltko-Rivera, 2006)—does not adequately or accurately describe the relationships among and between the needs described by Maslow (Saeednia, 2010).

Critiques of Maslow's hierarchy of needs. Although Maslow's hierarchy of needs provides a well-organized and clear perspective on human drives and needs, some critics of the theory question the construct validity of Maslow's model. Mitchell and Moudgill (1976), failed to observe separation of deficiency and growth needs through the process of exploratory factor analysis; instead, their factor analyses yielded distinct

factors for “security, social, esteem, autonomy, and self-fulfillment categories” (p. 334), with the factors separating security needs from the higher-order needs when the factor structure was set to discern only two factors. This study’s sample included a total of 892 professional accountants, engineers, and scientists residing in Canada. The homogenous sample presents a limitation related to this study, particularly given the potential impact that socio-economic status may have on an individual’s responses to constructs included in Maslow’s hierarchy. This coupled with the instrument’s inclusion of only items related to career-based needs rather than overall needs in all domains of functioning represent limitations of this study that may have influenced the findings and the conclusions drawn about the viability of Maslow’s hierarchy.

In contrast, Noltemeyer, Bush, Patton, and Bergen (2012) found that variables focused on deficiency needs and variables focusing on growth needs formed separate factors through the process of exploratory factor analysis. Further, the researchers also demonstrated that attainment of deficiency needs was related to attainment of growth needs through the process of regression analysis (Noltemeyer, Bush, Patton, & Bergen, 2012). The sample for this study included 389 elementary school students ranging from kindergarten through sixth grade from a single Midwestern county in the United States. Although these findings suggest distinctions between deficiency needs and growth needs and support the notion of a hierarchical relationship between these two need categories, the homogenous geographic representation of the sample is a limitation that must be considered. The operationalization of Maslow’s hierarchy in this study attended to a balance of global and academic domains, making the instrument itself applicable to multiple domains of functioning.

Haymes and Green (1982) conducted a study using a needsort technique that included items for Maslow's physiological, safety, belongingness needs. A total of 684 individuals including a combination of undergraduate and graduate students participated in the study. This study used exploratory factor analysis within each need category, rather than with all variables together, to uncover factors within each category. The researchers obtained results that support the hierarchical structure of the need categories included in the study. As a result of the lack of attention to empirically supporting the division of three separate need domains coupled with failure to include growth needs in the instrument, this study's limitations impact the degree to which inferences about the whole of Maslow's hierarchy can be made.

Wahba and Bridwell (1976) studied the discrepant findings among studies seeking to validate Maslow's hierarchy. They described inadequate or incomplete operationalization of Maslow's constructs, inadequate sample size and representativeness, and poor instrumentation of the constructs under study as limitations that impacted many studies focused on supporting Maslow's hierarchy as a theoretical model (Wahba & Bridwell, 1976). Studies reviewed by the researcher for the present study demonstrated arbitrary construction of items and assignment to a need category without the use of empirical procedures to justify category placement (Goebel & Brown, 1981; Lester, 1990; Strong & Fiebert, 1987); the use of instruments focusing upon one specific domain of functioning such as professional or academic functioning to the exclusion of global functioning (Freitas & Leonard, 2011; Mitchell & Moudgill, 1976); poor construct sampling evidenced by a lack of the inclusion of all six need domains in any instrument developed to measure Maslow's hierarchy of needs; and limited

generalizability of findings based upon sampling procedures (Betz, 1984; Goebel & Brown, 1981; Freitas & Leonard, 2011; Haymes & Green, 1982; Lawler & Suttle, 1972; Leister, 1990; Mitchell & Moudgill, 1976; Saeednia, 2011; Strong & Fiebert, 1987; Wanous & Zwany, 1977).

The concern stemming from possible limitations in instrumentation and study design for analyzing the constructs Maslow described leads directly to another concern cited by critics of Maslow's model. As a result of Maslow's intentionally vague language surrounding his constructs, the theory is difficult to operationalize, and thus may also be difficult to measure accurately (Wanous & Zwany, 1977). Maslow's intentional focus on the individual, informed by a humanistic perspective that demarcated a movement away from a deficiency-based medical model (Goebel & Brown, 1981), while commendable from a practitioner standpoint, poses a challenge for researchers who desire to collect data to support Maslow's theory. As a result, no instrument has successfully operationalized all of Maslow's constructs including self-transcendence (excluded from all instruments reviewed by this author) simultaneously, and most efforts toward this end have occurred within a specific domain, such as career assessment (Haymes & Green, 1982; Sadeenia, 2011; Williams & Page, 1989). This presents limitations both in terms of the validity of research findings related to Maslow's constructs as operationalized by researchers and in terms of the generalizability of these findings to global areas of human functioning (Williams & Page, 1989). Although more recent research adequately operationalized elements of Maslow's hierarchy to apply to such areas as national wellbeing (Hagerty, 1999) and deficiency and growth needs of students enrolled in public schools (Noltmeyer, Bush, Patton, & Bergen, 2012), the six

individual needs described by Maslow have been inconsistently operationalized to inform research at the individual level (Sadeenia, 2011; Williams & Page, 1989; Koltko-Rivera, 2006).

Some of the challenge of construct operationalization stems from Maslow's clustering of different specific needs together into the six broad categories he identified (Kenrick, Griskevicius, Neuberg, & Schaller, 2010). In addition, some researchers propose that self-actualization, rather than being a separate need, may be functionally indistinct from other needs identified by Maslow (Kenrick, Griskevicius, Neuberg, & Schaller, 2010). Although individuals who have strived to operationalize Maslow's hierarchy have necessarily interpreted his writings to construct operational definitions for each of the need categories, these inconsistencies in defining Maslow's constructs warrant consideration in assessing the utility and validity of Maslow's Hierarchy of needs.

Support for and implications of Maslow's hierarchy of needs. As Maslow's Hierarchy of needs has undergone critical analysis throughout its lifespan, several researchers have identified evidence that supports the model as a valid mechanism for conceptualizing human drive-based motivation. Researchers identified multiple mechanisms that impact behavior, including the behavior's evolutionary function, its purpose within the overall developmental sequence of the individual, and the cognitive priority given to the action and its outcomes (Kenrick, Griskevicius, Neuberg, & Schaller, 2010). These findings lend support to Maslow's theory, which proposes that survival-based needs are prioritized over growth needs. The hierarchy's general structure suggesting prepotency of survival-based needs, that, when satiated, allow the individual

to attend to needs that are growth-focused is supported by findings in neuroscience, biology, and motivation theory and is consistent with research findings in these fields (Kenrick et al., 2010).

In addition to the existence of research providing supporting evidence for Maslow's hierarchy at an individual level, researchers also described the utility of Maslow's hierarchy of needs as applicable to collective groups of individuals. Specifically, researchers demonstrated the connection between needs met and wellbeing, and this finding held across cultures and nations (Tay & Diener, 2011). Interestingly, Tay and Diener (2011) also found that a nation's overall need satiation impacts the individual citizen's wellbeing. For example, a nation that struggles to meet its need for safety due to ongoing warfare will exhibit, in individual citizens, increased attention to safety-based needs with a concordant impact on the individual's wellbeing (Tay & Diener, 2011). Maslow's model has also been applied to conceptualizing a nation's overall wellbeing in terms of national needs met (Hagerty, 1999). As a result of these research findings, consideration of the applicability of Maslow's Hierarchy of needs at both the individual and national levels remains a relevant aim.

Finally, researchers found a relationship between needs met as defined by Maslow's hierarchy and internal locus of control (Lester, Hvezda, Sullivan, & Plourde, 1983). Locus of control as an underlying principle has, as mentioned previously, also been implicated as relevant to the overall wellbeing of individuals within the context of the biopsychosocial-spiritual model. Need-based drive and motivation are distinct in nuanced ways, and this finding alludes to the importance of additional motivational

factors that may influence an individual's pursuit of and achievement in meeting needs as described by Maslow.

Bandura's Self-Efficacy Theory

Within his theory of self-efficacy, Bandura (1977/1982) described cognitive mechanisms that influence behavior. Specifically, Bandura (1977/1982) explained that expectations of success with a given undertaking influence task pursuit, task commitment, and engagement of coping behaviors necessary to achieve task completion. Bandura (1977/1982) identified four sources of information that inform beliefs about an individual's self-efficacy with a given pursuit: performance accomplishments, vicarious experience, verbal persuasion, and physiological states. Performance accomplishments, according to Bandura (1977/1982), are previous attempts—successful or unsuccessful—to complete the task at hand. Vicarious experience, according to Bandura (1977/1982), is informed by observing others negotiate and complete a given task. Verbal persuasion, according to Bandura's (1977/1982) theory, involves consideration by the individual of others' feedback on the individual's ability to successfully complete the task. Physiological states, which include states of arousal and drive-based states, are identified by Bandura (1977/1982) as a final element that influences self-efficacy. These four elements may influence an individual's overall perception of self-efficacy differentially and may be differentially influential in specific situations for a given individual (Bandura, 1977; Bandura, 1982).

Based upon these influences, Bandura (1977/1982) identified that, as an individual's perception of the dependability of a situation and his or her perception of personal dependability to successfully perform in a situation increase, self-efficacy in

task completion also increases. This self-efficacy may generalize to similar tasks and domains, but it does not generalize across all tasks and domains of functioning (Bandura, 1977; Bandura, 1982). As an example, if an individual has high self-efficacy for taking multiple-choice exams in English classes, this may generalize to high self-efficacy for taking multiple-choice exams in writing classes, or for taking matching and true-false exams in English classes, while it would not impact self-efficacy related to taking multiple-choice exams in mathematics or science classes, or taking essay exams in any classes. These patterns of generalization are individualized and may be idiosyncratic based upon the individual's prior experiences and specific sources of self-efficacy (Bandura, 1977; Bandura, 1982).

Applications and implications of self-efficacy. Bandura identified a relationship between self-efficacy and behavior change (Bandura, 1977; Bandura, 1982; Bandura, 1999; Bandura & Locke, 2003; Bandura, Resse, & Adams, 1982). Researchers also identified that low self-efficacy is connected to anxiety and defensive behavior (Bandura & Locke, 2003; Bandura et al., 1982). Additionally, stress-based reactions, self-regulation, striving for achievement, intrinsic interest, and pursuit of activities that promote growth were found by researchers to be impacted by an individual's self-efficacy (Bandura, 1977; Bandura, 1982; Bandura, 1999; Bandura & Locke, 2003; Bandura et al., 1982; Wiedenfeld, O'Leary, Bandura, Brown, Levine, & Raska, 1990). Bandura and colleagues also found that self-efficacy impacted stress management, an individual's ability to cope with anxiety, phobias and other stressors, and physiological responses to stress (Bandura & Locke, 2003; Bandura et al., 1982; Wiedenfeld et al., 1990). Additional research identified that collective self-efficacy, or the self-efficacy of a

group of which the individual is a member, may promote individual self-efficacy (Bandura, 2000). Researchers also found that supporting and promoting self-efficacy in individuals may increase task completion, attainment of goals, commitment to change, and overall wellbeing (Bandura, 1977; Bandura, 1982; Bandura, 1999; Bandura & Locke, 2003; Bandura et al., 1982; Miller & Rollnick, 2012).

In addition to these findings, Bandura and colleagues also identified the impact of self-efficacy on biological markers, including the neurochemicals norepinephrine and dopamine (Bandura & Locke, 2003; Bandura et al., 1982; Wiedenfeld et al., 1990). In this study, researchers also found that self-efficacy impacted psychological factors including stress response and coping behaviors. Interestingly, spiritual practice has also been connected to self-efficacy (Zittel et al., 2002). These findings suggest that self-efficacy may be both directly and indirectly related to elements of both the biopsychosocial-spiritual model and Maslow's hierarchy of needs, and may serve as an essential but unnamed component in cultivating motivation to change and promoting wellbeing across and within domains in each of these models.

Application of the Biopsychosocial-Spiritual Model, Maslow's Hierarchy, and Self-Efficacy to Substance Use Disorders

Each of the theories and models described has demonstrated utility in the assessment and treatment of substance use disorders. Specifically, elements of the biopsychosocial-spiritual model, Maslow's hierarchy of needs, and Bandura's self-efficacy theory have been applied directly to conceptualizing and treating substance use disorders. Although these models have been discretely applied within this context, the potential for synergistic interaction becomes apparent upon further exploration of the

individual applications of these models to substance use disorder conceptualization and treatment.

Biopsychosocial-Spiritual Model

The biopsychosocial-spiritual model aligns with both the DSM-5 (APA, 2013) and the American Society of Addiction Medicine (ASAM, 2013) models of diagnosis and treatment of substance use disorders. The biopsychosocial-spiritual model is regarded as the current best practice for assessing and treating substance use disorders in a contextual and individualized way (Juhnke & Hagedorn, 2006; Scoles, 2009; Wallace, 1993). Chambers, Bickel and Potenza (2007) found that the neurochemical motivational pathways described earlier may be reinforced through substance use, with alternate pathways for motivation becoming extinguished through chronic substance use. Additional neurochemical processes, including those that involve transmission of glutamate and dopamine, have been implicated in addictive processes and behaviors (Highland, Herschl, Klanecky, & McChargue, 2013). In addition to these neurobiological factors, evidence, including twin studies and adoption studies, suggests that genetic factors also play a role in substance use disorders (Juhnke & Hagedorn, 2006). Overall, biological correlates of substance use disorders, from elements that predispose or reinforce addictive patterns to the biological ramifications of substance use disorders, demonstrate the relevance of biological factors in both the development and treatment of substance use disorders.

Psychological processes also influence and become influenced by substance use disorders. Anxiety, depression, and stress may predispose individuals toward substance use, and similar predispositions exist for individuals who experience mental health issues

(Brooks & McHenry, 2009; Juhnke & Hagedorn, 2006; Highland et al., 2013).

Alexithymia, or the inability to identify or articulate emotional states, was also found to play a role in the development of substance use disorders (Highland et al., 2013). In addition to creating conditions that may increase the propensity for substance use, pre-existing psychological factors such as depression, anxiety, stress, or other mental health disorders may also be exacerbated by substance use (Brooks & McHenry, 2009; Juhnke & Hagedorn, 2006; Highland et al., 2013). As a result, the recursive nature of substance use and psychological functioning becomes particularly relevant for consideration in substance abuse disorder diagnosis and treatment (Brooks & McHenry, 2009; Juhnke & Hagedorn, 2006; Highland et al., 2013).

Social factors also play a role in the development of and recovery from substance use disorders. Employment status and associated financial repercussions may be negatively impacted by substance abuse, and also may become stressors that trigger the initiation of substance use in some individuals (Henkel, 2011). Family relationships have been found both to impact the initiation of substance use (Loke & Mak, 2013) and to support recovery from problematic substance use patterns (Stanton & Heath, 2005). For some individuals, the salience of engaging in substance use to connect with a peer group may increase the propensity for development of substance use disorders. This is particularly relevant for adolescents, whose initiation of substance use was found by researchers to be directly impacted by peer substance use (Krisjansson, Sigfusdottir, & Allegrante, 2013). Conversely, relationships have been demonstrated to serve as an effective coping mechanism for individuals who are making changes to substance use patterns, and connecting to peers through 12-step or other peer-based support groups has

been found to be effective in supporting abstinence from substance use (Bliss, 2007; Groh, Jason, & Keys, 2008). Social elements have salience in both the assessment and treatment of substance use disorders, and may be particularly relevant factors for supporting changes in problematic substance use patterns.

Spiritual factors, too, have been found to impact both the initiation of substance use and the ability of an individual to maintain changes related to problematic substance use patterns. Spiritual engagement was demonstrated by researchers to be protective against the initiation of substance use (Bliss, 2007). Substance use may be viewed, in part, as a maladaptive effort to fill a spiritual void (Juhnke & Hagedorn, 2006). This perspective is integrated into 12-step support groups, which directly address the spiritual nature of substance use disorders (Brooks & McHenry, 2009; Juhnke & Hagedorn, 2006). The spiritual connection emphasized in 12-step groups was demonstrated to be effective in supporting abstinence from substance use for some individuals (Kaskutas, Bond, & Weisner, 2008). For some individuals, spiritual engagement was found to stem from reaching a point of desperation that was met with a sudden epiphany or insight that held spiritual significance (Miller & C'de Baca, 2001). This moment, which is described as 'hitting bottom' within the context of substance use disorders, was found by some individuals to be a pivotal experience that inspired both profound change and increased attention to the spiritual domain (Miller & C'de Baca, 2001). The epiphanies some individuals experience when 'hitting bottom' coupled with increased openness to spiritual experiences that may invoke a surrender of control over the uncontrollable are implicated in the profound changes that occur for some individuals during the recovery process (Tiebout, 1958). This phenomenon is particularly relevant to 12-step programs, where

surrender exists as the first—and necessary primary step—of the twelve steps that comprise these spiritual programs of peer-supported recovery (Tiebout, 1958; White, 2014). Similarly, the health benefits and support of self-efficacy provided through spiritual practice were found to positively impact individuals making changes to problematic substance use patterns (Piderman, Schneekloth, Pankratz, Stevens, & Altchuler, 2008). The spiritual domain of functioning and its impact on wellness, a growing area of research, has been attended to within the substance use treatment field for some time. As a result, the spiritual domain remains an essential component of conceptualization and treatment of substance use disorders.

Maslow's Hierarchy of Needs

Although current applicability research of Maslow's hierarchy to substance use disorders is limited, Best and colleagues (2008) described specific ways in which Maslow's hierarchy of needs is applicable to substance use disorder treatment. Best and colleagues (2008) described that Maslow's hierarchy can be used to inform care and treatment planning, as Maslow's hierarchy parallels both substance use and sobriety processes. The researchers identified physiological dependence as a priority of treatment, and noted that other issues typically emerge as withdrawal from mood-altering substances dissipates (Best, Day, McCarthy, Darlington, & Pinchbeck, 2008). This parallels the emphasis of Maslow's hierarchy of needs on physiological and safety needs, with other needs emerging as these are satiated (Maslow, 1943; Maslow, 1962). Because Maslow's hierarchy provides a framework for conceptualizing both the progression of substance use disorders and the recovery process, the model can be applied to inform treatment across time, and can be used to match the specific needs of each client while

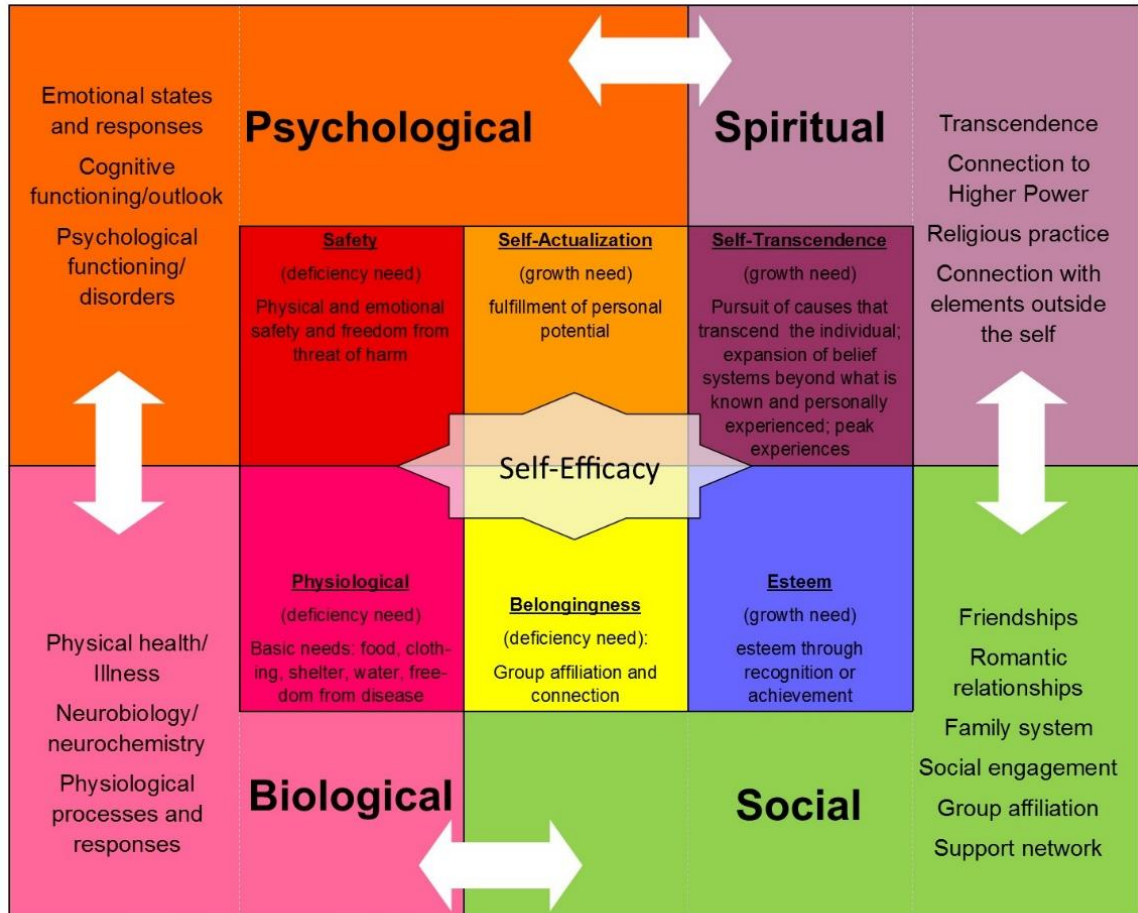
supporting abstinence from substance use (Best et al, 2008). In addition to describing the applicability of Maslow's hierarchy of needs to substance use disorder treatment, Best and colleagues (2008) also implied concordance between the biopsychosocial-spiritual model and Maslow's hierarchy of needs by describing treatment goals through the lens of Maslow's model. Although not articulated in full detail, the unintentionally-drawn parallels between Maslow's hierarchy and the biopsychosocial-spiritual model serve as support for considering the two frameworks as complementary models.

Bandura's Self-Efficacy Theory

Bandura's theory of self-efficacy is operationalized in current evidence-based practices for substance use disorders including motivational interviewing (Miller & Rollnick, 2012) and motivational enhancement therapy (Miller, Zweben, DiClemente, & Rychtarik, 1995). Research focused on the role of self-efficacy in substance use disorder treatment identified self-efficacy's impact on both motivation to change and actions taken toward change (Bandura, 1999; DiClemente, 1986). Self-efficacy—and subsequent movement toward change—has been positively impacted by interventions aimed at increasing self-efficacy through exploration of client motivation to change problematic substance use patterns (Miller & Rollnick, 2012). As a result of self-efficacy's role in several widely-practiced interventions for addressing problematic substance use, its application within a model that contextualizes factors influencing and influenced by substance use is logical and also provides a mechanism for intervening across the model's domains of functioning and drive.

Description of the Williams Hierarchical Integrated Model

The Williams Hierarchical Integrated Model integrates Maslow’s hierarchy of needs (Maslow, 1943; Maslow, 1962) with the biopsychosocial-spiritual model (Adler, 2009; Engel, 1977; Juhnke & Hagedorn, 2006; Hatala, 2013; Scoles, 2009). In addition, the proposed model includes Bandura’s theory of self-efficacy (Bandura, 1977) as a mechanism for conceptualizing the role of motivation in terms of self-efficacy on striving behaviors to meet needs experienced throughout the model. The elements of the Williams Hierarchical Integrated Model are shown in Figure 2.1.



(Adler, 2009; Bandura, 1977; Engel, 1977; Hatala, 2013; Koltko-Rivera, 2006; Maslow, 1943; Maslow, 1962)

Figure 2.1. Williams Hierarchical Integrated Model

The Williams Hierarchical Integrated Model is framed with the biopsychosocial-spiritual model as the outermost layer of functioning. Beneath the umbrella of each domain, elements of Maslow's hierarchy of needs that align with each of the four biopsychosocial-spiritual domains are included to describe each domain in terms of need-based factors and also in terms of deficiency and growth needs and drives. Finally, self-efficacy is included as the core of the model, through which movement toward change, efforts to meet needs, and transitions from maladaptive to adaptive functioning can be operationalized. Self-efficacy necessarily impacts functioning within and across all domains of the model and lies at the center of the model to signify its essential role within this context.

One of the major criticisms of Maslow's model stems from difficulties inherent in its operationalization. As the Williams Hierarchical Integrated Model synthesizes elements of the biopsychosocial-spiritual model and Maslow's Hierarchy of needs into a single model, providing operational definitions for each of Maslow's constructs is possible and necessary to increase the utility of the model and to address this criticism of Maslow's hierarchy. Each element of the Williams Hierarchical Integrated Model is described in greater detail below.

Biological Functioning

The domain of biological functioning in the Williams Hierarchical Integrated Model includes physical health, physical illness, neurobiological and neurochemical processes and functioning, and physiological processes, responses, and functioning. Biological factors including the role of genetics in health and illness, physiological

responses to stress and positive experiences, and basic biological functioning required to sustain life are considered elements of this domain within this model.

Physiological needs. Underlying the general category of biological functioning is the need-based domain of physiological needs. This deficiency-based need includes provision of basic life-sustaining needs including food, water, shelter, and clothing, as well as freedom from disease and access to resources that support physiological functioning. Because biological functioning is generally necessary for functioning in other domains, there is no growth need associated with this broad area of functioning.

Psychological Functioning

The domain of psychological functioning in the Williams Hierarchical Integrated Model includes emotional states, affective responses, and cognitive processes, functioning, and outlook. This domain also includes psychological functioning and the presence or absence of psychological disorders. Because affective responses have both emotional and physiological consequences, this domain is conceptualized as interactive with the biological domain of functioning.

Safety and self-actualization needs. Within the psychological domain are the underlying needs of safety and self-actualization. Safety, a deficiency need, includes both physical and emotional safety and freedom from the threat of physical or psychological harm. Within this context, threats to safety may be acute or chronic, and may exist at an individual, interpersonal, or societal level.

The need for self-actualization, also embedded into the psychological domain of functioning, is a growth need that includes the need for fulfillment of personal potential. Specific examples of expression of this need include engaging in recreational or leisure

activities, pursuing intrinsically-motivated goals, and seeking opportunities that challenge or stretch an individual's current abilities or capacities. Generally, satiation of the need for safety precedes emergence of the need for self-actualization within the psychological domain.

Social Functioning

The domain of social functioning includes friendships, romantic relationships, familial relationships, engagement with social networks, group affiliations, and engagement with networks of support. Social functioning exists interdependently with both the biological and psychological domains, as these social factors may impact both psychological wellbeing and biological functioning.

Belongingness and esteem needs. Underlying the social domain are belongingness and esteem needs. Belongingness is a deficiency need that includes the need for group affiliation and interpersonal connection. This need may be met through engagement with one or more of the identified components of the social domain described above. Esteem needs are growth needs that are focused upon gaining recognition and achievement for accomplishments. Meeting esteem needs necessarily requires individuals from whom to receive recognition or to appraise degree of achievement; as a result this need is generally contingent upon the satiation of the need for belongingness. Specific examples of ways this need may be expressed include goal-directed behavior in work, academic, or recreational pursuits, engagement in activities that require collective contributions to achieve a desired outcome, or risk-taking behaviors that provide opportunities for recognition or achievement as a consequence.

Spiritual Functioning

The spiritual domain of functioning includes the element of transcendence, or movement beyond or outside of the self. This domain may also include connection to a Higher Power, engagement in religious or spiritual practices or activities, or the development of connection with other elements outside of the self, such as nature or global humanity. This domain, like the others, has interrelationships with the other domains of functioning, as spiritual practices may influence social, psychological, and biological domains of functioning in addition to directly impacting spiritual wellbeing.

Self-transcendence needs. The need for self-transcendence stands alone as a growth need that founds the spiritual domain of functioning. Because deficiency needs across the other domains will necessarily draw attention to satiating those needs, self-transcendence may not be expressed by individuals who are struggling to meet basic needs. Nonetheless, self-transcendence—expressed through the pursuit of causes that transcend focus on the self, expansion of belief systems beyond what is known or can be personally experienced, and openness to or reports of peak experiences—remains a relevant component of overall spiritual functioning. Spiritual needs within this context may emerge during times of transition, change, or desperation, when the need for something outside of the self serves as a mechanism for maintaining hope amid challenge. As a result, although self-transcendence is conceptualized as a growth need within the present framework, its salience may emerge during times that appear counterintuitive based upon the other elements of this model.

Self-Efficacy

Within the Williams Hierarchical Integrated Model, self-efficacy is a mechanism through which meeting needs and improving functioning can be supported. Need-based

self-efficacy may be expressed through an individual's current ability to meet a specific need, through the individual's perception of the importance of the need to his or her overall functioning, through the individual's beliefs about his or her ability to meet a given need if effort is exerted, and through the individual's ability to persevere in meeting needs when challenges arise. Self-efficacy within this model serves to contextualize the individual's functioning and need-based drive by drawing awareness to an individual's perceived strengths and limitations in improving functioning or satiating needs identified within the model.

Assets of the Williams Hierarchical Integrated Model

Overall, the Williams Hierarchical Integrated Model aligns clearly with the biopsychosocial-spiritual model, which is the current best-practice model for conceptualizing functioning of individuals with substance use disorders (Juhnke & Hagedorn, 2006; Scoles, 2009). The model also aligns with models used to assess and diagnose problematic substance use, including the DSM-5 (APA, 2013) and the ASAM Treatment Criteria (ASAM, 2013). In addition to alignment with current best-practices in substance use disorder assessment and treatment, the integration of Maslow's hierarchy of needs into the biopsychosocial-spiritual framework provides greater specificity to the four global domains and provides for opportunities to assess the specific needs that are met both through substance use and through more adaptive mechanisms. The dual focus on deficiency and growth needs allows for further contextualization of an individual's functioning; specifically, this information may be useful in assessing whether basic needs may be unmet and to what degree an individual is striving to meet growth needs both

through substance use and through more adaptive mechanisms, such as participation in support groups or engagement in spiritual practices.

Another asset of this model is its direct connection to typical treatment goals of individuals receiving treatment for substance use disorders. These goals, which may include medical stabilization, location of safe housing, increased connections with appropriate peer groups, exploration of motivations for substance use and identification of alternative mechanisms for addressing these needs, engagement in spiritual practices, and development of self-efficacy and motivation to make changes across these domains (ASAM, 2013; Brooks & McHenry, 2009; Glasner-Edwards & Rawson, 2010; Miller et al., 2005; Scoles, 2009; White, 2014), align clearly with the conceptual model described here.

The Williams Hierarchical Integrated Model aligns with each of the discrete elements assessed or measured to determine the multifaceted needs of individuals with substance use disorders. In addition, this model attends to the interactions between and within these elements while also considering the moderating factor of self-efficacy. As a result, this model may be used to determine both individual strengths and needs within and across each of the domains, as well as to explore the individual's beliefs about his or her ability to enact plans for change within and across the model's domains. Further, this model provides the foundation upon which the Williams Hierarchical Integrated Model measurement (WHIMM) was developed. The WHIMM, therefore, is intended to measure the degree to which an individual meets his or her needs within and outside of substance use; this information, coupled with an understanding of the individual's beliefs

about his or her ability to successfully enact new behaviors, may serve as salient information in the process of treatment planning and intervention selection.

Current Measurement Approaches Related to Substance Use

Current paradigms of assessment and measurement of substance use and related factors take many forms. While some assessment instruments focus on frequency and quantity of use, others assess factors including readiness for change and consequences experienced as a result of substance use. Still other assessment instruments measure factors relevant to the recovery process. Taken together, these instruments exemplify the ongoing effort focused on quantifying factors related to problematic substance use.

Measurement of Use

Several instruments have been developed that measure frequency, quantity, and duration of substance use. Two of these instruments, the Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) and the Drug Abuse Screening Test (DAST; Skinner, 1982) are used in a variety of settings to measure frequency, quantity, duration and severity of alcohol and other drug use.

AUDIT. The AUDIT screens for alcohol consumption patterns that may put individuals at risk of increased negative consequences and health risks associated with alcohol use. The instrument contains 10 questions in three domains: hazardous alcohol use, dependence symptoms, and harmful alcohol use (Babor et al, 2001). Within the domain of hazardous alcohol use, questions assess frequency of alcohol use, typical quantity consumed, and frequency of heavy drinking. In the domain of dependence symptoms, questions assess loss of control over alcohol use, increased importance of alcohol use, and morning alcohol use. In the domain of harmful alcohol use, questions

assess guilt following alcohol use, occurrence of blackouts and alcohol-related injuries, and others' concern about the individual's alcohol use (Babor et al, 2001).

DAST. The DAST screens for hazardous drug use by assessing an individual's history of drug use and consequences experienced as a result of drug use. The assessment instrument consists of 28 questions with binary response prompts (yes/no) related to lifetime history of drug use. Questions include items that explore drug use for non-medical purposes, evidence of physiological dependence, frequency of use, efforts to cut back or control use, blackouts or other symptoms of drug use, guilt and family concern about drug use, and social, medical, and legal consequences related to drug use. In addition to these elements, several DAST questions also assess for history of help-seeking related to drug use (Skinner, 1982).

While both of these assessment instruments explore factors relevant to the diagnostic criteria articulated in the DSM-5 related to substance use disorders, they fail to capture contextual elements of problematic substance use, including biological, psychological, social, and spiritual factors that may predispose individuals to problematic substance use and manifest consequences of substance use in varying degrees. Although both the AUDIT and the DAST are valid and reliable assessment tools for screening for problematic substance use (Babor, Higgins-Biddle, Saunders, & Monteiro, 2001; Skinner, 1982), they are not well suited to provide a comprehensive profile of the many factors that impact and are impacted by problematic alcohol or drug use.

Measurement of Stages of Change, Problems, and Consequences Related to Substance Use

In addition to the previously-described assessment instruments that are aligned with diagnostic criteria for substance use disorders, assessment instruments also exist that measure readiness for change. Two assessment instruments, the Stages of Change Readiness and Treatment Eagerness Scale (SOCRATES; Miller & Tonigan, 1996) and the University of Rhode Island Change Assessment Scale (URICA; DiClemente & Hughes, 1990) measure an individual's readiness for change related to problematic substance use patterns and behaviors.

SOCRATES. The SOCRATES forms for both alcohol (A) and drugs (D) measure an individual's readiness to change current alcohol or drug use patterns. The 19 items assess an individual's stage of change related to current substance use patterns and responses provide scores in three subscales: problem recognition, ambivalence, and taking steps. The use of this instrument provides information on an individual's readiness for treatment and his or her willingness to explore potential changes to reduce risk related to problematic substance use patterns (Miller & Tonigan, 1996).

URICA. Similar to the SOCRATES, the URICA also measures readiness for change. The 32 URICA items contribute to one of four subscales: precontemplation, contemplation, action, or maintenance. In addition, an overall readiness for change score is obtained for the overall instrument. This assessment instrument, like the SOCRATES, measures an individual's readiness to engage in treatment and make changes to problematic substance use patterns (DiClemente & Hughes, 1990).

Both the SOCRATES and URICA instruments are valid and reliable instruments for measuring an individual's readiness to change problematic substance use patterns (DiClemente & Hughes, 1990; Miller & Tonigan, 1990). While the assessment of readiness to change may be informative in considering how to best work with an individual engaging in problematic substance use, neither the SOCRATES nor the URICA attends to any factors outside of readiness to change. As a result, environmental, interpersonal, and intrapersonal factors are excluded from exploration within the context of these assessments. In addition, an individual's self-efficacy related to making changes to substance use patterns fails to be adequately captured by these assessment instruments. While these assessments may be quite useful to practitioners working with individuals engaging in problematic substance use, they are insufficient as stand-alone measures to provide a contextual understanding of factors related to the development of problematic substance use patterns and the contextual factors that may make change difficult to initiate or maintain.

Measures of Self-Efficacy Related to Substance Use

Several measures have been developed that assess an individual's self-efficacy related to refraining from problematic substance use in a variety of contexts. The Brief Situational Confidence Questionnaire (BSCQ; Breslin, Sobell, Sobell & Agrawal, 2000) and the Drug Taking Confidence Questionnaire (DTCQ-8; Sklar & Turner, 1999) are short-form assessment instruments that assess an individual's self-efficacy related to abstaining from substance use under a variety of circumstances.

BSCQ. The BSCQ measures an individual's confidence to abstain from heavy alcohol consumption or other drug use in eight separate domains on a scale ranging from

‘not at all confident’ at 0% to ‘totally confident’ at 100%. The eight domains, each measured through one question on the assessment, include physical discomfort, cravings, positive emotional states, and negative emotional states. Interpersonal conflict, social pressure to use, and positive social experiences are also specific domains identified by the instrument. Testing control over use is presented as the eighth domain of this instrument. Taken together, these eight questions across the eight domains provide information on overall self-efficacy in abstaining from heavy alcohol or drug use as well as specific information related to which domains are met with increased or decreased levels of self-efficacy to refrain from problematic substance use (Breslin, Sobell, Sobell & Agrawal, 2000).

DTCQ-8. The DCTQ-8, which has both alcohol (A) and drug (D) forms, uses a scale similar to that of the BSCQ. This scale ranges from ‘not at all confident’ to ‘very confident’ on a scale from 0-100. The DCTQ-8 measures global self-efficacy related to abstaining from heavy drinking or use of the individual’s drug of choice. Although the DTCQ-8, like the BSCQ, is comprised of eight questions, only a global self-efficacy score is obtained with the use of this instrument (Sklar & Turner, 1999).

Both the BSCQ and DTCQ-8 are valid and reliable measures of substance-related self-efficacy (Breslin, Sobell, Sobell & Agrawal, 2000; Sklar & Turner, 1999). Self-efficacy, as previously stated, may impact both an individual’s ongoing use of substances and his or her efforts to make changes to problematic substance use patterns. While both of these assessment instruments include self-efficacy statements related to substance use associated with contextual factors including physical, emotional, and social elements, neither assessment instrument focuses on self-efficacy related making changes to current

substance use patterns. Instead, the two instruments assess an individual's self-efficacy related to abstaining from problematic use in given situations. The nuanced differences between these two elements are relevant, particularly for individuals who have a desire to make changes but who have been unable to successfully do so. Finally, these instruments, through their focus specifically on use-related self-efficacy, fail to capture elements of self-efficacy related to acquiring peer and familial support, managing physical or emotional discomfort, or meeting other needs outside of the domain of problematic substance use. As a result, the clinical utility of these tools is limited specifically to the individual's perceived self-efficacy to sustain previously-made changes to problematic substance use patterns.

Multidimensional Substance Use Assessment Instruments

Substance use disorders are multidimensional in nature, as related precipitating and consequential factors exist in biological, psychological, social, and spiritual domains. The ASAM criteria emphasize a focus on multidimensional factors related to problematic substance use. As a result, several assessment instruments have been developed to assess a range of factors associated with problematic substance use. These assessment tools include the Addiction Severity Index (ASI-6; Denis, Cacciola, & Alterman, 2013) and the Addiction Dimensions for Assessment and Personalized Treatment (ADAPT; Marsden et al., 2014).

ASI-6. The ASI-6 is the most current version of the Addiction Severity Index, a semi-structured interview protocol that assesses substance-related problems, history of use, and severity of problems associated with substance use to form a multidimensional profile of an individual's substance use patterns and level of functioning within multiple

domains. Domain areas assessed include medical, psychiatric and legal status, family and social supports, employment and finances, and alcohol and drug use status. An individual's past and current substance use patterns are also assessed through the use of the ASI-6. Additionally, the ASI-6 assesses the individual's perception of the severity of his or her alcohol or other drug problem, including the frequency and duration of problems associated with alcohol or other drug use. Overall, this semi-structured interview explores contextual information related to the biological, psychological, and social domains and collects information related to the individual's past and current substance use patterns and his or her concerns surrounding these patterns of use and associated consequences (Denis, Cacciola, & Alterman, 2013).

ADAPT. The ADAPT is a 16-item assessment instrument that measures severity and complexity of substance use and associated consequences. The instrument uses a four-point Likert scale for each of the 16 items, ranging from 'none' through 'severe/high'. The instrument focuses on relevant factors including tolerance, craving, history of overdose, physical, psychological, personality and emotional factors, relationships, risk of harm, housing, finances, history of crime, motivation to change, outlook, support systems, employment and education, and environment. The ADAPT is a reliable and valid instrument that allows for the development of risk profiles and implications for treatment stemming from the assessment results (Marsden et al., 2014).

Both the ASI-6 and the ADAPT attend to multidimensional factors associated with problematic substance use. While the ASI-6 requires the use of a semi-structured interview protocol, the ADAPT uses a questionnaire format that may be more functional for some practitioners. Although both of these instruments collect contextual information

related to problematic substance use patterns, neither assessment tool attends overtly to the spiritual domain of functioning. In addition, the questions of both instruments are intended to measure actualized resources and concerns, with no attention paid to self-efficacy related to meeting identified needs in the case of the ASI-6 or changing highly-concerning patterns in the case of the ADAPT. While both of these assessment instruments provide a global picture of an individual's current concerns across the biological, psychological, and social domains and a specific view of concerns within the realm of substance use, the function of the instruments as tools for capturing the overall contextual picture leaves behind several pieces of relevant information that may be useful in planning treatment and assessing progress and response to interventions.

Conclusion

Many assessment instruments exist to measure discrete elements associated with problematic substance use patterns. In addition, several assessment measures explore contextual factors and multi-dimensional elements that may influence and be influenced by problematic substance use patterns. The reliance of many of these instruments on either the DSM-5 or the ASAM criteria as foundational to the information collected impacts the scope of the information explored through the use of these instruments.

The Williams Hierarchical Integrated Model provides an alternate paradigm for conceptualizing overall functioning, drive to meet needs, and self-efficacy to meet those needs, which helps to address the gaps in current conceptual approaches and assessment tools associated with these models. Through integrating Maslow's hierarchy of needs into the biopsychosocial-spiritual framework and embedding self-efficacy into the model's core, a multi-dimensional framework that attends to strengths, needs, and beliefs

about the individual's ability to meet these needs emerges as a way to unify the thematic elements expressed within the DSM-5 criteria, ASAM criteria, and assessment paradigms that are currently in place.

The Williams Hierarchical Integrated Model forms a foundation upon which the WHIMM was developed to measure biological, psychological, social, and spiritual domains of functioning while also considering and attending to both deficiency and growth needs in each of these areas. Additionally, the WHIMM's integration of self-efficacy within each of these domains ensures that attention to the individual's perceptions about his or her ability to meet needs—both within and outside of substance use behaviors—is attended to within the assessment instrument. As a result, the WHIMM, built around the Williams Hierarchical Integrated Model, cohesively unifies data collection within and across the model's domains.

CHAPTER THREE

METHODS

This chapter describes the processes involved in developing the WHIMM. Specific details are provided related to item and instrument construction, pilot one, pilot one re-contact, and final administration. Descriptions of the methods of data analysis are also provided.

Participants

The WHIMM was developed for use with the population of individuals age 18 and older who have thought about cutting back on alcohol or other drug use at some point in their lives. As a result, two screening questions related to these two criteria were used to access only participants who were members of this population. A total of 620 unique participants completed either pilot one or the final administration of the WHIMM. A national sample was recruited through Qualtrics Panels as described previously. Specific demographic data related to the overall aggregate sample are provided in the text and tables below.

Completion of the WHIMM based upon gender was approximately equal between males and females. Transgender respondents comprised .3% of the sample. Approximately 8% of respondents reported their ethnicity as Hispanic/Latino. The remainder of respondents reported their ethnicity as non-Hispanic. The majority of respondents were White (84%). Approximately 7% of respondents were Black or African American. Roughly 3% of respondents were Asian, and an additional 2% of

respondents were multiracial. Fewer than 2% of respondents were American Indian/Alaska Native, and only one individual was a Native Hawaiian/Pacific Islander. In addition, eight respondents reported their race as ‘other’. Detailed data describing these demographics are presented in table 3.1.

Table 3.1

Participant Demographics: Gender, Ethnicity and Race

Gender	Ethnicity	Race	(N=620)	
Female (n=322)	Hispanic/ Latino (n=29)	Black or African American	1	
		White	25	
		Multi-Racial	2	
		Other	1	
	Non-Hispanic (n=293)	American Indian or Alaska Native	7	
		Asian	12	
		Black or African American	17	
		Native Hawaiian or Pacific Islander	1	
		White	248	
		Multiracial	4	
		Other	4	
		Hispanic/ Latino (n=23)	Black or African American	2
			White	18
			Multiracial	3
	American Indian or Alaska Native	4		

Table 3.1

Participant Demographics: Gender, Ethnicity and Race

Gender	Ethnicity	Race	(N=620)
Male (n=296)	Non-Hispanic (n=273)	Asian	8
		Black or African American	23
		White	231
		Multiracial	4
		Other	3
Transgender (n=2)	Non-Hispanic (n=2)	Asian	1
		White	1

Participant age approximated a normal distribution, with the fewest participants observed between the ages of 18 and 20 and between the ages of 81 and 90. Over half of participants were between the ages of 18 and 50. Table 3.2 presents the age ranges of participants.

Table 3.2

Age Distribution of WHIMM Participants

	Frequency	Percent
18-20	10	1.6
21-30	96	15.5
31-40	107	17.3
41-50	123	19.8
51-60	162	26.1
61-70	102	16.5
71-80	18	2.9
81-90	2	.3
Total	620	100.0

The geographic distribution of participants is roughly equal for the northeast and the west, with 21% of respondents reporting they reside in each of these regions. An additional 25% of respondents reported they reside in the west, while 32% of respondents reported they reside in the south. Two participants reported that they do not live in the United States. Detailed data for participant geographic region are presented in table 3.3.

Table 3.3

Geographic Region of WHIMM Participants

	Frequency	Percent
Northeast	134	21.6
South	199	32.1
Midwest	133	21.5
West	152	24.5
I do not live in the United States	2	.3
Total	620	100.0

Educational level of participants roughly approximates a normal distribution, with fewer individuals with some high school (2.7%) and doctoral degrees (1.8%) than other educational levels. A majority of respondents possessed some level of post-secondary education, with a total of 37% of respondents indicating they obtained either a bachelor's or master's degree. Detailed educational attainment data are presented in table 3.4.

Table 3.4

Education Level of WHIMM Participants

	Frequency	Percent
Some high school	17	2.7
High school diploma or GED	133	21.5
Some college	153	24.7
Associate's degree	83	13.4
Bachelor's degree	162	26.1
Master's degree	61	9.8
Doctoral degree	11	1.8
Total	620	100.0

Approximately 16% of respondents previously sought treatment for substance use concerns. This represents a minority of respondents, as almost 82% of respondents never sought treatment. An additional 2% of respondents preferred not to disclose a response to this question. Detailed data are provided in table 3.5.

Table 3.5

Substance Use Treatment History of WHIMM

Participants

	Frequency	Percent
Yes	100	16.1
No	505	81.5
Prefer not to Answer	15	2.4
Total	620	100.0

Overall, the sample is representative in terms of gender, age, ethnicity, race, geographic region, educational attainment, and treatment history.

Procedures for Construction of the WHIMM

The Williams Hierarchical Integrated Model Measurement (WHIMM) was constructed based upon a test blueprint developed by the researcher. The test blueprint (see Appendix A) outlines and describes each element of the instrument. The test blueprint ensured that factors including instrument length, content, subscales, response types, directions, administration, and scoring were considered and planned for prior to instrument construction (Bracken, 2012). The researcher used an initial pilot, re-contact pilot, and final administration to obtain information on the WHIMM’s reliability (i.e., internal consistency and test-retest), construct validity, including the WHIMM factor structure and concurrent validation with other instruments.

Instrument Development. The WHIMM test blueprint guided scale and item development and item reduction. The WHIMM was developed as a self-report instrument

initially administered through Qualtrics, a secure online survey platform. Based upon data obtained in pilot one, revisions to the instrument design were made to maximize reliability, eliminate items that were less effective than those retained items, and reduce the total number of instrument items to maximize scale and overall instrument reliability, as well as reduce overall item count. A re-contact of 50 of the 200 original participants of pilot one provided data to assess test-retest reliability and construct validity of the WHIMM when compared with the Alcohol Use Disorders Identification Test (AUDIT; Babor et al., 2001) and Drug Abuse Screening Test (DAST; Skinner, 1982).

The AUDIT is used to screen for alcohol consumption patterns that may put individuals at risk of increased negative consequences and health risks associated with alcohol use. The instrument contains 10 questions in three domains: hazardous alcohol use, dependence symptoms, and harmful alcohol use. The AUDIT demonstrated internal-consistency reliability of .86 and demonstrated sensitivity of approximately .95 for identifying individuals with problematic drinking patterns. The AUDIT demonstrated specificity of approximately .80 for accurately distinguishing between problematic and non-problematic drinkers (Babor et al., 2001). The AUDIT has been correlated with other instruments measuring problematic alcohol use, consequences of alcohol use, attitudes toward alcohol use, reasons for alcohol use, and negative affective states after drinking.

The AUDIT was selected for use in the present study as a result of its psychometric adequacy and evidence of correlation with other variables related to problematic alcohol use. Given the WHIMM's inclusion of subscales that measure needs met within and outside of substance use in multifaceted ways, the AUDIT was selected as

a comparison instrument to explore convergent and discriminant validity of the constructs within the WHIMM in comparison to the AUDIT. Specifically, the WHIMM Physiological Deficiencies and Physiological Attainments subscales for both forms were evaluated in terms of convergent validity with the AUDIT, as excessive and problematic use of alcohol is measured by the AUDIT and may relate to physiological functioning as operationally defined within the WHIMM. In contrast, the AUDIT's lack of inclusion of concerns that relate to the Safety, Belongingness, Esteem, Self-Actualization, Self-Transcendence Deficiencies, Self-Transcendence Attainments, or any of the four Self-Efficacy subscales on each WHIMM form simultaneously allowed for exploration of discriminant validity between the AUDIT and these subscales for both the WHIMM Global and WHIMM Substance Use forms.

The DAST is used to screen for hazardous drug use by assessing an individual's history of drug use and consequences experienced as a result of drug use. The assessment instrument consists of 28 questions with binary response prompts (yes/no) related to lifetime history of drug use. Questions include items that explore drug use for non-medical purposes, evidence of physiological dependence, frequency of use, efforts to cut back or control use, blackouts or other symptoms of drug use, guilt and family concern about drug use, and social, medical, and legal consequences related to drug use. In addition to these elements, several DAST questions also assess for history of help-seeking related to drug use. The DAST demonstrated internal consistency reliability of .92. (Skinner, 1982).

The DAST was selected as a comparison instrument for the present study due to its adequate reliability and focus on drug-related use and consequences. Because some

individuals may engage in problematic drug use without also engaging in problematic alcohol use, the inclusion of the DAST reflects awareness of this possibility for the purposes of exploring construct validity. Given the WHIMM's inclusion of items related to physiological needs met through and outside of substance use while also including needs of safety, belongingness, esteem, self-actualization, and self-transcendence, the DAST was included to assess convergent and discriminant analysis as described above for the AUDIT. Specifically, Physiological Deficiencies and Physiological Attainments were analyzed within the context of convergent validity and the remainder of the WHIMM subscales on both forms were compared with the DAST in terms of discriminant validity.

The use of Exploratory Factor Analysis (EFA) procedures to determine the factor structure of the WHIMM Global and WHIMM Substance Use forms allowed for analysis of construct validity as it relates to the overall concordance between the Williams Hierarchical Integrated Model and the WHIMM. Because the WHIMM was developed for use with a specific sub-population of the overall population—namely people who have thought about cutting back on alcohol or other drug use—confirmatory factor analysis was not conducted due to the WHIMM's use of two forms that are hypothesized to obtain statistically significantly different responses from participants who meet participation criteria. EFA allowed for exploration of the underlying factor structure in both forms separately while also considering the differential response patterns possible on each form of the WHIMM. Results of the EFA also allowed for analysis of the construct validity of the WHIMM's subscales for both the Global and Substance Use forms related to the overall Williams Hierarchical Integrated Model.

The final WHIMM was administered to an additional 420 individuals. These data were combined with the original pilot data for retained items and used to conduct exploratory factor analysis of the final scale. Detailed information on these procedures is described in the following sections.

Although the use of self-report instruments allows for the possibility of deception or socially-desirable response patterns, the use of anonymous computer-based administration coupled with data collection that is not associated directly with a treatment service provider is likely to increase the veracity of results (Del Boca & Noll, 2000). Other factors that may adversely influence results of the instrument development process include instrument completion by individuals who are under the influence of mood-altering substances at the time of participation, cognitive impairment of individuals completing the instrument, and difficulty maintaining attention to task or motivation to complete the instrument (Del Boca & Noll, 2000). As a result of these potential threats to the validity of the instrument, the researcher obtained a national sample of 620 participants to minimize the influence of any one individual's responses within the whole of the data set.

Preliminary item development. Initial item construction was informed by the constructs that comprise the Williams Hierarchical Integrated Model as described in Chapter Two. Item development for each subscale involved creating an item bank of 25 items for each of the following subscales: Physiological Deficiencies, Physiological Attainments, Safety, Belongingness, Esteem, Self-Actualization, Self-Transcendence Deficiencies, and Self-Transcendence Attainments. These eight subscales were constructed to include a deficiency and a growth element within the biological

(Physiological Deficiencies and Physiological Attainments), psychological (Safety and Self-Actualization), social (Belongingness and Esteem) and spiritual (Self-Transcendence Deficiencies and Self-Transcendence Attainments) domains of functioning identified in the Williams Hierarchical Integrated Model. The researcher also created a bank of 12 items for each of the following subscales: Physiological Deficiencies Self-Efficacy, Physiological Attainments Self-Efficacy, Safety Self-Efficacy, Belongingness Self-Efficacy, Esteem Self-Efficacy, Self-Actualization Self-Efficacy, Self-Transcendence Deficiencies Self-Efficacy, and Self-Transcendence Attainments Self-Efficacy.

Because the WHIMM is structured to measure needs and self-efficacy both when using substances and when not using substances, each item appeared twice, once with and once without the phrase, ‘when I use alcohol or drugs.’ Each item written was developed to sample one element of the overall construct for each subscale; combined, the items were developed to sample as many unique components of each construct as possible. The final pilot one instrument contained a total of 296 items for each form (Global and Substance Use), with 200 items comprising the needs section and 96 items comprising the self-efficacy section of the Global and Substance Use forms individually. All items used a six-point Likert scale that included the following response options: *STRONGLY DISAGREE*, *DISAGREE*, *SLIGHTLY DISAGREE*, *SLIGHTLY AGREE*, *AGREE*, and *STRONGLY AGREE*. Likert scales are used with regularity to measure attitudes, beliefs, and opinions (Cohen, Swerdlik, & Sturman, 2012). As a result, the use of the Likert scale for the WHIMM aligned most clearly with the goal and purpose of the instrument. A six-point Likert scale, rather than a five-point scale with a neutral midpoint, was selected to force choice between agreement and disagreement. Given the

potential for responder bias toward neutral for items that are sensitive in nature (Garland, 1991), the omission of a neutral point also was selected for the WHIMM to increase reliability and validity of the instrument.

The pilot one instrument contained a total of 688 items, one informed consent acknowledgement item, one item to screen out ineligible respondents (I have thought about cutting down on my alcohol and/or drug use at some point in my life) and five demographic items (Appendix B), presented at the end of the instrument.

Panel review of items. Following item construction, the complete first pilot was sent to an expert panel consisting of one specialist in test construction, two specialists in the field of substance use disorder counseling, and one individual who had a clear understanding of the Williams Hierarchical Integrated Model used to design the WHIMM. Feedback from these experts was used to revise items, reduce potential for error, and enhance reliability by reducing item ambiguity. The items presented in Appendix C represent the final collection that appeared on the WHIMM pilot one instrument.

Pilot one. Instrument administration occurred within the Qualtrics online survey platform. The first pilot was administered through Qualtrics Panels, a pay-per-participant service offered by Qualtrics for the purpose of conducting survey research. This platform provided access to a national sample of 200 individuals for pilot one. Individuals who did not meet the criteria for inclusion were screened out prior to completing the survey. Qualtrics Panels also inserted validity measures including inattentive response validation items and median time to completion validation to increase the number of valid response sets provided. Responses that failed the validity measures or were completed too quickly

were eliminated immediately by Qualtrics Panels and not counted toward the 200 participant total. As a result, the data from all 200 participants were included in the preliminary analyses conducted following pilot one administration of the WHIMM.

Following collection of pilot one data, the researcher conducted reliability analyses of each subscale using SPSS for Windows 22.0. Internal consistency reliabilities for each subscale were obtained. Using the ‘reliability if item deleted’ statistic obtained through multiple iterations of the internal consistency analysis, the researcher removed items one-by-one for each subscale until the fewest items needed to maintain a Cronbach’s alpha inter-item reliability coefficient of .90 or greater were identified. Although the initial blueprint identified a final count of 10 items per subscale for each of the needs subscales, reducing item counts to 10 for the physiological deficiency and attainment subscales reduced reliabilities of these subscales below .90. Given the researcher’s goal of keeping subscale reliabilities at .90 or greater, a final item count of 15 items per subscale was used to keep all subscale reliabilities equal to or greater than .90. Although reliabilities of .80 and greater are generally considered adequate for assessments that will be used for research and testing not used to determine educational placements or psychological diagnoses (Wasserman & Bracken, 2013), the researcher chose to maintain reliabilities greater than .90 due to the instrument’s potential for use in clinical settings.

A similar procedure was used for the self-efficacy subscales, although these items were grouped into four, rather than eight, subscales: Biological, Psychological, Social, and Spiritual. Given the difficulty of measuring deficiency self-efficacy as separate from attainment self-efficacy in the physiological and self-transcendence need domains, all

self-efficacy items for the physiological and self-transcendence subscales were worded similarly to measure the individual's perceived potential to meet physiological and self-transcendence needs. Items were reduced to maintain a balance of five items from each of the following subscales: safety self-efficacy, self-transcendence self-efficacy, belongingness self-efficacy, and esteem self-efficacy. Given the similarities among deficiency and attainment physiological self-efficacy needs and deficiency and attainment self-transcendence self-efficacy needs, a total of 10 items were retained from each of the combined subscales of physiological and self-transcendence self-efficacy needs. The final subscales for biological, psychological, social and spiritual self-efficacy included 10 items per subscale, with items retained that produced the greatest reliability and also included equal numbers of deficiency and growth items for the psychological and social self-efficacy subscales.

This process was repeated separately for the Substance Use form of the WHIMM. After identifying the items that produced the greatest reliability for each Substance Use form subscale in an identical procedure to that described above, each form's subscale reliability was re-computed with the other form's retained items to identify and retain the paired analogous items across both forms that yielded the greatest reliability coefficient. The final version of the WHIMM contains paired items on the Global and Substance Use forms that yield paired subscales with similar reliabilities across forms.

The final WHIMM instrument includes a total of 15 items per subscale for the following subscales: physiological deficiencies, physiological attainments, safety, belongingness, esteem, self-actualization, self-transcendence deficiencies, and self-transcendence attainments. A total of 10 items per subscale are included for the

following subscales: biological self-efficacy, psychological self-efficacy, social self-efficacy, and spiritual self-efficacy. Item stems for the Global and Substance Use forms are identical, with the addition of the statement, “when I use alcohol or drugs” at the end of the Substance Use form items. The final WHIMM has a total of 320 items, with 160 items in each form of the instrument. The item distribution within the Williams Hierarchical Integrated Model framework is pictured in figure 3.1.

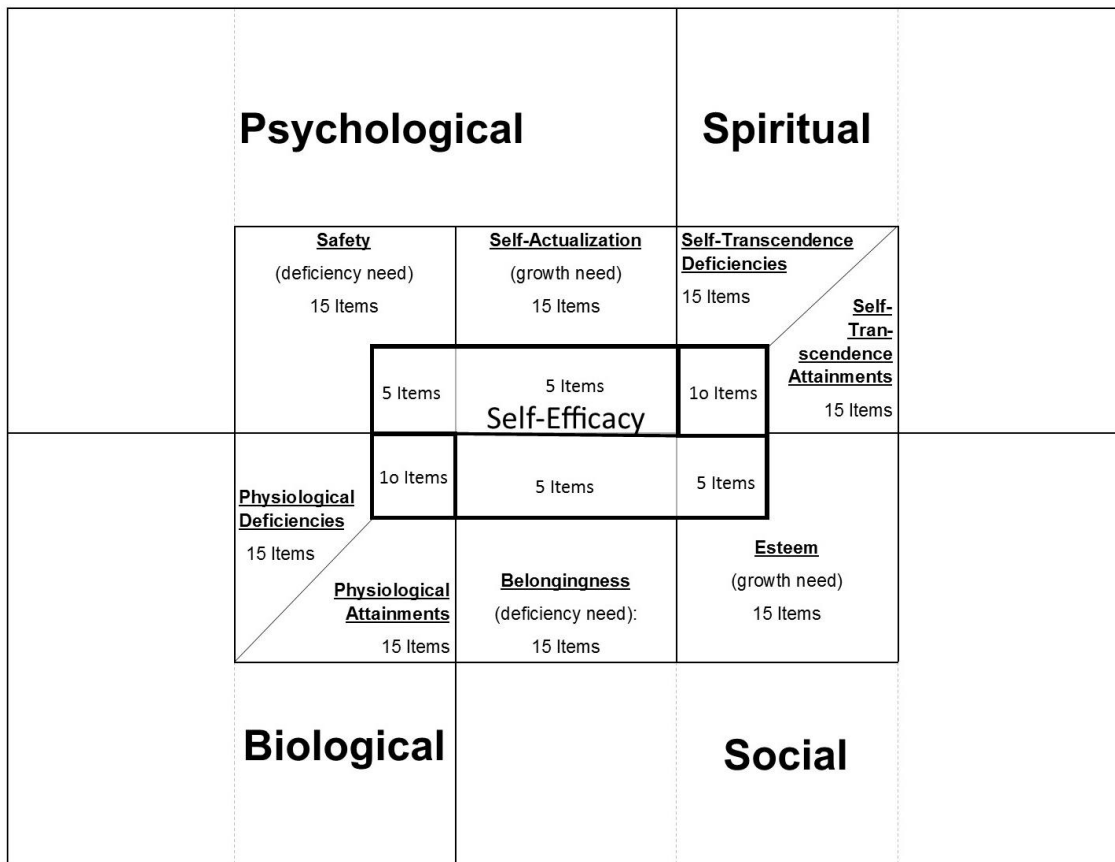


Figure 3.1: WHIMM Item Distributions for Each WHIMM Form

Pilot one re-contact. The pilot one re-contact was also administered through Qualtrics Panels. Qualtrics Panels re-contacted participants from pilot one with the pilot one re-contact instrument three weeks after pilot one WHIMM data were provided to the researcher. The pilot one re-contact of the WHIMM included the final items selected for

instrument inclusion following the reliability analyses and item reduction process. This pilot also included two additional instruments, the AUDIT and the DAST, following the administration of the WHIMM items. These instruments were included to support construct validity analysis between the WHIMM, exploring convergent validity coefficients. Items presented in the pilot one re-contact of the WHIMM are provided in Appendix D. Qualtrics Panels again inserted validity measures including inattentive response validation items and median time to completion validation to increase the number of valid response sets provided and to eliminate invalid and hurried participant response data. A total of 50 complete responses from re-contact participants were obtained, with identifiers provided by Qualtrics to match data from the first pilot with the re-contact data to analyze test-retest reliability of the WHIMM.

All items were presented to all re-contact participants in the same order, with the WHIMM Global form first, the WHIMM Substance Use form second, the AUDIT third, and the DAST fourth. This order, which retained the presentation order of the WHIMM Global and WHIMM Substance Use forms from the first administration, was used to reduce the participants' consideration of how to respond to items on the WHIMM based upon how they responded on the two measures that directly address substance use (the AUDIT and the DAST).

The researcher analyzed convergent and discriminant construct validity by using SPSS to calculate concurrent Pearson's correlation coefficients (r) between each of the WHIMM subscales for both the Global and Substance Use forms and the AUDIT, and between the WHIMM subscales for these two forms and the DAST. The researcher computed test-retest reliability for the WHIMM by calculating correlation coefficients

between corresponding subscales on participant responses to the pilot one items retained for final administration and the pilot one re-contact items of the WHIMM. Following this analysis, the researcher followed up with paired-sample *t*- tests to test for statistically significant differences between paired subscales for the first pilot and re-contact WHIMM data. These two statistical tests were used together to determine the strength of the correlation between first and re-contact responses, with high correlations suggesting greater test-retest reliability, and to look for changes in scores that were statistically significant—a potential indicator of poor test-retest reliability. Results of these statistical tests are presented in chapter four.

Final administration. Qualtrics Panels conducted the final administration of the WHIMM, again including inattentive response pattern items within the instrument items to increase the validity of responses. A total of 420 individuals completed the final WHIMM. Qualtrics Panels ensured that duplicate responses were not obtained between pilot one and the final pilot. As a result, a total of 620 participants were included in the final WHIMM analyses. The retained item responses for the 200 participants from pilot one were combined with the final administration responses of the 420 final pilot participants. These data were analyzed as a unified data set to obtain final subscale Cronbach's alpha internal consistency coefficients for each subscale for each form as well as overall Global and Substance Use reliability coefficients for each WHIMM form. Following these analyses, the researcher computed subscale correlation coefficients to determine the degree to which subscales correlate with one another. Final WHIMM overall and subscale reliabilities and inter-subscale correlations are presented in chapter four.

Due to the potential for some degree of correlation between the elements of the WHIMM, the data analysis model used by Scott (2011) was initially considered as a method for exploratory factor analysis (EFA) for the present study. EFA necessitates exploration of both orthogonal and oblique rotations to determine a parsimonious yet meaningful factor structure (Pett, Lackey, & Sullivan, 2003). As a result, multiple EFA procedures were conducted with both orthogonal and oblique rotations to ensure that factors observed were both practically useful and statistically supported.

The 420 participants' responses from the final pilot of the WHIMM coupled with retained items from the first pilot of 200 participants were used to analyze the underlying factor structure of the WHIMM. The researcher used a principal components analysis (PCA) with Varimax rotation to reduce the data set into a smaller number of factors, to estimate the variance explained by each factor, and to reveal the latent structure of the WHIMM. The PCA with Varimax rotation yielded data that produced clear and meaningful factor structures for each form and for both needs and self-efficacy variables. PCA with Varimax rotation was therefore used consistently for all EFA procedures.

EFA procedures were conducted separately on the Global and Substance Use forms of the WHIMM as a result of the underlying assumption that the two forms did not measure identical constructs despite the paired item format. Paired sample *t*-tests between corresponding Global and Substance Use subscales were used to justify this decision. These results are presented in chapter four.

Within each form of the WHIMM, EFA of the need items was conducted separately from the EFA of items focusing on self-efficacy. This decision was made by the researcher as a result of the Williams Hierarchical Model's separation of needs and

self-efficacy as distinct constructs. The self-efficacy items also produced more distinct factors when EFA was used with these items exclusively. Given the nature of EFA to reduce variables to the most parsimonious factor structure that explains the greatest amount of variance with the fewest number of factors, (Pett, Lackey, & Sullivan, 2003), the dissolution of self-efficacy factors when all items were combined for the process of EFA is logical; nonetheless, the distinct item format and purpose of the self-efficacy items (i.e., to determine the degree to which a respondent is willing and able to perform or achieve a given element, rather than to assess his or her current status of attainment or need of an element) supports the researcher's decision to use EFA procedures on need items and self-efficacy items separately.

Because the hypothesized factor structure was informed by the Williams Hierarchical Integrated Model and guided by the instrument development blueprint, the researcher set the number of factors to be extracted for the need items at eight and the number of factors to be extracted for the self-efficacy items at four as a result of the hypothesized factor structure. Final EFA results for both the Global and Substance Use forms of the WHIMM are presented in detail in chapter 4.

Procedures for Data Collection

The researcher obtained Institutional Review Board (IRB) approval from the College of William and Mary prior to initiating data collection. Participants were provided with an online informed consent document (Appendix E) prior to accessing the WHIMM, and participants who did not agree to participation were not able to access the WHIMM items. The informed consent document contained specific information on participant rights, risks, and benefits. This document also described the purpose of the

study and provided contact information for the IRB, the researcher, and the researcher's dissertation chair in the event that the participant experienced concerns.

Throughout the three administrations of the WHIMM, directions were presented that clearly described how to complete the instrument (Appendix F). The purpose of the WHIMM and the additional instruments presented (AUDIT and DAST) in the pilot one re-contact were also described clearly and openly (Appendix G). During item construction the researcher attended to the readability and clarity of items; multiple revisions of items were made prior to the first pilot for this purpose. The Flesch-Kincaid reading level for the WHIMM Global items was grade 5.0. The addition of 'when using alcohol or drugs' to each item of the Substance Use form may inflate the Flesch-Kincaid reading level of 6.6 for the WHIMM-Substance use form artificially due to a higher word count without commensurate increased reading difficulty.

Participants were recruited by Qualtrics and data were collected and stored in a secure, password-protected Qualtrics account maintained online through the researcher's affiliation with the College of William and Mary. The following description of participant recruitment was obtained from the Qualtrics ESOMAR 28 document (Qualtrics, 2014). Qualtrics provided a total of 620 unique data sets and verified unique participants by IP address and digital fingerprinting. The specific sample obtained was considered a niche sample, therefore Qualtrics used a specialized recruitment campaign to access participants. They accessed individuals via third-party panels that were likely to contain individuals who met the selection criteria for this study. Respondents were randomly selected from the total panel population to receive the invitation to participate in this study. Participants were provided with the purpose of the study, the anticipated

length of the survey, and incentives available based upon survey completion within the survey recruitment email. To reduce the possibility of self-selection bias, participants were not informed of the specific contents of the survey until they initiated participation. Qualtrics selected and provided participant incentives independently for completing the survey. No personally identifying information was collected by the researcher at any point in the study, and Qualtrics assigned individuals unique identifiers not connected with their personal identities in any way to assist in pairing scores and ensuring unique responses.

The administration of WHIMM pilot one yielded a median time to completion of approximately 33 minutes. These data were collected between July 23 and July 28, 2015. The WHIMM pilot one re-contact data collection took place between August 18 and August 19, 2015. Only individuals who completed the pilot one WHIMM were contacted to participate in the pilot one re-contact. The final administration yielded a median time to completion of 22 minutes. This administration of the WHIMM took place between September 1 and September 8, 2015. Individuals who participated in the WHIMM pilot one data collection were excluded from participation in the final administration.

Data were transferred from Qualtrics to SPSS for data scrubbing and statistical analyses. Statistical procedures were conducted to determine inter-item reliability, test-retest reliability, construct validity, and underlying factor structure as described previously in this chapter.

The following hypotheses guided the analysis and interpretation of statistics obtained throughout the WHIMM development process. These hypotheses and the corresponding results are discussed in greater detail in chapter four.

Hypotheses

1. The value of Cronbach's coefficient alpha for each WHIMM subscale will be greater than .80.
2. Factor analysis of data obtained following final instrument administration will yield distinct factors that support the Williams Hierarchical Integrated Model's discrete elements and overall framework.
3. There are differences between an individual's responses to analogous subscales when one subscale references substance use and the other references global experience for individuals who have ever considered cutting down on alcohol or other drug use.

Summary

The WHIMM instrument development process was guided by a test construction blueprint (Appendix A). The WHIMM was piloted first on a sample of 200 individuals. Results of this pilot informed revisions to increase reliability and decrease item count of the final instrument. The final instrument was administered to 420 individuals. All participants were obtained through Qualtrics Panels. Sample demographic information indicates the sample is generally representative of the population identified for use of the WHIMM.

Cronbach's alpha reliability coefficients, test-retest reliability, and construct validity statistics were obtained following pilot one and the pilot one re-contact to refine

and further validate the WHIMM. EFA was used following the final instrument administration with all unique data obtained to provide more detailed analysis of the instrument's items and factors. Additional analyses related to scoring and significance testing were also conducted. Results of each of these statistical procedures are explained in chapter four.

CHAPTER FOUR

RESULTS

This chapter presents the results of the data analyses conducted throughout the pilot one, pilot one re-contact, and final administration of the WHIMM. The hypotheses being tested include the following:

1. The value of Cronbach's coefficient alpha for each WHIMM subscale will be greater than .80.
2. Factor analysis of data obtained following final instrument administration will yield distinct factors that support the Williams Hierarchical Integrated Model's discrete elements and overall framework.
3. There are differences between an individual's responses to analogous subscales when one subscale references substance use and the other references overall experience for individuals who have ever considered cutting down on alcohol or other drug use.

Data Analysis

The following sections describe the data analysis procedures and results for the final WHIMM instrument. Unless otherwise indicated, a total sample of 620 participants, obtained by combining the retained items for each of the 200 participants from pilot one with the 420 responses collected in the final WHIMM administration, was used for these analyses.

Descriptive Statistics and Reliabilities for Global and Substance Use Subscales

The mean WHIMM Global form score of 3.72 was greater than the mean WHIMM Substance Use form of 3.20. The two WHIMM forms did not demonstrate skewed results, although both forms demonstrated leptokurtic distributions overall. The WHIMM Global Needs subscales together yielded a mean score of 3.34. These scores produced a slightly positively skewed, leptokurtic distribution. The WHIMM Global Self-Efficacy subscales together yielded a mean score of 4.87 with a slightly negatively-skewed and leptokurtic distribution. The WHIMM Substance Use form need subscales yielded a mean score of 2.99, producing a non-skewed, leptokurtic distribution. The WHIMM Substance Use self-efficacy subscales produced a mean score of 3.39, with a normal distribution. The minimum mean scores for these composite scores ranged from 1.0 to 1.1; the maximum mean scores ranged from 5.36 to 6.0.

Mean scores for deficiency-based need subscales (Physiological Deficiencies, Safety, Belongingness, and Self-Transcendence Deficiencies) were greater for the Substance Use form than for the Global form, indicating responses that reflect more agreement with these items when using alcohol or other drugs than when not using substances. The reverse was observed for growth needs (Physiological Attainments, Self-Actualization, Esteem, and Self-Transcendence Attainments), indicating participants reported stronger agreement with these needs met globally than within the context of substance use. Mean subscores for Biological Self-Efficacy, Psychological Self-Efficacy, Social Self-Efficacy, and Spiritual Self-Efficacy also yielded greater scores for the Global form than for the Substance Use form, again indicating stronger agreement with the

presence of self-efficacy in meeting needs globally than in meeting needs within the context of substance use.

Results for Hypothesis One

Analysis of the full scale Cronbach’s alpha inter-item reliability for the WHIMM Global and WHIMM Substance Use forms yielded an overall reliability coefficient of .97 for each form. The WHIMM Global form overall mean was 3.72, with a standard deviation of .41 and a standard error of measurement of .07. The WHIMM Substance Use form overall mean was 3.19 with a standard deviation of .66 and a standard error of measurement of .11. Table 4.1 presents the Cronbach’s alpha inter-item reliability coefficients, means, standard deviations (SD), standard errors of measurement (SEM), and number of items for each subscale of the WHIMM Global and WHIMM Substance Use forms. Results support acceptance of hypothesis one, as no Cronbach’s coefficient alpha for any subscale fell below .90.

Table 4.1

WHIMM Global and Substance Use Form Subscales: Reliability Coefficients (r), Subscale Means, Standard Errors of Measurement, SD, and Item Counts

Subscale	<i>r</i>	Mean	SD	SEM	Items
Global Physiological Deficiency	.92	2.20	.99	.28	15
Global Physiological Attainments	.90	4.24	.91	.29	15
Global Safety	.96	2.01	1.07	.21	15
Global Self-Actualization	.95	4.73	.82	.18	15
Global Belongingness	.96	2.93	1.24	.25	15
Global Esteem	.95	4.43	.97	.22	15

Table 4.1

WHIMM Global and Substance Use Form Subscales: Reliability Coefficients (r),

Subscale Means, Standard Errors of Measurement, SD, and Item Counts

Subscale	<i>r</i>	Mean	SD	SEM	Items
Global Spiritual Deficiencies	.96	2.38	1.19	.24	15
Global Spiritual Attainments	.97	3.81	1.42	.25	15
Global Biological Self-Efficacy	.95	5.23	.81	.18	10
Global Psychological Self-Efficacy	.95	4.90	.91	.20	10
Global Social Self-Efficacy	.96	4.88	.95	.19	10
Global Spiritual Self-Efficacy	.97	4.49	1.30	.23	10
Substance Use Physiological Deficiency	.93	2.71	1.12	.30	15
Substance Use Physiological Attainments	.94	3.54	1.17	.29	15
Substance Use Safety	.97	2.17	1.21	.21	15
Substance Use Self-Actualization	.97	3.80	1.31	.23	15
Substance Use Belongingness	.97	2.95	1.29	.22	15
Substance Use Esteem	.98	3.01	1.30	.18	15
Substance Use Spiritual Deficiencies	.96	2.88	1.27	.25	15
Substance Use Spiritual Attainments	.97	2.83	1.30	.23	15
Substance Use Biological Self-Efficacy	.97	4.22	1.35	.23	10
Substance Use Psychological Self-Efficacy	.97	3.93	1.37	.24	10
Substance Use Social Self-Efficacy	.97	3.83	1.39	.24	10
Substance Use Spiritual Self-Efficacy	.98	3.37	1.45	.21	10

Results for Hypothesis Two

The researcher used a principal components analysis (PCA) with Varimax rotation to reduce the items into a smaller number of factors, to estimate the variance explained by each factor, and to reveal the latent structure of the WHIMM. Although it was anticipated that an oblimin rotation would yield a meaningful factor structure, this procedure did not produce single-factor loadings for many of the variables. It is possible that the item selection process, which relied on strong inter-correlation of items for reducing the items within each subscale, also influenced the retained items such that PCA produced more single-loading variables. The PCA with Varimax rotation yielded data that produced clear and meaningful factor structures for each form and for both needs and self-efficacy variables. PCA with Varimax rotation was therefore used consistently for all EFA procedures.

EFA procedures were used separately for the Global and Substance Use forms of the WHIMM as a result of the underlying assumption that the two forms did not measure identical constructs despite the analogous item format. Within each form of the WHIMM, EFA with the items based on needs were conducted separately from the items based on self-efficacy. This decision was made by the researcher as a result of the Williams Hierarchical Model's separation of needs and self-efficacy as distinct constructs.

The significance of Bartlett's tests of sphericity and the magnitude of the Kaiser-Meyer-Olkin (KMO) measures of sampling adequacy for the Global needs, Substance Use needs, Global self-efficacy, and Substance Use self-efficacy items indicate the data meet the assumptions of EFA (Table 4.2). These assumptions include an adequate

sample size for conducting EFA as measured by the KMO and adequate correlations among the data to produce factors, determined by the Bartlett's test of sphericity.

Table 4.2

KMO Measure of Sampling Adequacy and Bartlett's Test of Sphericity for Global Needs, Substance Use Needs, Global Self-Efficacy, and Substance Use Self-Efficacy

	KMO Measure of Sampling Adequacy	Bartlett's Test of Sphericity
Global Needs	.96	$X^2(7140)=69230.30, p<.001$
Substance Use Needs	.96	$X^2(7140)=81232.04, p<.001$
Global Self-Efficacy	.97	$X^2(780)=27639.61, p<.001$
Substance Use Self-Efficacy	.98	$X^2(780)=34949.19, p<.001$

Initial EFA conducted without a pre-determined number of factors to be extracted yielded a total of 15 extracted factors for the Global Need items, 13 extracted factors for the Substance Use Need items, four extracted factors for the Global Self-Efficacy items, and three factors for the Substance Use Self-Efficacy items. In all cases, an eigenvalue of one was selected as the lower limit for factor loadings. Factor loadings, percent variance, and cumulative variance for the WHIMM Global Needs, WHIMM Substance Use Needs, WHIIM Global Self-Efficacy, and WHIMM Substance Use Self-Efficacy items are presented in tables 4.3 Through 4.6 below.

Table 4.3

Eigenvalues, Percent Variance, and Cumulative

Variance for Factors for WHIMM Global Need Items

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	35.98	29.98	29.98
2	13.95	11.63	41.61
3	8.59	7.16	48.77
4	5.26	4.38	53.15
5	4.06	3.38	56.53
6	2.62	2.18	58.71
7	2.27	1.89	60.60
8	1.94	1.62	62.22
9	1.63	1.36	63.58
10	1.48	1.24	64.81
11	1.29	1.08	65.89
12	1.25	1.04	66.93
13	1.16	0.96	67.90
14	1.10	0.92	68.82
15	1.04	0.87	69.68

Table 4.4

Eigenvalues, Percent Variance, and Cumulative Variance

for Factors for WHIMM Substance Use Need Items

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	34.37	28.65	28.65

Table 4.4

*Eigenvalues, Percent Variance, and Cumulative Variance
for Factors for WHIMM Substance Use Need Items*

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
2	22.39	18.66	47.30
3	7.20	6.00	53.30
4	5.61	4.67	57.97
5	4.10	3.42	61.39
6	3.05	2.54	63.93
7	2.72	2.27	66.20
8	2.01	1.68	67.87
9	1.51	1.26	69.13
10	1.44	1.20	70.33
11	1.18	0.98	71.31
12	1.05	0.87	72.18
13	1.04	0.86	73.04

Table 4.5

*Eigenvalues, Percent Variance, and Cumulative
Variance for Factors for WHIMM Global Self-Efficacy
Items*

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	21.68	54.20	54.20
2	4.74	11.84	66.04
3	2.02	5.04	71.08

4 1.08 2.70 73.78

Table 4.6

Eigenvalues, Percent Variance, and Cumulative Variance for Factors for WHIMM Substance Use Self-Efficacy Items

Component	Initial Eigenvalues		
	Total	% of Variance	Cumulative %
1	26.14	65.36	65.36
2	3.99	9.97	75.33
3	1.53	3.82	79.15

Communalities for the Global need items ranged from .41 to .88. Communalities for the Substance Use need items ranged from .51 to .88. Communalities for the Global self-efficacy items ranged from .57 to .90. Communalities for the Substance Use self-efficacy items ranged from .64-.89. These communalities suggest adequate shared variance between each factor and its component variables. For all rotated factor solutions, values less than .4 were excluded from reporting due to their relatively weak rotated factor loadings. Results of the EFA using PCA with Varimax Rotation are presented below in tables 4.7 through 4.10.

Table 4.7

WHIMM Global Needs Rotated Component Matrix and Communalities

	Component															Communalities
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
PhysDef1								0.58								0.57

Table 4.7

WHIMM Global Needs Rotated Component Matrix and Communalities

	Component															Communalities
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
PhysDef2	0.40						0.60									0.70
PhysDef3	0.54									-0.48						0.73
PhysDef5	0.52															0.62
PhysDef6	0.53															0.60
PhysDef8							0.63									0.67
PhysDef10	0.66															0.65
PhysDef11	0.41															0.57
PhysDef15	0.47								0.60							0.74
PhysDef18									0.62							0.74
PhysDef19	0.42						0.63									0.68
PhysDef20	0.50						0.46									0.60
PhysDef21	0.44						0.48									0.59
PhysDef22							0.64									0.69
PhysDef23	0.63															0.61
PhysAttain1						0.57										0.47
PhysAttain3						0.48										0.64
PhysAttain4						0.56										0.72
PhysAttain7						0.64										0.56
PhysAttain8						0.43	-0.44						0.45			0.68
PhysAttain10													0.58			0.69
PhysAttain11																0.62
PhysAttain12						0.59										0.60
PhysAttain13						0.74										0.64
PhysAttain14						0.45			0.60							0.68
PhysAttain15						0.64										0.59
PhysAttain17						0.76										0.67
PhysAttain18									0.62							0.70

Table 4.7

WHIMM Global Needs Rotated Component Matrix and Communalities

	Component															Communalities
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
PhysAttain19																0.41
PhysAttain20				0.43											0.49	0.66
Safety1		0.56							0.61							0.76
Safety2		0.79														0.74
Safety3		0.58							0.58							0.78
Safety5		0.75														0.71
Safety6		0.58							0.62							0.82
Safety7		0.50														0.69
Safety8		0.82														0.76
Safety9		0.79														0.76
Safety10		0.77														0.70
Safety11		0.59							0.60							0.80
Safety14		0.73														0.75
Safety15		0.78														0.74
Safety18		0.75														0.71
Safety19		0.81														0.73
Safety23		0.42							0.61							0.76
SelfAct3				0.64												0.60
SelfAct5				0.68												0.71
SelfAct6				0.72												0.67
SelfAct7				0.62												0.59
SelfAct8				0.72												0.68
SelfAct9				0.70												0.69
SelfAct10				0.69												0.67
SelfAct11				0.75												0.72
SelfAct12				0.71												0.70
SelfAct16				0.60												0.69

Table 4.7

WHIMM Global Needs Rotated Component Matrix and Communalities

	Component															Communalities
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
SelfAct18				0.68												0.63
SelfAct19				0.58												0.64
SelfAct21				0.65												0.72
SelfAct22				0.57							0.45					0.66
SelfAct24				0.66												0.72
Belong2			0.74													0.70
Belong3			0.75													0.72
Belong6			0.72													0.66
Belong7			0.80													0.77
Belong8			0.75													0.74
Belong9			0.74													0.75
Belong10			0.76													0.64
Belong15			0.64													0.63
Belong16			0.68													0.73
Belong17			0.58													0.66
Belong19			0.68													0.66
Belong21			0.69													0.74
Belong22			0.72													0.62
Belong23			0.69													0.63
Belong24			0.75													0.72
Esteem1				0.57												0.53
Esteem5				0.58												0.63
Esteem6				0.63												0.69
Esteem7				0.62										0.41		0.73
Esteem8				0.74												0.72
Esteem9				0.63												0.65
Esteem12				0.60												0.68

Table 4.7

WHIMM Global Needs Rotated Component Matrix and Communalities

	Component															Communalities	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		
Esteem14					0.67												0.70
Esteem17					0.68												0.71
Esteem18					0.71												0.74
Esteem20					0.69												0.74
Esteem21					0.71												0.74
Esteem22					0.68												0.67
Esteem23					0.57												0.52
Esteem25				0.40	0.66												0.70
DefSpir1			0.42				0.47										0.79
DefSpir2							0.49										0.66
DefSpir3	-0.57						0.52										0.78
Defspir4							0.52										0.65
DefSpir5	-0.45						0.55										0.76
DefSpir6			0.43				0.52										0.82
DefSpir9							0.54										0.74
DefSpir10	-0.51						0.56										0.75
DefSpir12							0.61										0.66
DefSpir17	-0.59						0.55										0.82
DefSpir18							0.51										0.75
DefSpir21	-0.63						0.56										0.83
DefSpir22							0.58										0.66
DefSpir23	-0.58						0.60										0.82
DefSpir25							0.54										0.76
GrowSpir1	0.74																0.62
GrowSpir2	0.72																0.69
GrowSpir4	0.81																0.77
GrowSpir5	0.85																0.79

Table 4.7

WHIMM Global Needs Rotated Component Matrix and Communalities

	Component															Communalities
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	
GrowSpir6	0.87															0.86
GrowSpir8	0.85															0.80
GrowSpir9	0.72															0.71
GrowSpir11	0.81															0.74
GrowSpir13	0.82															0.72
GrowSpir17	0.86															0.78
GrowSpir20	0.86															0.80
GrowSpir22	0.91															0.88
GrowSpir23	0.74															0.63
GrowSpir24	0.89															0.83
GrowSpir25	0.89															0.85

Table 4.8

WHIMM Substance Use Needs Rotated Component Matrix and Communalities

	Component													Communalities	
	1	2	3	4	5	6	7	8	9	10	11	12	13		
SAPhysDef1								0.67							0.67
SAPhysDef2								0.63							0.71
SAPhysDef3								0.64							0.54
SAPhysDef5	0.41														0.51
SAPhysDef6	0.49														0.58
SAPhysDef8								0.65							0.65
SAPhysDef10	0.64														0.68
SAPhysDef11								0.56							0.61

Table 4.8

WHIMM Substance Use Needs Rotated Component Matrix and Communalities

	Component													Communalities	
	1	2	3	4	5	6	7	8	9	10	11	12	13		
SAPhysDef15	0.74														0.84
SAPhysDef18	0.72														0.82
SAPhysDef19	0.56							0.51							0.69
SAPhysDef20								0.53							0.66
SAPhysDef21	0.52														0.61
SAPhysDef22	0.46							0.58							0.68
SAPhysDef23	0.58														0.62
SAPhysAttain1					0.52										0.55
SAPhysAttain3					0.59					0.41					0.68
SAPhysAttain4					0.60										0.68
SAPhysAttain7					0.64										0.64
SAPhysAttain8					0.72										0.69
SAPhysAttain10					0.67										0.67
SAPhysAttain11					0.68										0.61
SAPhysAttain12					0.58										0.63
SAPhysAttain13					0.71										0.72
SAPhysAttain14					0.69										0.67
SAPhysAttain15					0.59										0.60
SAPhysAttain17					0.67										0.70
SAPhysAttain18					0.67										0.74
SAPhysAttain19					0.65										0.59
SAPhysAttain20					0.69										0.70
SASafety1	0.82														0.89
SASafety2	0.86														0.82
SASafety3	0.83														0.88

Table 4.8

WHIMM Substance Use Needs Rotated Component Matrix and Communalities

	Component													Communalities	
	1	2	3	4	5	6	7	8	9	10	11	12	13		
SASafety5	0.85														0.82
SASafety6	0.83														0.88
SASafety7	0.63														0.68
SASafety8	0.85														0.83
SASafety9	0.81														0.82
SASafety10	0.81														0.81
SASafety11	0.78														0.82
SASafety14	0.81														0.79
SASafety15	0.82														0.79
SASafety18	0.77														0.77
SASafety19	0.80														0.78
SASafety23	0.68														0.74
SASelfAct3						0.54									0.67
SASelfAct5						0.66									0.70
SASelfAct6		0.41				0.65									0.74
SASelfAct7						0.62									0.66
SASelfAct8						0.65									0.68
SASelfAct9						0.67									0.73
SASelfAct10						0.67									0.71
SASelfAct11						0.69									0.80
SASelfAct12						0.67									0.80
SASelfAct16						0.64									0.76
SASelfAct18						0.61									0.69
SASelfAct19		0.49				0.58									0.76
SASelfAct21		0.41				0.63									0.74

Table 4.8

WHIMM Substance Use Needs Rotated Component Matrix and Communalities

	Component													Communalities	
	1	2	3	4	5	6	7	8	9	10	11	12	13		
SASelfAct22		0.43				0.63									0.75
SASelfAct24		0.44				0.63									0.81
SABelong2			0.74												0.73
SABelong3			0.78												0.75
SABelong6			0.81												0.80
SABelong7			0.82												0.82
SABelong8			0.79												0.77
SABelong9			0.79												0.83
SABelong10			0.71												0.61
SABelong15			0.68												0.63
SABelong16			0.78												0.78
SABelong17			0.69												0.66
SABelong19			0.78												0.73
SABelong21			0.73												0.80
SABelong22			0.69												0.62
SABelong23			0.76												0.72
SABelong24			0.81												0.81
SAEsteem1		0.71													0.61
SAEsteem5		0.78													0.76
SAEsteem6		0.80													0.77
SAEsteem7		0.83													0.80
SAEsteem8		0.81													0.79
SAEsteem9		0.81													0.77
SAEsteem12		0.79													0.76
SAEsteem14		0.83													0.82

Table 4.8

WHIMM Substance Use Needs Rotated Component Matrix and Communalities

	Component													Communalities	
	1	2	3	4	5	6	7	8	9	10	11	12	13		
SAEsteem17		0.80													0.79
SAEsteem18		0.87													0.85
SAEsteem20		0.85													0.83
SAEsteem21		0.83													0.80
SAEsteem22		0.83													0.80
SAEsteem23		0.68													0.56
SAEsteem25		0.78													0.78
SADefSpir1			0.48				0.45								0.68
SADefSpir2			0.42				0.47								0.57
SADefSpir3							0.76								0.79
SADefSpir4							0.62								0.66
SADefSpir5							0.75								0.75
SADefSpir6			0.46				0.48								0.72
SADefSpir9			0.47				0.55								0.74
SADefSpir10							0.65								0.69
SADefSpir12							0.64								0.67
SADefSpir17							0.80								0.83
SADefSpir18			0.45				0.50								0.66
SADefSpir21							0.76								0.74
SADefSpir22							0.67								0.68
SADefSpir23							0.82								0.80
SADefSpir25			0.44				0.62								0.75
SAGrowSpir1				0.64											0.60
SAGrowSpir2				0.73											0.74
SAGrowSpir4				0.75											0.74

Table 4.8

WHIMM Substance Use Needs Rotated Component Matrix and Communalities

	Component													Communalities		
	1	2	3	4	5	6	7	8	9	10	11	12	13			
SAGrowSpir5				0.80												0.75
SAGrowSpir6				0.84												0.83
SAGrowSpir8				0.80												0.81
SAGrowSpir9				0.79												0.77
SAGrowSpir11				0.76												0.72
SAGrowSpir13				0.84												0.80
SAGrowSpir17				0.76												0.80
SAGrowSpir20				0.75									0.45			0.83
SAGrowSpir22				0.81												0.79
SAGrowSpir23				0.70									0.49			0.83
SAGrowSpir24				0.78												0.77
SAGrowSpir25				0.80												0.78

Table 4.9

WHIMM Global Self-Efficacy Rotated Component Matrix and Communalities

	Component				Communalities
	1	2	3	4	
SEDefPhys3				0.65	0.61
SEDefPhys4				0.75	0.69
SEDefPhys6				0.79	0.74
SEDefPhys8				0.80	0.73
SEDefPhys9				0.78	0.72
SEDefPhys11				0.82	0.75

Table 4.9

WHIMM Global Self-Efficacy Rotated Component Matrix and Communalities

	Component				Communalities
	1	2	3	4	
SEGroPhys2	0.68				0.65
SEGroPhys5	0.60				0.57
SEGrowPhys11	0.82				0.78
SEGroPhys12	0.77				0.70
SESafe2	0.41			0.64	0.81
SESafe3	0.68				0.64
SESafe6				0.73	0.85
SESafe7		0.45		0.70	0.85
SESafe9	0.46	0.53			0.55
SESelfAct4	0.41	0.56		0.44	0.73
SESelfAct9	0.54	0.55			0.70
SESelfAct10		0.59			0.59
SESelfAct11	0.53	0.56			0.67
SESelfAct12		0.64			0.73
SEBelong3	0.42	0.66			0.72
SEBelong4		0.78			0.77
SEBelong5		0.77			0.74
SEBelong6		0.66			0.63
SEBelong11		0.76			0.73
SEEsteem2		0.76			0.79
SEEsteem4		0.70			0.73
SEEsteem6		0.70			0.73
SEEsteem9		0.70			0.69
SEEsteem12	0.50	0.64			0.73

Table 4.9

WHIMM Global Self-Efficacy Rotated Component Matrix and Communalities

	Component				Communalities
	1	2	3	4	
SEDefSpir3			0.78		0.75
SEDefSpir10			0.88		0.85
SEDefSpir11			0.90		0.89
SEDefSpir12			0.85		0.81
SEGrowSpir1			0.89		0.86
SEGrowSpir2			0.69		0.70
SEGrowSpir3		0.46	0.58		0.65
SEGrowSpir8			0.89		0.89
SEGrowSpir11			0.93		0.90
SEGrowSpir12			0.91		0.88

Table 4.10

WHIMM Substance Use Self-Efficacy Rotated Component Matrix and Communalities

	Component			Communalities
	1	2	3	
SASEDefPhys3	0.66			0.64
SASEDefPhys4	0.76			0.74
SASEDefPhys6	0.83			0.80
SASEDefPhys8	0.84			0.77
SASEDefPhys9	0.83			0.81
SASEDefPhys11	0.85			0.82
SASEGroPhys2	0.80			0.78
SASEGrowPhys5	0.72			0.73

Table 4.10

WHIMM Substance Use Self-Efficacy Rotated Component Matrix and Communalities

	Component			Communalities
	1	2	3	
SASEGrowPhys11	0.87			0.86
SASEGrowPhys12	0.80			0.74
SASESafe2	0.69	0.43		0.72
SASESafe3	0.74			0.76
SASESafe6	0.65	0.50		0.73
SASESafe7	0.67	0.47		0.73
SASESafe9	0.67	0.49		0.75
SASESelfAct4	0.62	0.56		0.79
SASESelfAct9	0.63	0.48		0.77
SASESelfAct10	0.56	0.57		0.75
SASESelfAct11	0.55	0.61		0.78
SASESelfAct12	0.56	0.59		0.77
SASEBelong3	0.47	0.66		0.80
SASEBelong4	0.42	0.69	0.41	0.82
SASEBelong5		0.73		0.79
SASEBelong6	0.41	0.67		0.76
SASEBelong11		0.72		0.78
SASEEsteem2	0.46	0.73		0.85
SASEEsteem4		0.74		0.83
SASEEsteem6		0.76		0.80
SASEEsteem9	0.40	0.70		0.77
SASEEsteem12	0.47	0.69		0.82
SASEDefSpir3			0.79	0.79
SASEDefSpir10			0.86	0.86

Table 4.10

WHIMM Substance Use Self-Efficacy Rotated Component Matrix and Communalities

	Component			Communalities
	1	2	3	
SASEDefSpir11			0.87	0.87
SASEDefSpir12			0.87	0.86
SASEGrowSpir1			0.88	0.86
SASEGrowSpir2			0.71	0.76
SASEGrowSpir3		0.52	0.61	0.77
SASEGrowSpir8			0.85	0.87
SASEGrowSpir11			0.90	0.89
SASEGrowSpir12			0.88	0.88

Table 4.11 provides information on the percent of variance accounted for based upon the results of the EFA presented above. Specific information for the WHIMM Global need items, the WHIMM Substance Use need items, the WHIMM Global self-efficacy items, and the WHIMM Substance Use self-efficacy items are provided. Self-efficacy factors for both the WHIMM Global and Substance Use forms accounted for greater variance percentages than the WHIMM need factors for both of these forms.

Table 4.11

WHIMM Needs and Self-Efficacy Scales Percent of Variance Accounted for: Global and Substance Use Forms

Items	Percent of Variance Accounted For
WHIMM Global Needs	69.68

WHIMM Substance Use Needs	73.04
WHIMM Global Self-Efficacy	73.78
WHIMM Substance Use Self Efficacy	79.15

The obtained factor structures of the WHIMM described previously loosely support the structure and constructs contained within the Williams Hierarchical Integrated Model. Within the WHIMM Global Needs factors, the Physiological Deficiency variables yielded the fewest items subsumed within a sole factor; this may be due at least in part to the variation in item content that was included to represent a broad range of physiological deficiencies. WHIMM Global Physiological Attainments and Safety items generally loaded onto discrete factors, although several items in each of these factors double-loaded onto another factor as well. The alternate loadings for the Global Physiological Attainments items were inconsistent, while the alternate loadings for the Safety items generally aligned with factors that also contained Global Physiological Deficiencies items. This may indicate an overlap between operationalization of constructs within the Safety and Physiological Deficiency items within the current version of the WHIMM. Self-Actualization, Belongingness, Esteem, and Self-Transcendence Attainments items generally loaded onto discrete factors, with no dually-loaded items observed for the Belongingness nor the Self-Transcendence Attainments factors. One dual loading was observed within the Self-Actualization factor and two dual loadings were observed among items within the Esteem factor. These items may represent poor items, as they did not load in meaningful ways onto other observed factors. The Self-Transcendence Deficiency items loaded consistently into a discrete

factor; approximately half of these items also loaded negatively within the Self-Transcendence Attainments factor, indicating an inverse relationship between these two factors based upon these loadings. Two of these items loaded simultaneously into the Self-Transcendence Deficiencies factor and into the Belongingness factor. These items may be poorly suited for inclusion in the WHIMM as a result.

Factor loadings for the WHIMM Substance Use Needs items were generally concordant with the loadings for the WHIMM Global Needs items, although the Substance Use Need items factored more discretely than those items included in the Global Needs EFA. Substance Use Physiological Deficiencies yielded the fewest items subsumed within a sole factor, again possibly due to the wide range of item content included among these variables. Approximately half of these items loaded into the Safety factor, indicating potential overlap between the content of these items and the Safety items. Substance Use Physiological Attainment items, Safety items, Belongingness items, Esteem items, and Self-Transcendence Attainment items generally produced discrete factors. Two items were dually-loaded between the Self-Transcendence Attainment factor and another factor, one item dually loaded onto the Physiological Attainments factor and another factor, and no items loaded onto more than one factor for the Safety, Belongingness and Esteem items for the WHIMM Substance Use form. No meaningful dual loadings were observed among items, possibly indicating that these dually-loaded variables are poor items. The Self-Actualization items for the Substance Use form loaded onto a discrete factor. Five of these items also dually loaded onto the Esteem factor of this form. Similarly, the Self-Transcendence Deficiency items loaded onto a discrete factor, while six items also dually loaded onto the Belongingness factor

within the Substance Use form. Given these observations, which are unique to the WHIMM Substance Use Need items EFA, potential overlap between constructs assessed by these items specifically within the Substance Use form is possible. This may be due, at least in part, to the relationship between deficiency and growth items within the scale, as both Esteem and Self-Actualization are growth needs and both Self-Transcendence Deficiency items and the Belongingness items addressed deficiency needs. Within the domain of substance use, it is possible that responses to these items fall into a consistent pattern not observed with the WHIMM Global form due to the influence of substance use that may be concordant across deficiency needs and concordant across growth needs.

Among the factors obtained by EFA for the WHIMM Global Self-Efficacy items, the Biological Self-Efficacy items loaded onto a discrete factor, with no dual loadings observed. The Social Self-Efficacy and Spiritual Self-Efficacy items loaded onto two discrete factors as well, although two Social Self-Efficacy items also loaded onto the Biological Self-Efficacy factor and One Spiritual Self-Efficacy item loaded onto the Esteem factor. These dual loadings may represent items that are a poor fit for the instrument. The Psychological Self-Efficacy items loaded poorly, with six items double-loading onto both the Biological Self-Efficacy factor and the Social Self-Efficacy factor, three items loading onto the Social Self-Efficacy factor, and only two items loading solely onto a separate factor. Two additional items loaded onto this factor while also loading onto one or more of the other factors described previously. Explanations for these poor loadings are unclear.

The WHIMM Substance Use Self-Efficacy items produced three factors. The Biological Self-Efficacy and Spiritual Self-Efficacy items produced two discrete factors;

only one item in the Spiritual Self-Efficacy factor dually loaded into the third factor. Interestingly, the Psychological items loaded dually onto the Biological and Social Self-Efficacy factors, with all but one item dually loading onto both factors. Social Self-Efficacy items loaded into the third discrete factor, although half of these items also loaded onto the Biological Self-Efficacy factor and one item loaded onto all three factors. While these poor loadings are somewhat consistent with the loadings of the items within the WHIMM Global Self-Efficacy form, additional studies will be needed to determine the reasons for these findings.

The overall factor structures of the WHIMM Global and WHIMM Substance Use forms related to need items are congruent with the Williams Hierarchical Integrated Model. While some items loaded poorly, the observed factors represent constructs described within the Williams Hierarchical Integrated Model. The Global and Substance Use Self-Efficacy factors somewhat support the self-efficacy constructs described in the Williams Hierarchical Integrated Model, although the overlap between items addressing Psychological Self-Efficacy and Social Self-Efficacy do not, according to the EFA procedures conducted here, represent distinct factors. Based upon these EFA analyses, Hypothesis Two is accepted for the WHIMM Global and Substance Use Need items and partially accepted for the WHIMM Global and Substance Use Self-Efficacy items; discrete factors were observed for the Self-Efficacy items, although items did not load neatly into the four obtained factors for Global Self-Efficacy and loaded into only three factors for Substance Use Self-Efficacy..

Results for Hypothesis Three

Given that the WHIMM Global and WHIMM Substance Use forms are analogous with the exception of the addition of the phrase, 'when I use alcohol or drugs' in the Substance Use form, the researcher used paired-sample *t*- tests to ensure that the two forms did not produce similar results. In other words, the researcher tested the hypothesis that the two form subscales would yield statistically significant differences in results when one subscale referenced global functioning and the other referenced functioning within the context of substance use. Overall, statistically significant differences were observed between subscales of the Global form of the WHIMM and the Substance Use form of the WHIMM; the Belongingness subscale was the only subscale that did not yield statistically significant differences between the Global and Substance Use forms of the WHIMM, indicating that mean scores on analogous subscales were different depending on the form being considered. In all cases, the WHIMM Global and Substance Use paired subscales yielded statistically significant correlation coefficients, with shared variance ranging from .08 to .42. This indicates that each form captures shared variance anticipated to exist between analogous forms and specific variance ranging from 58% to 92% depending on the strength of the correlation between the Global and Substance Use subscale being considered. As a result of these findings, hypothesis three is accepted. Tables 4.12 And 4.13 present the results of these statistical tests. Asterisks (*) are used to denote statistically significant *t* values ($p < .001$) in both of these tables.

Table 4.12

Correlation between WHIMM Global and WHIMM Substance Use Subscales (N=620)

	Correlation
Physiological Deficiencies Subscales	.53*
Physiological Attainments Subscales	.38*
Safety Subscales	.65*
Self-Actualization Subscales	.29*
Belongingness Subscales	.42*
Esteem Subscales	.29*
Self-Transcendence Deficiencies Subscales	.56*
Self-Transcendence Attainments Subscales	.50*
Biological Self-Efficacy Subscales	.33*
Psychological Self-Efficacy Subscales	.35*
Social Self-Efficacy Subscales	.31*
Spiritual Self-Efficacy Subscales	.43*

Table 4.13

Statistical Significance of Comparisons between WHIMM Global and WHIMM

Substance Use Form Subscales Using Paired-Sample t-Tests

	Paired Differences			<i>t</i>
	Mean	SD	SEM	
Physiological Deficiencies Subscales	-0.52	1.03	0.04	-12.58*
Physiological Attainments Subscales	0.70	1.18	0.05	14.79*

Table 4.13

*Statistical Significance of Comparisons between WHIMM Global and WHIMM**Substance Use Form Subscales Using Paired-Sample t-Tests*

	Paired Differences			<i>t</i>
	Mean	SD	SEM	
Safety Subscales	-0.16	0.95	0.04	-4.22*
Self-Actualization Subscales	0.92	1.33	0.05	17.27*
Belongingness Subscales	-0.02	1.36	0.05	-0.35
Esteem Subscales	1.41	1.38	0.06	25.53*
Self-Transcendence Deficiencies Subscales	-0.50	1.16	0.05	-10.68*
Self-Transcendence Attainments Subscales	0.98	1.37	0.05	17.95*
Biological Self-Efficacy Subscales	1.01	1.32	0.05	18.95*
Psychological Self-Efficacy Subscales	0.97	1.36	0.05	17.84*
Social Self-Efficacy Subscales	1.05	1.42	0.06	18.47*
Spiritual Self-Efficacy Subscales	1.12	1.47	0.06	19.00*

Additional Analyses Conducted During WHIMM Development

The following section describes additional analyses conducted to further validate the WHIMM. Subscale correlations for the WHIMM Global and WHIMM Substance Use forms are presented and test-retest reliability analyses and results are described. Convergent and discriminant construct validity of the WHIMM based upon correlations between the WHIMM subscales and the AUDIT and the WHIMM subscales and the DAST are also reported in this section.

Subscale Correlations

Subscale correlations were computed to determine the relationships between subscales of the WHIMM and to ensure that each subscale retained specific variance, or variance that represents a unique contribution to the overall instrument. Pearson product-moment correlations (r) and statistical significance of correlations ($\alpha=.001$) for all subscales of WHIMM Global and Substance Use forms are provided in tables 4.14 through 4.15 below. The selected alpha level of .001 reduces the likelihood of identifying significant results that are a reflection of error inherent in multiple comparisons.

Generally, subscales of the WHIMM Global and Substance Use forms correlated at statistically significant levels with Pearson product-moment correlation coefficients generally indicating a moderate correlation between the subscales. The strongest correlation of .80 between the Global Physiological Deficiency and Global Safety subscales, represents a shared variance of .64, indicating that the specific variance for the two subscales is .36. Given that this is the strongest correlation and that specific variance of 36% was retained for these two subscales, the researcher concluded that each subscale contributed adequate unique variance to the overall scale to be retained. The correlations among the subscales are logical given the interrelated elements of the Williams Hierarchical Integrated Model, and each subscale also contributes unique variance not accounted for completely by the other subscales of the WHIMM. Generally, growth subscales were positively correlated, deficiency subscales were positively correlated, and growth and deficiency subscales were negatively correlated. The subscales that are positively correlated represent subscales with convergent validity, while the subscales

that are negatively correlated represent subscales with discriminant validity. In other words, positively correlated subscales measure constructs that are related, while negatively correlated subscales measure subscales that are inversely related. Weak and absent correlations represent subscales that have no demonstrated relationship, such as the correlation between Global Physiological Deficiencies and Global Spiritual Attainments ($r=-.01$). An asterisk (*) is used to identify correlation coefficients where $p<.001$ in the following tables.

Table 4.14

WHIMM Inter-Subscale Correlations (Pearson r) Part 1(N=620)

	Global Phys Def	Global Phys Attain	Global Safety	Global Self Act	Global Belong	Global Esteem	Global Def Spirit	Global Grow Spirit
Global Phys Attain	-.44*	1						
Global Safety	.80*	-.32*	1					
Global SelfAct	-.34*	.57*	-.38*	1				
Global Belong	.57*	-.34*	.60*	-.45*	1			
Global Esteem	-.29*	.52*	-.34*	.70*	-.54*	1		
Global DefSpirit	.52*	-.31*	.56*	-.47*	.63*	-.49*	1	
Global GroSpirit	-.01	.20*	-.01	.38*	-.18*	.38*	-.55*	1
SEBio	-.42*	.56*	-.43*	.64*	-.31*	.50*	-.39*	.20*
SEPsych	-.38*	.54*	-.41*	.77*	-.45*	.62*	-.52*	.32*
SESocial	-.35*	.55*	-.38*	.73*	-.52*	.67*	-.53*	.33*

Table 4.14

WHIMM Inter-Subscale Correlations (Pearson r) Part 1(N=620)

	Global	Global		Global		Global	Global	Global
	Phys	Phys	Global	Self	Global	Global	Def	Grow
	Def	Attain	Safety	Act	Belong	Esteem	Spirit	Spirit
SESpirit	-.15*	.35*	-.18*	.52*	-.32*	.49*	-.67*	.76*
SAPhys Def	.53*	-.24*	.49*	-.20*	.37*	-.14*	.35*	.09
SAPhys Attain	-.16*	.38*	-.07	.27*	-.08	.25*	-.02	.06
SASafety	.57*	-.24*	.65*	-.25*	.39*	-.16*	.38*	.09
SASelf Act	-.03	.23*	0.0	.29*	-.10	.30*	-.05	.12
SA Belong	.41*	-.25*	.40*	-.24*	.42*	-.21*	.34*	.01
SA Esteem	-.03	.23*	0.0	.17*	-.13*	.29*	.01	.07
SADef Spirit	.39*	-.18*	.39*	-.25*	.38*	-.20*	.56*	-.22*
SAGrow Spirit	.13*	.11	.15*	.16*	-.03	.20*	-.16*	.50*
SASEBio	-.20*	.24*	-.18*	.23*	-.07	.21*	-.05	0.0
SASE Psych	-.18*	.28*	-.16*	.29*	-.14*	.25*	-.08	.05
SASE Social	-.16*	.30*	-.10	.25*	-.15*	.24*	-.06	.05
SASE Spirit	-.06	.21*	-.01	.22*	-.14*	.20*	-.24*	.39*

Table 4.15

WHIMM Inter-Subscale Correlations Part 2

	SA Phys Def	SA Phys Attain	SA Safety	SA Self Act	SA Belong	SA Esteem	SA Def Spirit	SA Grow Spirit
SEBio	-.25*	.25*	-.36*	.18*	-.21*	.10	-.16*	.040
SE Psych	-.23*	.24*	-.30*	.24*	-.23*	.16*	-.24*	.15*
SE Social	-.22*	.25*	-.26*	.25*	-.22*	.18*	-.23*	.17*
SE Spirit	-.04	.09	-.07	.13	-.09	.07	-.31*	.42*
SAPhys Attain	-.32*	1						
SA Safety	.77*	-.20*	1					
SASelfAct	-.23*	.74*	-.10	1				
SA Belong	.64*	-.26*	.59*	-.25*	1			
SA Esteem	-.17*	.57*	-.06	.71*	-.24*	1		
SADef Spirit	.59*	-.20*	.52*	-.26*	.70*	-.21	1	
SA Grow Spirit	.01	.42*	.11	.48*	-.02	.52*	-.15*	1
SASE Bio	-.33*	.69*	-.32*	.67*	-.27*	.50*	-.23*	.31*
SASE Psych	-.34*	.67*	-.30*	.73*	-.37*	.59*	-.31*	.41*
SASE Social	-.31*	.66*	-.25*	.71*	-.41*	.65*	-.33*	.41*
SASE Spirit	-.19*	.51*	-.09	.59*	-.27*	.54*	-.42*	.69*

Test-Retest Reliability

The following section presents results related to the stability of the WHIMM.

Stability refers to the consistency of the test's results over time, and contributes to

instrument reliability. Tests with poor stability may not be appropriate to determine response to treatment or intervention, as poor stability may make real changes in response patterns indistinguishable from those resulting from an unstable instrument. Given the WHIMM's possible applicability in settings where response to treatment may be assessed, analysis of the WHIMM's stability fell within the parameters of the present study.

Stability can be determined through test-retest procedures, including computing the correlations between two administrations of the test over time and by comparing scores from two separate administrations using paired sample *t*-tests to determine whether statically significant differences exist between scores obtained in two separate administrations. A stable instrument will yield high test-retest correlation coefficients and non-significant results for paired *t*-test comparisons of scores from two separate administrations assuming the constructs measured by the instrument are also stable. These guidelines were used for analysis of the stability of the WHIMM, as the WHIMM's constructs are hypothesized to remain stable assuming treatment, escalated substance use, or cessation of substance use do not occur within the test-retest window. Data were collected from a sub-sample of participants ($n=50$) who completed the pilot version of the WHIMM and also completed the final version of the WHIMM in a re-contact administration approximately three to four weeks after the first administration, with a test-retest range between 21 and 30 days depending on when individuals completed each administration of the instrument.

Pearson product-moment correlation coefficients (r) between pilot one and pilot one re-contact subscales generally equaled or exceeded .70. Exceptions to this included

the Global Physiological Attainments Subscale, which yielded a correlation coefficient of .29 between the first and second administrations; the Global Self-Actualization Subscale, which yielded a correlation coefficient of .67; the Global Biological Self-Efficacy Subscale, which yielded a correlation coefficient of .53; the Global Psychological Self-Efficacy Subscale, which yielded a correlation coefficient of .57; and the Substance Use Safety Subscale, which yielded a correlation coefficient of .68. Although each of the subscales identified fell below the .70 reliability threshold, the subscales other than the Global Physiological Attainments Subscale are statistically significant at an alpha level equal to or less than .001 (set to protect for alpha slippage due to multiple comparisons) and, with the exception of the Global Physiological Attainments Subscale, produce shared variance equal to or greater than 25% across the test-retest interval. The Global Physiological Attainments Subscale is the most likely to be influenced by a change to substance use patterns during even the relatively short interval used in the present study given its focus on physiological functioning. This may explain the relatively low correlation between the first and re-test administration of the WHIMM for this subscale. The correlation coefficient obtained is statistically significant at the .05 alpha level, although the correction for alpha slippage due to multiple comparisons renders this correlation non-significant at an alpha level of .001.

Generally, test-retest mean score comparisons resulted in non-significant differences at the .05 alpha level between the first and second administration scores for each subscale using the paired-sample *t*-test statistic. Two subscales, however, demonstrated statistically-significant differences between results obtained in pilot one and in the pilot one re-contact. The WHIMM Global Physiological Attainments Subscale

and the WHIMM Substance Use Self-Transcendence Deficiencies Subscale yielded statistically significant differences between pilot one and the pilot one re-contact when the alpha level was set at .05. When an alpha level of .001 was used to correct for alpha slippage, the observed test-retest difference between the WHIMM Global Physiological Attainments Subscale scores was no longer statistically significant ($p=.009$), while the difference between the WHIMM Substance Use Self-Transcendence Deficiencies Subscale scores remained statistically significant at this level ($p=.001$).

The overall effect size (Cohen's d) of the difference between the Global Physiological Attainments Subscale from first to second administration was a .39; this represents a small to medium effect size, indicating some degree of practical significance of this difference. The relatively small correlation coefficient coupled with the statistically significant difference between first and second administration scores may indicate that individuals experienced changes in global physiological attainments between the first and second administration that yielded these results. This is supported by a decrease in mean scores within this subscale between testing period one and testing period two. This is congruent with the possibility that global physiological attainments may be impacted by substance use even during the three-to-four week span that passed between administration periods.

The overall effect size of the difference between the Substance Use Self-Transcendence Deficiencies Subscale from first to second administration was a .52, a medium effect size that indicates some degree of practical significance of this difference. These two subscales yielded a correlation coefficient of $r=.79$, indicating that these subscale scores remained related despite the difference in mean scores from the first to

the re-contact administration. These results suggest that participants responded consistently to both administrations of the WHIMM; the overall score increase also suggests they experienced an increase in Substance Use Self-Transcendence Deficiencies during this period. This indicates that individuals reported increased agreement with the deficiency items related to self-transcendence when using alcohol or other drugs during the second administration of the WHIMM, which is congruent with increased substance use and also is in accord with the decreased scores on the Global Physiological Attainments Subscale observed during the test-retest reliability analyses. Full test-retest correlation coefficients (r) and paired-sample t -test results are provided in table 4.16 and table 4.17. Statistically significant correlations and t values ($p < .001$) are indicated with an asterisk (*).

Table 4.16

WHIMM Test-Retest Reliability Subscale Correlations (n=50)

Subscales Compared (first and re-contact)	Correlation
Global Physiological Deficiency Subscales	.82*
Global Physiological Attainments Subscales	.28
Global Safety Subscales	.71*
Global Self-Actualization Subscales	.67*
Global Belongingness Subscales	.82*
Global Esteem Subscales	.79*
Global Self-Transcendence Deficiencies Subscales	.76*
Global Self-Transcendence Attainments Subscales	.90*
Global Biological Self-Efficacy	.53*

Global Psychological Self-Efficacy	.57*
Global Social Self-Efficacy	.81*
Global Spiritual Self-Efficacy	.85*
Substance Use Physiological Deficiency Subscales	.84*
Substance Use Physiological Attainments Subscales	.73*
Substance Use Safety Subscales	.68*
Substance Use Self-Actualization Subscales	.81*
Substance Use Belongingness Subscales	.73*
Substance Use Esteem Subscales	.73*
Substance Use Self-Transcendence Deficiencies Subscales	.79*
Substance Use Self-Transcendence Attainments Subscales	.78*
Substance Use Biological Self-Efficacy	.78*
Substance Use Psychological Self-Efficacy	.73*
Substance Use Social Self-Efficacy	.87*
Substance Use Spiritual Self-Efficacy	.88*

Table 4.17

WHIMM Test-Retest Reliability Paired-Sample t-Test t Values

	1 st	1 st	2 nd	2 nd	Paired Differences			<i>t</i>
	Mean	SD	Mean	SD	Mean	SD	df	
Global Physiological Deficiency Subscales	2.08	.79	1.99	.84	0.09	0.49	49	1.33

Table 4.17

WHIMM Test-Retest Reliability Paired-Sample t-Test t Values

	1 st	1 st	2 nd	2 nd	Paired Differences			<i>t</i>
	Mean	SD	Mean	SD	Mean	SD	df	
Global Physiological								
Attainments	4.26	.78	3.81	1.14	0.46	1.18	49	2.72
Global Safety	1.91	.79	1.92	.97	-0.01	0.69	49	-0.10
Global Self- Actualization	4.64	.74	4.77	.63	-0.12	0.56	49	-1.55
Global Belongingness	2.82	1.17	2.93	1.17	-0.12	0.71	49	-1.15
Global Esteem	4.38	1.00	4.51	.86	-0.14	0.61	49	-1.59
Global Self- Transcendence	2.12	1.08	2.27	1.12	-0.14	0.77	49	-1.32
Deficiencies								
Global Self- Transcendence	3.93	1.39	3.99	1.40	-0.06	0.61	49	-0.69
Attainments								
Global Biological Self-Efficacy	5.32	.64	5.42	.56	-0.09	0.59	49	-1.13
Global Psychological Self-Efficacy	4.93	.89	5.06	.63	-0.13	0.74	49	-1.29

Table 4.17

WHIMM Test-Retest Reliability Paired-Sample t-Test t Values

	1 st	1 st	2 nd	2 nd	Paired Differences			<i>t</i>
	Mean	SD	Mean	SD	Mean	SD	df	
Global Social Self-Efficacy	4.87	.94	4.91	.89	-0.04	0.57	49	-0.49
Global Spiritual Self-Efficacy	4.65	1.27	4.65	1.11	0.00	0.66	49	-0.04
Substance Use Physiological Deficiency	2.53	.94	2.61	1.02	-0.08	0.55	49	-1.02
Substance Use Physiological Attainments	3.69	1.11	3.81	1.14	-0.12	0.82	49	-1.03
Substance Use Safety	1.85	.87	1.97	1.04	-0.13	0.78	49	-1.17
Substance Use Self-Actualization	3.61	1.22	3.71	1.25	-0.11	0.76	49	-1.01
Substance Use Belongingness	2.74	1.25	2.81	1.07	-0.07	0.87	49	-0.57
Substance Use Esteem	3.33	1.42	3.25	1.27	0.08	1.01	49	0.58

Table 4.17

WHIMM Test-Retest Reliability Paired-Sample t-Test t Values

	1 st	1 st	2 nd	2 nd	Paired Differences			<i>t</i>
	Mean	SD	Mean	SD	Mean	SD	df	
Substance Use Self- Transcendence Deficiencies	2.48	1.14	2.88	1.24	-0.40	0.78	49	-3.64*
Substance Use Self- Transcendence Attainments	3.02	1.40	3.11	1.31	-0.09	0.91	49	-0.68
Substance Use Biological Self- Efficacy	4.49	1.17	4.63	1.14	-0.14	0.77	49	-1.31
Substance Use Psychological Self- Efficacy	4.15	1.39	4.30	1.15	-0.14	0.96	49	-1.07
Substance Use Social Self-Efficacy	4.11	1.26	4.10	1.33	0.01	0.66	49	0.06
Substance Use Spiritual Self- Efficacy	3.78	1.48	3.87	1.32	-0.09	0.71	49	-0.92

Construct Validity

Construct validity was analyzed in part through obtaining concurrent Pearson product-moment correlation coefficients (r) for correlations between the AUDIT ($r=.86$; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001), a measure of alcohol use quantity, frequency, and consequences, and the DAST ($r=.92$; Skinner, 1982), a measure of drug use quantity, frequency, and consequences (Table 4.7). Given that the AUDIT measures frequency, quantity, and consequences of alcohol use and that the DAST measures frequency and consequences of other drug use, these instruments were selected with the goal of establishing convergent validity between these instruments and the WHIMM Global and Substance Use Physiological Attainments and Physiological Deficiency Subscales; it was anticipated that these instruments would not correlate strongly with the other WHIMM subscales due to their attention to psychological, social, spiritual, and self-efficacy constructs not included in the AUDIT or DAST, thereby establishing discriminant validity between these other WHIMM subscales and the AUDIT and these WHIMM subscales and the DAST.

The only statistically significant correlation between any WHIMM subscale and either the AUDIT or the DAST occurred between the WHIMM Substance Use Biological Self-Efficacy subscale and the AUDIT [$r=-.323$, $p=.025$], resulting in a negative moderate correlation between this subscale and the AUDIT. The variance shared between the AUDIT and the WHIMM Substance Use Biological Self-Efficacy subscale was .10, indicating that 90% of the variance observed remained specific to each respective instrument. When corrected for the possibility of family-wise error, this value is no longer statistically significant at the alpha level of .001. The negative correlation observed between physiological self-efficacy as measured on this subscale of the

WHIMM and the AUDIT total score is logical given the likely inverse relationship between alcohol consumption and self-efficacy to meet physiological needs when using alcohol or other drugs; nonetheless, these findings are not congruent with the anticipated convergent and discriminant validity findings hypothesized at the outset of this study. Based upon these findings, the WHIMM generally measures constructs that are different from those measured by the AUDIT and DAST. Table 4.18 presents the correlations between the WHIMM Subscales and the AUDIT and the WHIMM Subscales and the DAST. No significant correlations were obtained at the corrected .001 alpha level.

Table 4.18

WHIMM Subscale, AUDIT, and DAST Correlations (n=50)

	AUDIT	DAST
Physiological Deficiencies	.16	-.08
Physiological Attainments	-.13	-.02
Safety	.15	.09
Self-Actualization	.01	.11
Belongingness	.04	.04
Esteem	.26	-.04
Self-Transcendence Deficiencies	-.01	.04
Self-Transcendence Growth	.10	.08
Biological Self-Efficacy	-.11	.07
Psychological Self-Efficacy	-.09	.22
Social Self-Efficacy	-.01	.21
Spiritual Self-Efficacy	.19	.07

Table 4.18

WHIMM Subscale, AUDIT, and DAST Correlations (n=50)

	AUDIT	DAST
SA Physiological Deficiencies	.06	.09
SA Physiological Attainments	-.13	-.02
SA Safety	.15	.18
SA Self-Actualization	-.09	.08
SA Belongingness	-.05	-.02
SA Esteem	-.05	-.05
SA Self-Transcendence Deficiencies	-.03	.04
SA Self-Transcendence Growth	.04	.01
SA Biological Self-Efficacy	-.32	-.09
SA Psychological Self-Efficacy	-.13	.14
SA Social Self-Efficacy	-.01	.18
SA Spiritual Self-Efficacy	.08	.16

Conclusion

Overall, the WHIMM meets reliability criteria for instruments developed for use in research and also adheres to reliability standards for instruments used for placement decisions; all subscale reliability coefficients met or exceeded a Cronbach's alpha inter-item reliability coefficient of .90. The stability of the WHIMM over a three to four week period is congruent with its use as a treatment response instrument with test-retest reliability coefficients generally equally or exceeding .70. EFA procedures yielded

meaningful factor structures that loosely support the Williams Hierarchical Integrated Model. The WHIMM Global and Substance Use forms yielded statistically significant differences between scores on the two forms of the WHIMM, indicating that the two forms measure related but different constructs. Statistical tests of the construct validity of the WHIMM compared with the AUDIT and the DAST indicate that the WHIMM's subscales measure constructs separate from those measured by the AUDIT and DAST. Discussion and implications of these findings are discussed in greater detail in chapter five.

CHAPTER FIVE

DISCUSSION

The purpose of this study was to design and pilot an instrument that uses the Williams Hierarchical Integrated Model as a foundation for measuring needs met within and outside of substance use for individuals age 18 and older who report previously considering cutting down on alcohol or drug use. The scale development process allowed for initial validation of the WHIMM, including measurement of inter-item reliability, test-retest reliability, correlation between subscales, and construct validity. In addition, a scoring metric was developed to allow an individual's WHIMM results to be interpreted based upon the national normative sample used for the present study.

Reliability of the WHIMM

The overall WHIMM and each of the subscales for the Global and Substance Use forms yielded Cronbach's alpha inter-item reliability coefficients equal to or greater than .90. Inter-correlations among subscales demonstrated that subscales were related without containing redundant content, thus maximizing the universe of content sampled within the WHIMM overall. Test-retest reliability for the WHIMM Global and Substance Use forms was generally adequate, although several specific subscales fell slightly short of a minimum reliability of .70 and two subscales (Global Physiological Attainments and Substance Use Spiritual Deficiencies) yielded statistically significant results when the first and re-contact pilot data were compared using a paired-samples *t*-test.

One explanation for the poorer test-retest reliabilities of these two subscales includes the possibility that these two elements may be inconsistent over time for individuals who have a history of problematic substance use. Since the majority of participants reported they never received treatment for a substance use disorder, it is feasible to consider that their current use patterns may have impacted the stability of these two constructs even over the duration of the test-retest time span. Similarly, if individuals who participated in both the first and re-contact pilots elected to make changes to their substance use patterns following the first WHIMM pilot, it is also possible that these changes may have been reflected in the re-contact data.

Validity of the WHIMM

The convergent and discriminant validity tests of the WHIMM demonstrated that the constructs measured by the WHIMM differ substantially from the constructs measured by the AUDIT and DAST. Both the ADUIT and DAST overtly measure frequency, quantity, and consequences of alcohol and drug use, while the WHIMM measures needs met through and outside of substance use and self-efficacy related to meeting these needs in each domain. The discriminant validity demonstrated between these instruments is logical and supports the use of the WHIMM as a multidimensional measure that is not duplicating information collected through the use of these other instruments. Despite the anticipated finding of convergent validity between the AUDIT and the DAST and the WHIMM's Physiological Deficiencies and Attainments subscales, the observed results are logical given the multifaceted nature of each of these elements within the WHIMM when compared to the uni-dimensional focus on substance use within both the AUDIT and the DAST. As a result, the WHIMM may serve as a more

appropriate instrument for assessing the multidimensional elements impacting and impacted by problematic substance use than either the AUDIT or DAST based upon these findings.

Exploratory factor analysis loosely supported the Williams Hierarchical Integrated Model's discrete but interrelated elements, with the strongest support observed for the WHIMM's Need items. Because the integration of Maslow's hierarchy of needs is an essential element of the Williams Hierarchical Integrated Model, the EFA procedures also provided preliminary support for Maslow's hierarchy of needs as operationalized in the Williams Hierarchical Integrated Model. This support for the needs described within Maslow's hierarchy warrants future exploration and ongoing research; additional validation of Maslow's hierarchy may support its use as a framework with empirical support, a limitation inherent in the current use of Maslow's hierarchy due to its previous poor operationalization and validation.

While the EFA procedures conducted for the WHIMM's Self-Efficacy items did not produce four discrete factors for Biological, Psychological, Social, and Spiritual Self-Efficacy, these four factors were observed, albeit with dual-loaded items, for the Global Self-Efficacy items. While the Substance Use Self-Efficacy items yielded three distinct factors instead of four, it is possible that the nature of substance use and the consequences of use blur the lines between these discrete domains in ways that warrant future study. Overall, the self-efficacy factor structure observed through EFA loosely supports the Williams Hierarchical Integrated Model's description of these elements and also provides opportunities for future research and exploration.

Difference between WHIMM Global and WHIMM Substance Use Forms

The statistically-significant difference between scores on the WHIMM Global and WHIMM Substance Use forms justifies the existence of the two separate forms of the instrument and supports the belief that individuals who engage in problematic substance use have differential levels of functioning, self-efficacy, and need attainment within and outside of substance use. The differential impact of substance use on these areas of functioning and self-efficacy are captured by the WHIMM in a comprehensive and systematic way. As a result, the WHIMM represents a psychometrically sound, effective tool for assessing functioning based upon needs met within and outside of substance use as well as measuring an individual's self-efficacy to meet these needs across both global and substance use domains.

Implications

The WHIMM's psychometric adequacy makes the instrument a viable and informative tool for use by counselors, psychologists, and other individuals who work in the field of substance use disorder treatment. Because the model upon which the WHIMM is based is aligned with current evidence-based models for conceptualizing and intervening upon problematic substance use, the WHIMM is uniquely able to assess the multidimensional areas of functioning, needs met through and outside of substance use, and self-efficacy related to need attainment within the scope of a single unified instrument. As a result, it is possible that the WHIMM may serve as an effective alternative in place of a battery of assessments used to collect disparate data not included as a unified whole in the majority of substance use disorder assessments.

The stability of the WHIMM coupled with inter-item reliability coefficients greater than .90 make the WHIMM a useful tool for assessing baseline status and

progress in treatment. Data obtained from baseline administration of the WHIMM may help to inform areas of primary intervention; subsequent administrations may demonstrate treatment progress as well as highlight new areas that emerge as relevant to treatment. The psychometric properties of the WHIMM support its use as an evidence-based tool that can be used to make decisions related to problem identification and treatment while supporting a holistic focus on both needs and strengths of the individuals seeking treatment.

The EFA findings related to the WHIMM's variables loosely support the Williams Hierarchical Integrated Model as a model with empirical support. This model, as a stand-alone tool, may also prove effective in conceptualizing client strengths, needs, and self-efficacy based upon interviews, observations, and collateral information. Because the model attends to functioning, needs, and self-efficacy within and across domains, and also because the model balances a focus on both needs and strengths, the Williams Hierarchical Integrated Model may be considered a useful case-conceptualization tool for individuals working in substance use disorder treatment settings. While the general utility of this model with a non-substance using population was not the focus of the present study, it may be possible for the model to be used similarly to conceptualize the strengths and needs of individuals seeking mental health treatment for other concerns in addition to substance use disorders.

A major criticism of Maslow's hierarchy of needs lies in the varied and inconsistent empirical support for the model. Although Maslow's hierarchy was adapted and integrated into the Williams Hierarchical Integrated Model for the purpose of constructing the WHIMM, the EFA results generally support the constructs originally

described by Maslow and operationalized by the researcher of the present study. The WHIMM is psychometrically valid and was constructed with rigorous attention to developing items that sampled the universe of content for each domain in a systematic and clear way. As a result, consideration should also be given to the validity of Maslow's hierarchy as a model with empirical support stemming from the development of the WHIMM. While this represents a preliminary finding amenable to future study, initial results from the current study suggest that ongoing validation of Maslow's hierarchy via rigorous instrumentation and operational definition development may be a worthwhile pursuit.

Limitations

While the WHIMM instrument design, construction, and initial validation procedures were devised to produce a high-quality reliable and valid instrument, several limitations exist within the context of the present study. A primary limitation rests in the researcher's limited knowledge related to participant recruitment procedures. Because Qualtrics Panels was responsible for recruiting participants, specific incentives, venues for reaching participants, and motivations of the participants to complete the WHIMM pilot are unknown to the researcher. These factors may have influenced whether participants elected to participate and also may have impacted their responses to some items or the WHIMM as a whole.

In addition, the sample sizes of 200 for the first pilot, 50 for the re-contact, and 420 for the final pilot, while adequate for the purposes of the present study, would have benefited from being larger. Because the first pilot was used to reduce item counts, the re-contact was used to assess construct validity, and the final pilot combined with the first

pilot was used to compute reliability coefficients and conduct factor analysis, larger sample sizes in all domains would have strengthened the study. In particular, the 50-person re-contact may have yielded stronger correlations between the first and second testing with a larger sample size.

Additional limitations exist related to the population targeted in the present study. Substance use may impact cognition, judgement, and motivation to participate in a research study, which may have influenced individuals who did not participate. In addition, financial limitations may preclude those experiencing financial consequences related to substance use from accessing technology used to administer this assessment. In addition, the frequency of co-occurring mental health and substance use disorders among participants was not obtained during the present study; it is possible that some individuals impacted by both completed the instrument, the impact of which is unknown at present.

While online administration provided access to a national sample of participants, it limited the standardization of administration. Without standardization, specific circumstances under which participant completed the study—including interpretation of directions, attention to the task, and substance use while completing the study are not known.

Recommendations for Future Research

Future research should focus on three areas: ongoing validation and creation of a short form version of the WHIMM; application of the Williams Hierarchical Integrated Model to assessment and treatment of substance use disorders and other mental health disorders, and validation of Maslow's hierarchy of needs as an evidence-based model. The continued data collection to support refinement of the WHIMM and to aid in the

development of a short-form version of the instrument is an important next step in making the WHIMM useful for individuals who complete it and for those who administer it for service-provision purposes. A short-form version may help to eliminate items that are ineffective or that load poorly onto one sole factor and may also increase completion rate among individuals who are unable to attend to the longer form. Future research should also address developing demographic profiles and identifying normative results for specific sub-groups of the population including analysis of data by gender, race/ethnicity, educational level, geographic region, and treatment history. This will support assessment of the validity of the WHIMM for use with specific subgroups and may also allow for the development of specific profiles that may inform treatment planning and interventions.

In addition, the development of a WHIMM Global form validated on a representative general population sample will allow the instrument to be used with individuals seeking mental health care for concerns other than substance use. By developing the WHIMM Global form for use with the general population, its utility related to measuring functioning, needs met, and self-efficacy can be applied to individuals with a variety of presenting concerns. It will also support the use of the model underlying the WHIMM for conceptualization of client strengths and needs across areas of concern.

Applications of the Williams Hierarchical Integrated Model for treatment planning and intervention purposes are additional areas of future research. Specifically, determining the effectiveness of specific evidence-based treatment modalities for specific areas of need and strengths of the client may help refine the process of determining where

to begin treatment and how to intervene. Because the WHIMM measures functioning, needs met, and self-efficacy related to meeting needs, the connection of interventions to specific subscale domains is logical. For example, an individual with low self-efficacy to meet his or her needs may benefit from motivational interviewing interventions to support self-efficacy. If an individual is struggling to meet physiological needs, providing social service support coupled with psychoeducation related to community-based resources may be prudent. By assessing the effectiveness of specific treatments and interventions based upon an individual's strengths and needs, the WHIMM can be connected to specific evidence-based practices to maximize effectiveness of treatment.

Because the Williams Hierarchical Integrated Model may also be applicable for use with concerns outside of problematic substance use, it is prudent for research to explore the relationship between WHIMM Global profiles and treatment interventions that may be useful with individuals presenting with mental health or adjustment-related concerns. While it is possible that some interventions for substance use may parallel interventions for other presenting concerns, it is important to use a future WHIMM Global form and future obtained data on treatment effectiveness with a population other than individuals seeking substance use treatment in order to appropriately apply the model to these concerns for treatment planning and intervention purposes.

Finally, future research on the validity of Maslow's hierarchy of needs as a model for conceptualizing need pursuit and attainment should be undertaken in light of the empirical support for the model suggested during the WHIMM's initial validation process. While Maslow's hierarchy as he described it maintains a complexity beyond the scope of the Williams Hierarchical Integrated Model, attention to the empirical viability

of Maslow's model may support reinvigoration in this model's use in clinical practice settings and provide empirical support to justify using the model as a tool for assessment and treatment purposes.

Conclusion

The WHIMM represents a psychometrically sound instrument for assessing functioning, needs met through and outside of substance use, and self-efficacy to meet needs in each domain. Despite limitations related to third-party participant recruitment, online administration, and an adequate but relatively small sample size, the results of the current study suggest that the WHIMM is a reliable and valid tool for use with individuals engaging in problematic substance use. Future areas of study should focus on continuing to validate the WHIMM, creating a short form version of the WHIMM, and developing a Global form of the WHIMM for use with individuals not engaging in problematic substance use. Additional areas for future research include developing and assessing the impact of specific evidence-based treatment practices based upon WHIMM profiles, developing similar profiles for individuals seeking mental health treatment, and pursuing validation of Maslow's hierarchy as a viable model for conceptualization of need pursuit and attainment.

APPENDIX A: TEST BLUEPRINT

Global Questions		
Biological ← (20 items)	Physiological deficiencies 10 items	Self-efficacy (domain specific) 5 items
	Physiological attainments ← 10 items	Self-efficacy (domain specific) 5 items
Psycho-logical ← (20 items)	Safety needs 10 items	Self-efficacy (domain specific) 5 items
	Self-actualization needs ← 10 items	Self-efficacy (domain specific) 5 items
Social ← (20 items)	Belongingness needs 10 items	Self-efficacy (domain specific) 5 items
	Esteem needs ← 10 items	Self-efficacy (domain specific) 5 items
Spiritual ← (20 items)	Spiritual deficits 10 items	Self-efficacy (domain specific) 5 items
	Spiritual growth ← 10 items	Self-efficacy (domain specific) 5 items

Substance Use Questions		
Biological ← (20 items)	Physiological deficiencies 10 items	Self-efficacy (domain specific) 5 items
	Physiological attainments ← 10 items	Self-efficacy (domain specific) 5 items
Psycho-logical ← (20 items)	Safety needs 10 items	Self-efficacy (domain specific) 5 items
	Self-actualization needs ← 10 items	Self-efficacy (domain specific) 5 items
Social ← (20 items)	Belongingness needs 10 items	Self-efficacy (domain specific) 5 items
	Esteem needs ← 10 items	Self-efficacy (domain specific) 5 items
Spiritual ← (20 items)	Spiritual deficits 10 items	Self-efficacy (domain specific) 5 items
	Spiritual growth ← 10 items	Self-efficacy (domain specific) 5 items

Purpose: To develop an instrument to measure the Williams Hierarchical Integrated Model
Hypotheses:

- Factor analysis of data obtained following final instrument administration will yield distinct factors that support the Williams Hierarchical Integrated Model's discrete elements and overall framework
- The value of Cronbach's coefficient alpha for each item set for each observed factor will be greater than .80
- There are differences between an individual's response patterns to equivalent items when one item references substance use and the other references overall experience for individuals who are currently engaging in problematic substance use

Number of Subscales:

Two domains: Through substance use, outside of substance use

Six levels of Maslow's Hierarchy of Needs (subsumes growth/deficiency; feeds directly into BPSS)

Six levels of self-efficacy (one for each need category)

One level of deception scale (to be built into scales overall)

Number of Items: 240; 120 Global, 120 Substance Use

Subscales (hypothesized):

Through Substance use

Physiological (contributes to biological; subsumes deficiency)

Safety (contributes to psychological; subsumes deficiency)

Belongingness (contributes to social; subsumes deficiency)

Esteem (contributes to social; subsumes growth)

Self-actualization (contributes to psychological; subsumes growth)

Self-transcendence (contributes to spiritual; subsumes growth)

Outside of Substance use

Physiological (contributes to biological; subsumes deficiency)

Physiological self-efficacy

Safety (contributes to psychological; subsumes deficiency)

Safety self-efficacy

Belongingness (contributes to social; subsumes deficiency)

Belongingness self-efficacy

Esteem (contributes to social; subsumes growth)

Esteem self-efficacy

Self-actualization (contributes to psychological; subsumes growth)

Self-actualization self-efficacy

Self-transcendence (contributes to spiritual; subsumes growth)

Self-transcendence self-efficacy

Overall deception scale split between the two domains (through/outside of use)

***Note: Items will be equivalent except for the phrase ‘through substance use’ or ‘outside of substance use’ (or a comparable phrase) for items in each domain

Item Type: Likert Scales, 6-point

Administration and Face Validity Considerations:

- Online administration

- Explain purpose of study and obtain informed consent through online administration
- Provide personalized feedback as output after administration
- Qualify clearly that this is not medical advice

Construct: Williams Hierarchical Integrated Model

Theoretical Orientation: Post-Positivist

Number of Domains: Two

Through substance use

Outside of substance use

Functioning: Four

Biological

Psychological

Social

Spiritual

Drive: Six

Physiological

Safety

Belongingness

Esteem

Self-Actualization

Self-Transcendence

Drive: Two categories

Growth

Deficiency

Self-Efficacy: Four sources

Personal experience

Vicarious experience

Persuasion

Physiological states

(These will be addressed separately for each need domain above)

Social desirability: TBD

Control for social desirability using paired items, always/never, or other techniques TBD

Scoring:

Subscales in each Need Domain for both global and substance use fields scored; higher scores indicate greater number of needs met in the domain

Subscales produced by subtracting substance use question subscores from global subscores; positive scores indicate need is met outside of substance use more than by it, negative scores indicate need is met more through substance use than outside of it

Self-efficacy subscales-determines the degree to which individuals believe they can meet needs in each domain. Higher score=greater self-efficacy to meet needs.

BPSS subscales: identify current functioning in each sub-domain. Higher score=more successful functioning in each domain.

Test Directions: TBD based on administration and IRB

Demographic Information to be collected:

Gender

Age (banded)

Race/Ethnicity

Geographic location (region)

Previous history of treatment (Y/N)

Cost: TBD (Seeking NIH/NIDA Grant to support data collection)

Timeframe:

May 2015-Apply for grant; develop item bank

June 2015-Create pilot instrument; distribute

July 2015-second mailing if needed

August 2015-Analyze pilot data; create final instrument

September 2015-develop web site for administration

September 2015-December 2015-collect data

January 2016-Data analysis

March 2016-Final draft of dissertation completed

Analysis of Data: EFA with PAF/ULS and oblique rotation

Target Sample: 200 (pilot); 1,500 (administration)

Method of Recruitment:

Pilot: online through professional contacts/organizations who can provide link to potential participants and/or paid participant survey service

Final: online through website intended for this purpose

APPENDIX B: WHIMM SCREENING ITEMS AND DEMOGRAPHIC

QUESTIONS

I acknowledge that I am age 18 or older and I agree to participate in this research study described in the informed consent document above. (yes/no-screened out if 'no' response is selected)

I have thought about cutting down on my alcohol and/or drug use at some point in my life. (yes/no-screened out if 'no' response is selected)

What is your gender?

What is your age?

What is your ethnicity?

What is your race?

In what region of the United States do you currently live?

What is your highest level of education?

Have you ever received treatment for any substance use-related issue or concern?

APPENDIX C: WHIMM PILOT ONE ITEMS

The following items are rated on the following scale: Strongly disagree/Disagree/Slightly disagree/Slightly agree/Agree/Strongly agree

I often feel tired.

I get sick easily.

I am physically unable to drive.

I am often in physical pain.

I need help to shower or bathe.

I do not eat enough.

I use support (e.g., cane, walker) to get around.

I often have a headache.

I eat too much.

I seldom have access to clean water.

I sleep too much.

I have problems with my teeth.

I seldom go to the doctor when I am sick.

I feel unwell due to a chronic medical condition (e.g., high blood pressure, asthma, heart disease, hepatitis, HIV/AIDS).

I sometimes cannot afford to buy food.

I bruise easily.

I sometimes have unprotected sex.

I sometimes cannot afford to buy clothing.

I often have stomach pain.

I sometimes trip, fall, or lose my balance.

It takes a long time for my cuts and scrapes to heal.

My stomach gets upset easily.

I sometimes put myself at risk of getting an STD.

I have difficulty falling asleep.

I feel unwell due to a chronic mental health condition (e.g., depression, bipolar disorder, schizophrenia, anxiety).

I eat at regular times during the day.

I go to the doctor when I am sick.

I feel rested when I wake each morning.

I feel physically healthy.

I go to the doctor regularly.

I rarely have accidents (e.g., falling, tripping, bumping into things) in my home.

I eat fruits and vegetables regularly.

I rarely get sick.

I go to the dentist regularly.

I follow directions exactly when I take medications.

I am rarely in physical pain.

I exercise regularly.

I wake up about the same time each day.

I am physically able to do household chores.

I regularly spend time outside.

I am at a healthy weight.

I go to bed about the same time every day.

I am physically able to move around my house without help.

My weight has been stable this past year.

I follow the directions doctors give me.

I rarely go to the emergency room due to illness or injury.

I take time off work when I am sick.

I avoid cigarette smoke.

I get vaccinated regularly.

I stay hydrated.

I sometimes cannot afford to heat my home.

I feel unsafe in my home.

I sometimes cannot afford to cool my home.

I feel stressed.

I feel unsafe in my neighborhood.

I sometimes cannot afford to pay my electric bill.

My life feels out of control.

I worry about being physically abused.

I feel unsafe when I am alone.

I worry I might become a victim of crime in my neighborhood.

I cannot afford to pay my rent or mortgage.

I dread leaving my home.

I do not have a regular daily routine.

I feel afraid.

I worry about being emotionally abused.

I seldom get paid on a regular basis.

I feel anxious.

I am sometimes in situations where I feel unsafe.

I worry about being sexually abused.

I feel sad.

I do not trust most people.

I seldom live in one place for very long.

I worry about how I will pay my bills.

I worry about being affected by a natural disaster (e.g., hurricane, earthquake, tornado, flood).

I do not have reliable transportation.

I feel happy.

I enjoy my job.

I know what I am good at.

I have hobbies I enjoy.

I am responsible.

I try to improve my skills.

I ask for help when I need it.

I learn from my mistakes.

I try to make the best of bad situations.

I do not give up easily.

I work hard to achieve my goals.

I keep promises I make to others.

I am content with my life.

I feel useful.

I am proud of myself.

I keep promises I make to myself.

I regularly set goals for myself.

I am honest with others.

I make a positive difference in others' lives.

I cope with stress in healthy ways.

I rebound from setbacks.

I easily adapt to change.

Others respect me.

I practice things that are hard for me until I improve.

I like myself.

I am lonely.

It is hard for me to make friends.

I keep to myself too much.

People often hurt my feelings.

My family does not understand me.

I do not have enough friends.

I avoid getting close to others.

Most people do not understand me.

It is hard for me to keep friends.

I am too careful about who I get close to.

I do not reach out to others when I am in need of help.

I have little contact with my family.

I regularly cancel plans I make with others.

My romantic relationships do not last very long.

I feel judged by others.

I do not fit in with my friends.

I spend too much time alone.

I avoid pursuing romantic relationships.

I do not fit in with my family.

I do not like being affectionate.

My friendships do not last very long.

I keep to myself at work.

I avoid showing affection to others.

I seldom speak with my friends.

I do not know who I would call if I had an emergency.

I feel valued at my job.

My friends think I am considerate.

I have at least one person with whom I share good news.

I contribute to my family financially.

I feel valued by my friends.

I make a positive difference in others' lives.

My co-workers think I am a hard worker.

I feel valued by my family.

I am proud of my reputation at work.

I do not like to let people down.

I can name several things I am good at.

I feel valued in my romantic relationships.

I rarely let people down.

I am proud of my reputation with friends.

I tell others I am proud of them.

I do some things better than other people.

My family is proud of me.

My co-workers respect me.

I feel proud of myself when I succeed at challenging tasks.

I feel appreciated by others.

My family respects me.

My friends are proud of me.

I get praise from others when I do something well.

I feel valued at my job.

My friends think I am considerate.

My life feels meaningless.

I feel uncomfortable at events that include spiritual components.

I do not believe in a higher power.

I avoid thinking about the purpose of my life.

I believe spirituality will hurt more than it will help.

I feel defeated.

I am angry at a higher power.

I often blame a higher power for my problems.

I believe my life has no purpose.

I avoid activities that involve spiritual components.

My life feels chaotic.

I am afraid to explore spirituality.

Sometimes I feel like a bad person.

I feel betrayed by a higher power.

I continue to focus on past mistakes.

I have difficulty forgiving myself.

I have no reason to believe in a higher power.

I rarely feel at peace.

I have been disappointed when I asked a higher power for help.

My values are not in line with my spiritual practices.

Being spiritual does not help me.

I feel abandoned by a higher power.

I do not see the point of spirituality.

My values are opposed to connecting with something greater than myself (e.g., nature, spirituality, religion).

I feel disconnected from anything outside of myself.

Spirituality is important to me.

I participate in spiritual practices with my family.

I take time to enjoy nature.

I feel connected to something greater than myself.

I pray regularly.

I make time for spirituality in my life.

My life has a purpose.

Feeling connected to something greater than myself (e.g., nature, spirituality, religion) is important to me.

I participate in spiritual practices with my friends.

I meditate regularly.

I cope with challenges by having faith things will get better.

I pay attention to my intuition.

I participate in spiritual practices alone.

I help others who have less than I do.

I tend to trust my intuition.

I usually remember my dreams upon awakening.

I have had an experience that increased my spiritual beliefs.

I believe everything happens for a reason.

I think about what my dreams might mean.

I have had an experience that can only be explained by faith.

I still feel connected to loved ones who are no longer living.

My spirituality gives me hope.

I have experienced a miracle.

I am trying to grow spiritually.

My belief in something greater than myself gives me hope.

I am willing and able to schedule a doctor's appointment when I am sick.

I am willing and able to drive myself to work/school.

I am willing and able to complete household chores.

I am willing and able to follow directions for the medicines I take.

I am willing and able to take care of myself when I am sick.

I am willing and able to shower or bathe by myself regularly.

I am willing and able to maintain a regular sleep schedule.

I am willing and able to follow directions doctors give me exactly.

I am willing and able to get around my house without support.

I am willing and able to brush my teeth daily.

I am willing and able to get out of bed daily.

I am willing and able to drink 6-8 glasses of water daily.

I am willing and able to eat three meals a day.

I am willing and able to eat fruits and vegetables regularly.

I am willing and able to go to bed at about the same time every day.

I am willing and able to exercise regularly.

I am willing and able to take care of myself when I am sick.

I am willing and able to wake up at about the same time every day.

I am willing and able to go to the dentist regularly.

I am willing and able to eat a healthy diet.

I am willing and able to see a doctor regularly.

I am willing and able to manage my weight.

I am willing and able to care for minor injuries (e.g., cuts, scrapes).

I am willing and able to protect myself from sexually transmitted diseases.

I am willing and able to feel safe in my home.

I am willing and able to cope with stress.

I am willing and able to avoid unsafe situations.

I am willing and able to maintain a daily routine.

I am willing and able to feel safe in my neighborhood.

I am willing and able to cope with anxiety.

I am willing and able to manage uncomfortable feelings.

I am willing and able to pay my rent or mortgage on time.

I am willing and able to let others know where I am going when I leave home.

I am willing and able to pay my electricity bill on time.

I am willing and able to make a phone call for help in an emergency.

I am willing and able to pay my other bills on time.

I am willing and able to set goals for myself.

I am willing and able to rebound from a setback (e.g., losing a job).

I am willing and able to feel good about my skills.

I am willing and able to follow through on goals I set for myself.

I am willing and able to practice things that are difficult until I improve.

I am willing and able to pursue hobbies I enjoy.

I am willing and able to obtain a job I find meaningful.

I am willing and able to keep promises I make to others.

I am willing and able to learn from my mistakes.

I am willing and able to ask for help when I have difficulty doing something.

I am willing and able to take pride in things I work hard at.

I am willing and able to keep promises I make to myself.

I am willing and able to reach out to someone when I feel lonely.

I am willing and able to make friends at work.

I am willing and able to keep plans I make.

I am willing and able to stay in touch with friends.

I am willing and able to make friends outside of work.

I am willing and able to stay in touch with family.

I am willing and able to put effort into my relationships.

I am willing and able to talk to my friends about my feelings.

I am willing and able to initiate a hug with a friend or family member.

I am willing and able to talk to my family about my feelings.

I am willing and able to plan a social activity with my friends.

I am willing and able to communicate my feelings to others.

I am willing and able to accomplish something at work I am proud of.

I am willing and able to share something I am proud of with friends or family.

I am willing and able to name at least three things I am good at.

I am willing and able to accomplish something outside of work I am proud of.

I am willing and able to name at least three things I am trying to improve.

I am willing and able to feel proud of myself.

I am willing and able to do something kind for another person.

I am willing and able to contribute to running my household.

I am willing and able to accept praise from others.

I am willing and able to contribute to making my workplace run smoothly.

I am willing and able to tell someone when I am proud of him or her.

I am willing and able to follow through when I tell someone I am going to do something.

I am willing and able to find meaning in my life.

I am willing and able to cope with feelings of anger toward a higher power.

I am willing and able to think about the purpose of my life.

I am willing and able to identify my role in challenges I face in life.

I am willing and able to find healthy ways to manage feelings of defeat.

I am willing and able to forgive others for past mistakes.

I am willing and able to feel at peace.

I am willing and able to forgive myself for past mistakes.

I am willing and able to believe in something greater than myself (e.g., nature, spirituality, religion).

I am willing and able to make time for my own spiritual practice.

I am willing and able to explore what spirituality means to me.

I am willing and able to connect with other people through spiritual practices.

I am willing and able to participate in spiritual practices.

I am willing and able to make time for self-reflection.

I am willing and able to believe in something greater than myself (e.g., nature, spirituality, religion).

I am willing and able to remember my dreams upon awakening.

I am willing and able to find purpose in my hardships.

I am willing and able to better understand my dreams.

I am willing and able to help others who have less than I do.

I am willing and able to continue growing spiritually.

I am willing and able to trust my intuition when making an important decision.

I am willing and able to show kindness to people with whom I do not get along.

I am willing and able to find hope through spiritual practices.

I am willing and able to make time to connect with something greater than myself (e.g., nature, spirituality, religion).

I often feel tired when I use alcohol or drugs.

I get sick easily when I use alcohol or drugs.

I am physically unable to drive when I use alcohol or drugs.

I am often in physical pain when I use alcohol or drugs.

I need help to shower or bathe when I use alcohol or drugs.

I do not eat enough when I use alcohol or drugs.

I use support (e.g., cane, walker) to get around when I use alcohol or drugs.

I often have a headache when I use alcohol or drugs.

I eat too much when I use alcohol or drugs.

I seldom have access to clean water when I use alcohol or drugs.

I sleep too much when I use alcohol or drugs.

I have problems with my teeth when I use alcohol or drugs.

I seldom go to the doctor when I am sick when I use alcohol or drugs.

I feel unwell due to a chronic medical condition (e.g., high blood pressure, asthma, heart disease, hepatitis, HIV/AIDS) when I use alcohol or drugs.

I sometimes cannot afford to buy food when I use alcohol or drugs.

I bruise easily when I use alcohol or drugs.

I sometimes have unprotected sex when I use alcohol or drugs.

I sometimes cannot afford to buy clothing when I use alcohol or drugs.

I often have stomach pain when I use alcohol or drugs.

I sometimes trip, fall, or lose my balance when I use alcohol or drugs.

It takes a long time for my cuts and scrapes to heal when I use alcohol or drugs.

My stomach gets upset easily when I use alcohol or drugs.

I sometimes put myself at risk of getting an STD when I use alcohol or drugs.

I have difficulty falling asleep when I use alcohol or drugs.

I feel unwell due to a chronic mental health condition (e.g., depression, bipolar disorder, schizophrenia, anxiety) when I use alcohol or drugs.

I eat at regular times during the day when I use alcohol or drugs.

I go to the doctor when I am sick when I use alcohol or drugs.

I feel rested when I wake each morning when I use alcohol or drugs.

I feel physically healthy when I use alcohol or drugs.

I go to the doctor regularly when I use alcohol or drugs.

I rarely have accidents (e.g., falling, tripping, bumping into things) in my home when I use alcohol or drugs.

I eat fruits and vegetables regularly when I use alcohol or drugs.

I rarely get sick when I use alcohol or drugs.

I go to the dentist regularly when I use alcohol or drugs.

I follow directions exactly when I take medications when I use alcohol or drugs.

I am rarely in physical pain when I use alcohol or drugs.

I exercise regularly when I use alcohol or drugs.

I wake up about the same time each day when I use alcohol or drugs.

I am physically able to do household chores when I use alcohol or drugs.

I regularly spend time outside when I use alcohol or drugs.

I am at a healthy weight when I use alcohol or drugs.

I go to bed about the same time every day when I use alcohol or drugs.

I am physically able to move around my house without help when I use alcohol or drugs.

My weight has been stable this past year when I use alcohol or drugs.

I follow the directions doctors give me when I use alcohol or drugs.

I rarely go to the emergency room due to illness or injury when I use alcohol or drugs.

I take time off work when I am sick when I use alcohol or drugs.

I avoid cigarette smoke when I use alcohol or drugs.

I get vaccinated regularly when I use alcohol or drugs.

I stay hydrated when I use alcohol or drugs.

I sometimes cannot afford to heat my home when I use alcohol or drugs.

I feel unsafe in my home when I use alcohol or drugs.

I sometimes cannot afford to cool my home when I use alcohol or drugs.

I feel stressed when I use alcohol or drugs.

I feel unsafe in my neighborhood when I use alcohol or drugs.

I sometimes cannot afford to pay my electric bill when I use alcohol or drugs.

My life feels out of control when I use alcohol or drugs.

I worry about being physically abused when I use alcohol or drugs.

I feel unsafe when I am alone when I use alcohol or drugs.

I worry I might become a victim of crime in my neighborhood when I use alcohol or drugs.

I cannot afford to pay my rent or mortgage when I use alcohol or drugs.

I dread leaving my home when I use alcohol or drugs.

I do not have a regular daily routine when I use alcohol or drugs.

I feel afraid when I use alcohol or drugs.

I worry about being emotionally abused when I use alcohol or drugs.

I seldom get paid on a regular basis when I use alcohol or drugs.

I feel anxious when I use alcohol or drugs.

I am sometimes in situations where I feel unsafe when I use alcohol or drugs.

I worry about being sexually abused when I use alcohol or drugs.

I feel sad when I use alcohol or drugs.

I do not trust most people when I use alcohol or drugs.

I seldom live in one place for very long when I use alcohol or drugs.

I worry about how I will pay my bills when I use alcohol or drugs.

I worry about being affected by a natural disaster (e.g., hurricane, earthquake, tornado, flood) when I use alcohol or drugs.

I do not have reliable transportation when I use alcohol or drugs.

I feel happy when I use alcohol or drugs.

I enjoy my job when I use alcohol or drugs.

I know what I am good at when I use alcohol or drugs.

I have hobbies I enjoy when I use alcohol or drugs.

I am responsible when I use alcohol or drugs.

I try to improve my skills when I use alcohol or drugs.

I ask for help when I need it when I use alcohol or drugs.

I learn from my mistakes when I use alcohol or drugs.

I try to make the best of bad situations when I use alcohol or drugs.

I do not give up easily when I use alcohol or drugs.

I work hard to achieve my goals when I use alcohol or drugs.

I keep promises I make to others when I use alcohol or drugs.

I am content with my life when I use alcohol or drugs.

I feel useful when I use alcohol or drugs.

I am proud of myself when I use alcohol or drugs.

I keep promises I make to myself when I use alcohol or drugs.

I regularly set goals for myself when I use alcohol or drugs.

I am honest with others when I use alcohol or drugs.

I make a positive difference in others' lives when I use alcohol or drugs.

I cope with stress in healthy ways when I use alcohol or drugs.

I rebound from setbacks when I use alcohol or drugs.

I easily adapt to change when I use alcohol or drugs.

Others respect me when I use alcohol or drugs.

I practice things that are hard for me until I improve when I use alcohol or drugs.

I like myself when I use alcohol or drugs.

I am lonely when I use alcohol or drugs.

It is hard for me to make friends when I use alcohol or drugs.

I keep to myself too much when I use alcohol or drugs.

People often hurt my feelings when I use alcohol or drugs.

My family does not understand me when I use alcohol or drugs.

I do not have enough friends when I use alcohol or drugs.

I avoid getting close to others when I use alcohol or drugs.

Most people do not understand me when I use alcohol or drugs.

It is hard for me to keep friends when I use alcohol or drugs.

I am too careful about who I get close to when I use alcohol or drugs.

I do not reach out to others when I am in need of help when I use alcohol or drugs.

I have little contact with my family when I use alcohol or drugs.

I regularly cancel plans I make with others when I use alcohol or drugs.

My romantic relationships do not last very long when I use alcohol or drugs.

I feel judged by others when I use alcohol or drugs.

I do not fit in with my friends when I use alcohol or drugs.

I spend too much time alone when I use alcohol or drugs.

I avoid pursuing romantic relationships when I use alcohol or drugs.

I do not fit in with my family when I use alcohol or drugs.

I do not like being affectionate when I use alcohol or drugs.

My friendships do not last very long when I use alcohol or drugs.

I keep to myself at work when I use alcohol or drugs.

I avoid showing affection to others when I use alcohol or drugs.

I seldom speak with my friends when I use alcohol or drugs.

I do not know who I would call if I had an emergency when I use alcohol or drugs.

I feel valued at my job when I use alcohol or drugs.

My friends think I am considerate when I use alcohol or drugs.

I have at least one person with whom I share good news when I use alcohol or drugs.

I contribute to my family financially when I use alcohol or drugs.

I feel valued by my friends when I use alcohol or drugs.

I make a positive difference in others' lives when I use alcohol or drugs.

My co-workers think I am a hard worker when I use alcohol or drugs.

I feel valued by my family when I use alcohol or drugs.

I am proud of my reputation at work when I use alcohol or drugs.

I do not like to let people down when I use alcohol or drugs.

I can name several things I am good at when I use alcohol or drugs.

I feel valued in my romantic relationships when I use alcohol or drugs.

I rarely let people down when I use alcohol or drugs.

I am proud of my reputation with friends when I use alcohol or drugs.

I tell others I am proud of them when I use alcohol or drugs.

I do some things better than other people when I use alcohol or drugs.

My family is proud of me when I use alcohol or drugs.

My co-workers respect me when I use alcohol or drugs.

I feel proud of myself when I succeed at challenging tasks when I use alcohol or drugs.

I feel appreciated by others when I use alcohol or drugs.

My family respects me when I use alcohol or drugs.

My friends are proud of me when I use alcohol or drugs.

I get praise from others when I do something well when I use alcohol or drugs.

I feel valued at my job when I use alcohol or drugs.

My friends think I am considerate when I use alcohol or drugs.

My life feels meaningless when I use alcohol or drugs.

I feel uncomfortable at events that include spiritual components when I use alcohol or drugs.

I do not believe in a higher power when I use alcohol or drugs.

I avoid thinking about the purpose of my life when I use alcohol or drugs.

I believe spirituality will hurt more than it will help when I use alcohol or drugs.

I feel defeated when I use alcohol or drugs.

I am angry at a higher power when I use alcohol or drugs.

I often blame a higher power for my problems when I use alcohol or drugs.

I believe my life has no purpose when I use alcohol or drugs.

I avoid activities that involve spiritual components when I use alcohol or drugs.

My life feels chaotic when I use alcohol or drugs.

I am afraid to explore spirituality when I use alcohol or drugs.

Sometimes I feel like a bad person when I use alcohol or drugs.

I feel betrayed by a higher power when I use alcohol or drugs.

I continue to focus on past mistakes when I use alcohol or drugs.

I have difficulty forgiving myself when I use alcohol or drugs.

I have no reason to believe in a higher power when I use alcohol or drugs.

I rarely feel at peace when I use alcohol or drugs.

I have been disappointed when I asked a higher power for help when I use alcohol or drugs.

My values are not in line with my spiritual practices when I use alcohol or drugs.

Being spiritual does not help me when I use alcohol or drugs.

I feel abandoned by a higher power when I use alcohol or drugs.

I do not see the point of spirituality when I use alcohol or drugs.

My values are opposed to connecting with something greater than myself (e.g., nature, spirituality, religion) when I use alcohol or drugs.

I feel disconnected from anything outside of myself when I use alcohol or drugs.

Spirituality is important to me when I use alcohol or drugs.

I participate in spiritual practices with my family when I use alcohol or drugs.

I take time to enjoy nature when I use alcohol or drugs.

I feel connected to something greater than myself when I use alcohol or drugs.

I pray regularly when I use alcohol or drugs.

I make time for spirituality in my life when I use alcohol or drugs.

My life has a purpose when I use alcohol or drugs.

Feeling connected to something greater than myself (e.g., nature, spirituality, religion) is important to me when I use alcohol or drugs.

I participate in spiritual practices with my friends when I use alcohol or drugs.

I meditate regularly when I use alcohol or drugs.

I cope with challenges by having faith things will get better when I use alcohol or drugs.

I pay attention to my intuition when I use alcohol or drugs.

I participate in spiritual practices alone when I use alcohol or drugs.

I help others who have less than I do when I use alcohol or drugs.

I tend to trust my intuition when I use alcohol or drugs.

I usually remember my dreams upon awakening when I use alcohol or drugs.

I have had an experience that increased my spiritual beliefs when I use alcohol or drugs.

I believe everything happens for a reason when I use alcohol or drugs.

I think about what my dreams might mean when I use alcohol or drugs.

I have had an experience that can only be explained by faith when I use alcohol or drugs.

I still feel connected to loved ones who are no longer living when I use alcohol or drugs.

My spirituality gives me hope when I use alcohol or drugs.

I have experienced a miracle when I use alcohol or drugs.

I am trying to grow spiritually when I use alcohol or drugs.

My belief in something greater than myself gives me hope when I use alcohol or drugs.

I am willing and able to schedule a doctor's appointment when I am sick when I use alcohol or drugs.

I am willing and able to drive myself to work/school when I use alcohol or drugs.

I am willing and able to complete household chores when I use alcohol or drugs.

I am willing and able to follow directions for the medicines I take when I use alcohol or drugs.

I am willing and able to take care of myself when I am sick when I use alcohol or drugs.

I am willing and able to shower or bathe by myself regularly when I use alcohol or drugs.

I am willing and able to maintain a regular sleep schedule when I use alcohol or drugs.

I am willing and able to follow directions doctors give me exactly when I use alcohol or drugs.

I am willing and able to get around my house without support when I use alcohol or drugs.

I am willing and able to brush my teeth daily when I use alcohol or drugs.

I am willing and able to get out of bed daily when I use alcohol or drugs.

I am willing and able to drink 6-8 glasses of water daily when I use alcohol or drugs.

I am willing and able to eat three meals a day when I use alcohol or drugs.

I am willing and able to eat fruits and vegetables regularly when I use alcohol or drugs.

I am willing and able to go to bed at about the same time every day when I use alcohol or drugs.

I am willing and able to exercise regularly when I use alcohol or drugs.

I am willing and able to take care of myself when I am sick when I use alcohol or drugs.

I am willing and able to wake up at about the same time every day when I use alcohol or drugs.

I am willing and able to go to the dentist regularly when I use alcohol or drugs.

I am willing and able to eat a healthy diet when I use alcohol or drugs.

I am willing and able to see a doctor regularly when I use alcohol or drugs.

I am willing and able to manage my weight when I use alcohol or drugs.

I am willing and able to care for minor injuries (e.g., cuts, scrapes) when I use alcohol or drugs.

I am willing and able to protect myself from sexually transmitted diseases when I use alcohol or drugs.

I am willing and able to feel safe in my home when I use alcohol or drugs.

I am willing and able to cope with stress when I use alcohol or drugs.

I am willing and able to avoid unsafe situations when I use alcohol or drugs.

I am willing and able to maintain a daily routine when I use alcohol or drugs.

I am willing and able to feel safe in my neighborhood when I use alcohol or drugs.

I am willing and able to cope with anxiety when I use alcohol or drugs.

I am willing and able to manage uncomfortable feelings when I use alcohol or drugs.

I am willing and able to pay my rent or mortgage on time when I use alcohol or drugs.

I am willing and able to let others know where I am going when I leave home when I use alcohol or drugs.

I am willing and able to pay my electricity bill on time when I use alcohol or drugs.

I am willing and able to make a phone call for help in an emergency when I use alcohol or drugs.

I am willing and able to pay my other bills on time when I use alcohol or drugs.

I am willing and able to set goals for myself when I use alcohol or drugs.

I am willing and able to rebound from a setback (e.g., losing a job) when I use alcohol or drugs.

I am willing and able to feel good about my skills when I use alcohol or drugs.

I am willing and able to follow through on goals I set for myself when I use alcohol or drugs.

I am willing and able to practice things that are difficult until I improve when I use alcohol or drugs.

I am willing and able to pursue hobbies I enjoy when I use alcohol or drugs.

I am willing and able to obtain a job I find meaningful when I use alcohol or drugs.

I am willing and able to keep promises I make to others when I use alcohol or drugs.

I am willing and able to learn from my mistakes when I use alcohol or drugs.

I am willing and able to ask for help when I have difficulty doing something when I use alcohol or drugs.

I am willing and able to take pride in things I work hard at when I use alcohol or drugs.

I am willing and able to keep promises I make to myself when I use alcohol or drugs.

I am willing and able to reach out to someone when I feel lonely when I use alcohol or drugs.

I am willing and able to make friends at work when I use alcohol or drugs.

I am willing and able to keep plans I make when I use alcohol or drugs.

I am willing and able to stay in touch with friends when I use alcohol or drugs.

I am willing and able to make friends outside of work when I use alcohol or drugs.

I am willing and able to stay in touch with family when I use alcohol or drugs.

I am willing and able to put effort into my relationships when I use alcohol or drugs.

I am willing and able to talk to my friends about my feelings when I use alcohol or drugs.

I am willing and able to initiate a hug with a friend or family member when I use alcohol or drugs.

I am willing and able to talk to my family about my feelings when I use alcohol or drugs.

I am willing and able to plan a social activity with my friends when I use alcohol or drugs.

I am willing and able to communicate my feelings to others when I use alcohol or drugs.

I am willing and able to accomplish something at work I am proud of when I use alcohol or drugs.

I am willing and able to share something I am proud of with friends or family when I use alcohol or drugs.

I am willing and able to name at least three things I am good at when I use alcohol or drugs.

I am willing and able to accomplish something outside of work I am proud of when I use alcohol or drugs.

I am willing and able to name at least three things I am trying to improve when I use alcohol or drugs.

I am willing and able to feel proud of myself when I use alcohol or drugs.

I am willing and able to do something kind for another person when I use alcohol or drugs.

I am willing and able to contribute to running my household when I use alcohol or drugs.

I am willing and able to accept praise from others when I use alcohol or drugs.

I am willing and able to contribute to making my workplace run smoothly when I use alcohol or drugs.

I am willing and able to tell someone when I am proud of him or her when I use alcohol or drugs.

I am willing and able to follow through when I tell someone I am going to do something when I use alcohol or drugs.

I am willing and able to find meaning in my life when I use alcohol or drugs.

I am willing and able to cope with feelings of anger toward a higher power when I use alcohol or drugs.

I am willing and able to think about the purpose of my life when I use alcohol or drugs.

I am willing and able to identify my role in challenges I face in life when I use alcohol or drugs.

I am willing and able to find healthy ways to manage feelings of defeat when I use alcohol or drugs.

I am willing and able to forgive others for past mistakes when I use alcohol or drugs.

I am willing and able to feel at peace when I use alcohol or drugs.

I am willing and able to forgive myself for past mistakes when I use alcohol or drugs.

I am willing and able to believe in something greater than myself (e.g., nature, spirituality, religion) when I use alcohol or drugs.

I am willing and able to make time for my own spiritual practice when I use alcohol or drugs.

I am willing and able to explore what spirituality means to me when I use alcohol or drugs.

I am willing and able to connect with other people through spiritual practices when I use alcohol or drugs.

I am willing and able to participate in spiritual practices when I use alcohol or drugs.

I am willing and able to make time for self-reflection when I use alcohol or drugs.

I am willing and able to believe in something greater than myself (e.g., nature, spirituality, religion) when I use alcohol or drugs.

I am willing and able to remember my dreams upon awakening when I use alcohol or drugs.

I am willing and able to find purpose in my hardships when I use alcohol or drugs.

I am willing and able to better understand my dreams when I use alcohol or drugs.

I am willing and able to help others who have less than I do when I use alcohol or drugs.

I am willing and able to continue growing spiritually when I use alcohol or drugs.

I am willing and able to trust my intuition when making an important decision when I use alcohol or drugs.

I am willing and able to show kindness to people with whom I do not get along when I use alcohol or drugs.

I am willing and able to find hope through spiritual practices when I use alcohol or drugs.

I am willing and able to make time to connect with something greater than myself (e.g., nature, spirituality, religion) when I use alcohol or drugs.

APPENDIX D: WHIMM PILOT ONE RECONTACT ITEMS

The following items are rated on the following scale: Strongly disagree/Disagree/Slightly disagree/Slightly agree/Agree/Strongly agree

I often feel tired.

I get sick easily.

I am physically unable to drive.

I do not eat enough.

I need help to shower or bathe.

I often have a headache.

I seldom have access to clean water.

I sleep too much.

I sometimes cannot afford to buy food.

I sometimes cannot afford to buy clothing.

I often have stomach pain.

I sometimes trip, fall, or lose my balance.

It takes a long time for my cuts and scrapes to heal.

My stomach gets upset easily.

I sometimes put myself at risk of getting an STD.

I eat at regular times during the day.

I feel rested when I wake each morning.

I feel physically healthy.

I eat fruits and vegetables regularly.

I rarely get sick.

I follow directions exactly when I take medications.

I am rarely in physical pain.

I exercise regularly.

I wake up about the same time each day.

I am physically able to do household chores.

I regularly spend time outside.

I go to bed about the same time every day.

I am physically able to move around my house without help.

My weight has been stable this past year.

I follow the directions doctors give me.

I sometimes cannot afford to heat my home.

I feel unsafe in my home.

I sometimes cannot afford to cool my home.

I feel unsafe in my neighborhood.

I sometimes cannot afford to pay my electric bill.

My life feels out of control.

I worry about being physically abused.

I feel unsafe when I am alone.

I worry I might become a victim of crime in my neighborhood.

I cannot afford to pay my rent or mortgage.

I feel afraid.

I worry about being emotionally abused.

I am sometimes in situations where I feel unsafe.

I worry about being sexually abused.

I worry about how I will pay my bills.

I know what I am good at.

I am responsible.

I try to improve my skills.

I ask for help when I need it.

I learn from my mistakes.

I try to make the best of bad situations.

I do not give up easily.

I work hard to achieve my goals.

I keep promises I make to others.

I keep promises I make to myself.

I am honest with others.

I make a positive difference in others' lives.

I rebound from setbacks.

I easily adapt to change.

I practice things that are hard for me until I improve.

It is hard for me to make friends.

I keep to myself too much.

I do not have enough friends.

I avoid getting close to others.

Most people do not understand me.

It is hard for me to keep friends.

I am too careful about who I get close to.

I feel judged by others.

I do not fit in with my friends.

I do not fit in with my family.

I spend too much time alone.

My friendships do not last very long.

I keep to myself at work.

I avoid showing affection to others.

I seldom speak with my friends.

I feel valued by my friends.

I make a positive difference in others' lives.

My co-workers think I am a hard worker.

I feel valued by my family.

I am proud of my reputation at work.

I feel valued in my romantic relationships.

My family is proud of me.

My co-workers respect me.

I am proud of my reputation with friends.

I feel appreciated by others.

My family respects me.

My friends are proud of me.

I get praise from others when I do something well.

I feel valued at my job.

My friends think I am considerate.

My life feels meaningless.

I feel uncomfortable at events that include spiritual components.

I do not believe in a higher power.

I avoid thinking about the purpose of my life.

I believe spirituality will hurt more than it will help.

I feel defeated.

I believe my life has no purpose.

I avoid activities that involve spiritual components.

I am afraid to explore spirituality.

I have no reason to believe in a higher power.

I rarely feel at peace.

Being spiritual does not help me.

I feel abandoned by a higher power.

I do not see the point of spirituality.

I feel disconnected from anything outside of myself.

Spirituality is important to me.

I participate in spiritual practices with my family.

I feel connected to something greater than myself.

I pray regularly.

I make time for spirituality in my life.

Feeling connected to something greater than myself (e.g., nature, spirituality, religion) is important to me.

I participate in spiritual practices with my friends.

I cope with challenges by having faith things will get better.

I participate in spiritual practices alone.

I have had an experience that increased my spiritual beliefs.

I have had an experience that can only be explained by faith.

My spirituality gives me hope.

I have experienced a miracle.

I am trying to grow spiritually.

My belief in something greater than myself gives me hope.

I am willing and able to complete household chores.

I am willing and able to follow directions for the medicines I take.

I am willing and able to take care of myself when I am sick.

I am willing and able to shower or bathe by myself regularly.

I am willing and able to follow directions doctors give me exactly.

I am willing and able to get around my house without support.

I am willing and able to get out of bed daily.

I am willing and able to eat fruits and vegetables regularly.

I am willing and able to care for minor injuries (e.g., cuts, scrapes).

I am willing and able to protect myself from sexually transmitted diseases.

I am willing and able to cope with stress.

I am willing and able to avoid unsafe situations.

I am willing and able to cope with anxiety.

I am willing and able to manage uncomfortable feelings.

I am willing and able to let others know where I am going when I leave home.

I am willing and able to follow through on goals I set for myself.

I am willing and able to learn from my mistakes.

I am willing and able to ask for help when I have difficulty doing something.

I am willing and able to take pride in things I work hard at.

I am willing and able to keep promises I make to myself.

I am willing and able to keep plans I make.

I am willing and able to stay in touch with friends.

I am willing and able to make friends outside of work.

I am willing and able to stay in touch with family.

I am willing and able to plan a social activity with my friends.

I am willing and able to share something I am proud of with friends or family.

I am willing and able to accomplish something outside of work I am proud of.

I am willing and able to feel proud of myself.

I am willing and able to accept praise from others.

I am willing and able to follow through when I tell someone I am going to do something.

I am willing and able to believe in something greater than myself (e.g., nature, spirituality, religion).

I am willing and able to make time for my own spiritual practice.

I am willing and able to explore what spirituality means to me.

I am willing and able to connect with other people through spiritual practices.

I am willing and able to participate in spiritual practices.

I am willing and able to make time for self-reflection.

I am willing and able to think about the purpose of my life.

I am willing and able to continue growing spiritually.

I am willing and able to find hope through spiritual practices.

I am willing and able to make time to connect with something greater than myself (e.g., nature, spirituality, religion).

I often feel tired when I use alcohol or drugs.

I get sick easily when I use alcohol or drugs.

I am physically unable to drive when I use alcohol or drugs.

I do not eat enough when I use alcohol or drugs.

I need help to shower or bathe when I use alcohol or drugs.

I often have a headache when I use alcohol or drugs.

I seldom have access to clean water when I use alcohol or drugs.

I sleep too much when I use alcohol or drugs.

I sometimes cannot afford to buy food when I use alcohol or drugs.

I sometimes cannot afford to buy clothing when I use alcohol or drugs.

I often have stomach pain when I use alcohol or drugs.

I sometimes trip, fall, or lose my balance when I use alcohol or drugs.

It takes a long time for my cuts and scrapes to heal when I use alcohol or drugs.

My stomach gets upset easily when I use alcohol or drugs.

I sometimes put myself at risk of getting an STD when I use alcohol or drugs.

I eat at regular times during the day when I use alcohol or drugs.

I feel rested when I wake each morning when I use alcohol or drugs.

I feel physically healthy when I use alcohol or drugs.

I eat fruits and vegetables regularly when I use alcohol or drugs.

I rarely get sick when I use alcohol or drugs.

I follow directions exactly when I take medications when I use alcohol or drugs.

I am rarely in physical pain when I use alcohol or drugs.

I exercise regularly when I use alcohol or drugs.

I wake up about the same time each day when I use alcohol or drugs.

I am physically able to do household chores when I use alcohol or drugs.

I regularly spend time outside when I use alcohol or drugs.

I go to bed about the same time every day when I use alcohol or drugs.

I am physically able to move around my house without help when I use alcohol or drugs.

My weight has been stable this past year when I use alcohol or drugs.

I follow the directions doctors give me when I use alcohol or drugs.

I sometimes cannot afford to heat my home when I use alcohol or drugs.

I feel unsafe in my home when I use alcohol or drugs.

I sometimes cannot afford to cool my home when I use alcohol or drugs.

I feel unsafe in my neighborhood when I use alcohol or drugs.

I sometimes cannot afford to pay my electric bill when I use alcohol or drugs.

My life feels out of control when I use alcohol or drugs.

I worry about being physically abused when I use alcohol or drugs.

I feel unsafe when I am alone when I use alcohol or drugs.

I worry I might become a victim of crime in my neighborhood when I use alcohol or drugs.

I cannot afford to pay my rent or mortgage when I use alcohol or drugs.

I feel afraid when I use alcohol or drugs.

I worry about being emotionally abused when I use alcohol or drugs.

I am sometimes in situations where I feel unsafe when I use alcohol or drugs.

I worry about being sexually abused when I use alcohol or drugs.

I worry about how I will pay my bills when I use alcohol or drugs.

I know what I am good at when I use alcohol or drugs.

I am responsible when I use alcohol or drugs.

I try to improve my skills when I use alcohol or drugs.

I ask for help when I need it when I use alcohol or drugs.

I learn from my mistakes when I use alcohol or drugs.

I try to make the best of bad situations when I use alcohol or drugs.

I do not give up easily when I use alcohol or drugs.

I work hard to achieve my goals when I use alcohol or drugs.

I keep promises I make to others when I use alcohol or drugs.

I keep promises I make to myself when I use alcohol or drugs.

I am honest with others when I use alcohol or drugs.

I make a positive difference in others' lives when I use alcohol or drugs.

I rebound from setbacks when I use alcohol or drugs.

I easily adapt to change when I use alcohol or drugs.

I practice things that are hard for me until I improve when I use alcohol or drugs.

It is hard for me to make friends when I use alcohol or drugs.

I keep to myself too much when I use alcohol or drugs.

I do not have enough friends when I use alcohol or drugs.

I avoid getting close to others when I use alcohol or drugs.

Most people do not understand me when I use alcohol or drugs.

It is hard for me to keep friends when I use alcohol or drugs.

I am too careful about who I get close to when I use alcohol or drugs.

I feel judged by others when I use alcohol or drugs.

I do not fit in with my friends when I use alcohol or drugs.

I do not fit in with my family when I use alcohol or drugs.

I spend too much time alone when I use alcohol or drugs.

My friendships do not last very long when I use alcohol or drugs.

I keep to myself at work when I use alcohol or drugs.

I avoid showing affection to others when I use alcohol or drugs.

I seldom speak with my friends when I use alcohol or drugs.

I feel valued by my friends when I use alcohol or drugs.

I make a positive difference in others' lives when I use alcohol or drugs.

My co-workers think I am a hard worker when I use alcohol or drugs.

I feel valued by my family when I use alcohol or drugs.

I am proud of my reputation at work when I use alcohol or drugs.

I feel valued in my romantic relationships when I use alcohol or drugs.

My family is proud of me when I use alcohol or drugs.

My co-workers respect me when I use alcohol or drugs.

I am proud of my reputation with friends when I use alcohol or drugs.

I feel appreciated by others when I use alcohol or drugs.

My family respects me when I use alcohol or drugs.

My friends are proud of me when I use alcohol or drugs.

I get praise from others when I do something well when I use alcohol or drugs.

I feel valued at my job when I use alcohol or drugs.

My friends think I am considerate when I use alcohol or drugs.

My life feels meaningless when I use alcohol or drugs.

I feel uncomfortable at events that include spiritual components when I use alcohol or drugs.

I do not believe in a higher power when I use alcohol or drugs.

I avoid thinking about the purpose of my life when I use alcohol or drugs.

I believe spirituality will hurt more than it will help when I use alcohol or drugs.

I feel defeated when I use alcohol or drugs.

I believe my life has no purpose when I use alcohol or drugs.

I avoid activities that involve spiritual components when I use alcohol or drugs.

I am afraid to explore spirituality when I use alcohol or drugs.

I have no reason to believe in a higher power when I use alcohol or drugs.

I rarely feel at peace when I use alcohol or drugs.

Being spiritual does not help me when I use alcohol or drugs.

I feel abandoned by a higher power when I use alcohol or drugs.

I do not see the point of spirituality when I use alcohol or drugs.

I feel disconnected from anything outside of myself when I use alcohol or drugs.

Spirituality is important to me when I use alcohol or drugs.

I participate in spiritual practices with my family when I use alcohol or drugs.

I feel connected to something greater than myself when I use alcohol or drugs.

I pray regularly when I use alcohol or drugs.

I make time for spirituality in my life when I use alcohol or drugs.

Feeling connected to something greater than myself (e.g., nature, spirituality, religion) is important to me when I use alcohol or drugs.

I participate in spiritual practices with my friends when I use alcohol or drugs.

I cope with challenges by having faith things will get better when I use alcohol or drugs.

I participate in spiritual practices alone when I use alcohol or drugs.

I have had an experience that increased my spiritual beliefs when I use alcohol or drugs.

I have had an experience that can only be explained by faith when I use alcohol or drugs.

My spirituality gives me hope when I use alcohol or drugs.

I have experienced a miracle when I use alcohol or drugs.

I am trying to grow spiritually when I use alcohol or drugs.

My belief in something greater than myself gives me hope when I use alcohol or drugs.

I am willing and able to complete household chores when I use alcohol or drugs.

I am willing and able to follow directions for the medicines I take when I use alcohol or drugs.

I am willing and able to take care of myself when I am sick when I use alcohol or drugs.

I am willing and able to shower or bathe by myself regularly when I use alcohol or drugs.

I am willing and able to follow directions doctors give me exactly when I use alcohol or drugs.

I am willing and able to get around my house without support when I use alcohol or drugs.

I am willing and able to get out of bed daily when I use alcohol or drugs.

I am willing and able to eat fruits and vegetables regularly when I use alcohol or drugs.

I am willing and able to care for minor injuries (e.g., cuts, scrapes) when I use alcohol or drugs.

I am willing and able to protect myself from sexually transmitted diseases when I use alcohol or drugs.

I am willing and able to cope with stress when I use alcohol or drugs.

I am willing and able to avoid unsafe situations when I use alcohol or drugs.

I am willing and able to cope with anxiety when I use alcohol or drugs.

I am willing and able to manage uncomfortable feelings when I use alcohol or drugs.

I am willing and able to let others know where I am going when I leave home when I use alcohol or drugs.

I am willing and able to follow through on goals I set for myself when I use alcohol or drugs.

I am willing and able to learn from my mistakes when I use alcohol or drugs.

I am willing and able to ask for help when I have difficulty doing something when I use alcohol or drugs.

I am willing and able to take pride in things I work hard at when I use alcohol or drugs.

I am willing and able to keep promises I make to myself when I use alcohol or drugs.

I am willing and able to keep plans I make when I use alcohol or drugs.

I am willing and able to stay in touch with friends when I use alcohol or drugs.

I am willing and able to make friends outside of work when I use alcohol or drugs.

I am willing and able to stay in touch with family when I use alcohol or drugs.

I am willing and able to plan a social activity with my friends when I use alcohol or drugs.

I am willing and able to share something I am proud of with friends or family when I use alcohol or drugs.

I am willing and able to accomplish something outside of work I am proud of when I use alcohol or drugs.

I am willing and able to feel proud of myself when I use alcohol or drugs.

I am willing and able to accept praise from others when I use alcohol or drugs.

I am willing and able to follow through when I tell someone I am going to do something when I use alcohol or drugs.

I am willing and able to believe in something greater than myself (e.g., nature, spirituality, religion) when I use alcohol or drugs.

I am willing and able to make time for my own spiritual practice when I use alcohol or drugs.

I am willing and able to explore what spirituality means to me when I use alcohol or drugs.

I am willing and able to connect with other people through spiritual practices when I use alcohol or drugs.

I am willing and able to participate in spiritual practices when I use alcohol or drugs.

I am willing and able to make time for self-reflection when I use alcohol or drugs.

I am willing and able to think about the purpose of my life when I use alcohol or drugs.

I am willing and able to continue growing spiritually when I use alcohol or drugs.

I am willing and able to find hope through spiritual practices when I use alcohol or drugs.

I am willing and able to make time to connect with something greater than myself (e.g., nature, spirituality, religion) when I use alcohol or drugs.

The following items are rated on the following scale: Never/Monthly or less/2 to 4 times a month;2 to 3 times a week/4 or more times a week

How often do you have a drink containing alcohol?

The following item is rated on the following scale: 1 or 2/3 or 4/ 5 or 6/7, 8, or 9/10 or more

How many drinks containing alcohol do you have on a typical day when you are drinking?

The following items are rated on the following scale: Never/Less than monthly/Monthly/Weekly/Daily or almost daily

How often do you have six or more drinks on one occasion?

How often during the last year have you found that you were not able to stop drinking once you had started?

How often during the last year have you failed to do what was normally expected from you because of your drinking?

How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session?

How often during the last year have you had a feeling of guilt or remorse after drinking?

How often during the last year have you been unable to remember what happened the night before because you had been drinking?

The following items are rated on the following scale: No/Yes, but not in the last year/Yes, during the last year

Have you or someone else been injured as a result of your drinking?

Has a relative or friend or doctor or another health worker been concerned about your drinking or suggested you cut down?

The following items are rated on a bipolar scale (yes/no)

Have you used drugs other than those required for medical reasons?

Have you abused prescription drugs?

Do you abuse more than one drug at a time?

Are you always able to stop using drugs when you want to?

Do you abuse drugs on a continuous basis?

Do you try to limit your drug use to certain situations?

Have you had “blackouts” or “flashbacks” as a result of drug use?

Do you ever feel bad about your drug abuse?

Do your friends or relatives know or suspect you abuse drugs?

Has drug abuse ever created problems between you and your spouse?

Have you been treated as an outpatient for problems related to drug abuse?

Have you ever been involved in a treatment program specifically related to drug use?

Have you ever neglected your family or missed work because of your use of drugs?

Have you ever been in trouble at work because of drug abuse?

Have you ever lost a job because of drug abuse?

Have you gotten into fights when under the influence of drugs?

Have you ever been arrested because of unusual behavior while under the influence of drugs?

Have you ever been arrested for driving while under the influence of drugs?

Have you engaged in illegal activities in order to obtain drugs?

Have you ever been arrested for possession of illegal drugs?

Have you ever experienced withdrawal symptoms as a result of heavy drug intake?

Have you had medical problems as a result of your drug use (e.g., memory loss, hepatitis, convulsions, bleeding, etc.)?

Have you ever gone to anyone for help for a drug problem?

Have you ever been in a hospital for medical problems related to your drug use?

Can you get through the week without using drugs (other than those required for medical reasons)?

Has any family member ever sought help for problems related to your drug use?

Have you ever lost friends because of your use of drugs?

Does your spouse (or parents) ever complain about your involvement with drugs?

APPENDIX E: WHIMM FINAL ITEMS

The following items are rated on the following scale: Strongly disagree/Disagree/Slightly disagree/Slightly agree/Agree/Strongly agree

I often feel tired.

I get sick easily.

I am physically unable to drive.

I do not eat enough.

I need help to shower or bathe.

I often have a headache.

I seldom have access to clean water.

I sleep too much.

I sometimes cannot afford to buy food.

I sometimes cannot afford to buy clothing.

I often have stomach pain.

I sometimes trip, fall, or lose my balance.

It takes a long time for my cuts and scrapes to heal.

My stomach gets upset easily.

I sometimes put myself at risk of getting an STD.

I eat at regular times during the day.

I feel rested when I wake each morning.

I feel physically healthy.

I eat fruits and vegetables regularly.

I rarely get sick.

I follow directions exactly when I take medications.

I am rarely in physical pain.

I exercise regularly.

I wake up about the same time each day.

I am physically able to do household chores.

I regularly spend time outside.

I go to bed about the same time every day.

I am physically able to move around my house without help.

My weight has been stable this past year.

I follow the directions doctors give me.

I sometimes cannot afford to heat my home.

I feel unsafe in my home.

I sometimes cannot afford to cool my home.

I feel unsafe in my neighborhood.

I sometimes cannot afford to pay my electric bill.

My life feels out of control.

I worry about being physically abused.

I feel unsafe when I am alone.

I worry I might become a victim of crime in my neighborhood.

I cannot afford to pay my rent or mortgage.

I feel afraid.

I worry about being emotionally abused.

I am sometimes in situations where I feel unsafe.

I worry about being sexually abused.

I worry about how I will pay my bills.

I know what I am good at.

I am responsible.

I try to improve my skills.

I ask for help when I need it.

I learn from my mistakes.

I try to make the best of bad situations.

I do not give up easily.

I work hard to achieve my goals.

I keep promises I make to others.

I keep promises I make to myself.

I am honest with others.

I make a positive difference in others' lives.

I rebound from setbacks.

I easily adapt to change.

I practice things that are hard for me until I improve.

It is hard for me to make friends.

I keep to myself too much.

I do not have enough friends.

I avoid getting close to others.

Most people do not understand me.

It is hard for me to keep friends.

I am too careful about who I get close to.

I feel judged by others.

I do not fit in with my friends.

I do not fit in with my family.

I spend too much time alone.

My friendships do not last very long.

I keep to myself at work.

I avoid showing affection to others.

I seldom speak with my friends.

I feel valued by my friends.

I make a positive difference in others' lives.

My co-workers think I am a hard worker.

I feel valued by my family.

I am proud of my reputation at work.

I feel valued in my romantic relationships.

My family is proud of me.

My co-workers respect me.

I am proud of my reputation with friends.

I feel appreciated by others.

My family respects me.

My friends are proud of me.

I get praise from others when I do something well.

I feel valued at my job.

My friends think I am considerate.

My life feels meaningless.

I feel uncomfortable at events that include spiritual components.

I do not believe in a higher power.

I avoid thinking about the purpose of my life.

I believe spirituality will hurt more than it will help.

I feel defeated.

I believe my life has no purpose.

I avoid activities that involve spiritual components.

I am afraid to explore spirituality.

I have no reason to believe in a higher power.

I rarely feel at peace.

Being spiritual does not help me.

I feel abandoned by a higher power.

I do not see the point of spirituality.

I feel disconnected from anything outside of myself.

Spirituality is important to me.

I participate in spiritual practices with my family.

I feel connected to something greater than myself.

I pray regularly.

I make time for spirituality in my life.

Feeling connected to something greater than myself (e.g., nature, spirituality, religion) is important to me.

I participate in spiritual practices with my friends.

I cope with challenges by having faith things will get better.

I participate in spiritual practices alone.

I have had an experience that increased my spiritual beliefs.

I have had an experience that can only be explained by faith.

My spirituality gives me hope.

I have experienced a miracle.

I am trying to grow spiritually.

My belief in something greater than myself gives me hope.

I am willing and able to complete household chores.

I am willing and able to follow directions for the medicines I take.

I am willing and able to take care of myself when I am sick.

I am willing and able to shower or bathe by myself regularly.

I am willing and able to follow directions doctors give me exactly.

I am willing and able to get around my house without support.

I am willing and able to get out of bed daily.

I am willing and able to eat fruits and vegetables regularly.

I am willing and able to care for minor injuries (e.g., cuts, scrapes).

I am willing and able to protect myself from sexually transmitted diseases.

I am willing and able to cope with stress.

I am willing and able to avoid unsafe situations.

I am willing and able to cope with anxiety.

I am willing and able to manage uncomfortable feelings.

I am willing and able to let others know where I am going when I leave home.

I am willing and able to follow through on goals I set for myself.

I am willing and able to learn from my mistakes.

I am willing and able to ask for help when I have difficulty doing something.

I am willing and able to take pride in things I work hard at.

I am willing and able to keep promises I make to myself.

I am willing and able to keep plans I make.

I am willing and able to stay in touch with friends.

I am willing and able to make friends outside of work.

I am willing and able to stay in touch with family.

I am willing and able to plan a social activity with my friends.

I am willing and able to share something I am proud of with friends or family.

I am willing and able to accomplish something outside of work I am proud of.

I am willing and able to feel proud of myself.

I am willing and able to accept praise from others.

I am willing and able to follow through when I tell someone I am going to do something.

I am willing and able to believe in something greater than myself (e.g., nature, spirituality, religion).

I am willing and able to make time for my own spiritual practice.

I am willing and able to explore what spirituality means to me.

I am willing and able to connect with other people through spiritual practices.

I am willing and able to participate in spiritual practices.

I am willing and able to make time for self-reflection.

I am willing and able to think about the purpose of my life.

I am willing and able to continue growing spiritually.

I am willing and able to find hope through spiritual practices.

I am willing and able to make time to connect with something greater than myself (e.g., nature, spirituality, religion).

I often feel tired when I use alcohol or drugs.

I get sick easily when I use alcohol or drugs.

I am physically unable to drive when I use alcohol or drugs.

I do not eat enough when I use alcohol or drugs.

I need help to shower or bathe when I use alcohol or drugs.

I often have a headache when I use alcohol or drugs.

I seldom have access to clean water when I use alcohol or drugs.

I sleep too much when I use alcohol or drugs.

I sometimes cannot afford to buy food when I use alcohol or drugs.

I sometimes cannot afford to buy clothing when I use alcohol or drugs.

I often have stomach pain when I use alcohol or drugs.

I sometimes trip, fall, or lose my balance when I use alcohol or drugs.

It takes a long time for my cuts and scrapes to heal when I use alcohol or drugs.

My stomach gets upset easily when I use alcohol or drugs.

I sometimes put myself at risk of getting an STD when I use alcohol or drugs.

I eat at regular times during the day when I use alcohol or drugs.

I feel rested when I wake each morning when I use alcohol or drugs.

I feel physically healthy when I use alcohol or drugs.

I eat fruits and vegetables regularly when I use alcohol or drugs.

I rarely get sick when I use alcohol or drugs.

I follow directions exactly when I take medications when I use alcohol or drugs.

I am rarely in physical pain when I use alcohol or drugs.

I exercise regularly when I use alcohol or drugs.

I wake up about the same time each day when I use alcohol or drugs.

I am physically able to do household chores when I use alcohol or drugs.

I regularly spend time outside when I use alcohol or drugs.

I go to bed about the same time every day when I use alcohol or drugs.

I am physically able to move around my house without help when I use alcohol or drugs.

My weight has been stable this past year when I use alcohol or drugs.

I follow the directions doctors give me when I use alcohol or drugs.

I sometimes cannot afford to heat my home when I use alcohol or drugs.

I feel unsafe in my home when I use alcohol or drugs.

I sometimes cannot afford to cool my home when I use alcohol or drugs.

I feel unsafe in my neighborhood when I use alcohol or drugs.

I sometimes cannot afford to pay my electric bill when I use alcohol or drugs.

My life feels out of control when I use alcohol or drugs.

I worry about being physically abused when I use alcohol or drugs.

I feel unsafe when I am alone when I use alcohol or drugs.

I worry I might become a victim of crime in my neighborhood when I use alcohol or drugs.

I cannot afford to pay my rent or mortgage when I use alcohol or drugs.

I feel afraid when I use alcohol or drugs.

I worry about being emotionally abused when I use alcohol or drugs.

I am sometimes in situations where I feel unsafe when I use alcohol or drugs.

I worry about being sexually abused when I use alcohol or drugs.

I worry about how I will pay my bills when I use alcohol or drugs.

I know what I am good at when I use alcohol or drugs.

I am responsible when I use alcohol or drugs.

I try to improve my skills when I use alcohol or drugs.

I ask for help when I need it when I use alcohol or drugs.

I learn from my mistakes when I use alcohol or drugs.

I try to make the best of bad situations when I use alcohol or drugs.

I do not give up easily when I use alcohol or drugs.

I work hard to achieve my goals when I use alcohol or drugs.

I keep promises I make to others when I use alcohol or drugs.

I keep promises I make to myself when I use alcohol or drugs.

I am honest with others when I use alcohol or drugs.

I make a positive difference in others' lives when I use alcohol or drugs.

I rebound from setbacks when I use alcohol or drugs.

I easily adapt to change when I use alcohol or drugs.

I practice things that are hard for me until I improve when I use alcohol or drugs.

It is hard for me to make friends when I use alcohol or drugs.

I keep to myself too much when I use alcohol or drugs.

I do not have enough friends when I use alcohol or drugs.

I avoid getting close to others when I use alcohol or drugs.

Most people do not understand me when I use alcohol or drugs.

It is hard for me to keep friends when I use alcohol or drugs.

I am too careful about who I get close to when I use alcohol or drugs.

I feel judged by others when I use alcohol or drugs.

I do not fit in with my friends when I use alcohol or drugs.

I do not fit in with my family when I use alcohol or drugs.

I spend too much time alone when I use alcohol or drugs.

My friendships do not last very long when I use alcohol or drugs.

I keep to myself at work when I use alcohol or drugs.

I avoid showing affection to others when I use alcohol or drugs.

I seldom speak with my friends when I use alcohol or drugs.

I feel valued by my friends when I use alcohol or drugs.

I make a positive difference in others' lives when I use alcohol or drugs.

My co-workers think I am a hard worker when I use alcohol or drugs.

I feel valued by my family when I use alcohol or drugs.

I am proud of my reputation at work when I use alcohol or drugs.

I feel valued in my romantic relationships when I use alcohol or drugs.

My family is proud of me when I use alcohol or drugs.

My co-workers respect me when I use alcohol or drugs.

I am proud of my reputation with friends when I use alcohol or drugs.

I feel appreciated by others when I use alcohol or drugs.

My family respects me when I use alcohol or drugs.

My friends are proud of me when I use alcohol or drugs.

I get praise from others when I do something well when I use alcohol or drugs.

I feel valued at my job when I use alcohol or drugs.

My friends think I am considerate when I use alcohol or drugs.

My life feels meaningless when I use alcohol or drugs.

I feel uncomfortable at events that include spiritual components when I use alcohol or drugs.

I do not believe in a higher power when I use alcohol or drugs.

I avoid thinking about the purpose of my life when I use alcohol or drugs.

I believe spirituality will hurt more than it will help when I use alcohol or drugs.

I feel defeated when I use alcohol or drugs.

I believe my life has no purpose when I use alcohol or drugs.

I avoid activities that involve spiritual components when I use alcohol or drugs.

I am afraid to explore spirituality when I use alcohol or drugs.

I have no reason to believe in a higher power when I use alcohol or drugs.

I rarely feel at peace when I use alcohol or drugs.

Being spiritual does not help me when I use alcohol or drugs.

I feel abandoned by a higher power when I use alcohol or drugs.

I do not see the point of spirituality when I use alcohol or drugs.

I feel disconnected from anything outside of myself when I use alcohol or drugs.

Spirituality is important to me when I use alcohol or drugs.

I participate in spiritual practices with my family when I use alcohol or drugs.

I feel connected to something greater than myself when I use alcohol or drugs.

I pray regularly when I use alcohol or drugs.

I make time for spirituality in my life when I use alcohol or drugs.

Feeling connected to something greater than myself (e.g., nature, spirituality, religion) is important to me when I use alcohol or drugs.

I participate in spiritual practices with my friends when I use alcohol or drugs.

I cope with challenges by having faith things will get better when I use alcohol or drugs.

I participate in spiritual practices alone when I use alcohol or drugs.

I have had an experience that increased my spiritual beliefs when I use alcohol or drugs.

I have had an experience that can only be explained by faith when I use alcohol or drugs.

My spirituality gives me hope when I use alcohol or drugs.

I have experienced a miracle when I use alcohol or drugs.

I am trying to grow spiritually when I use alcohol or drugs.

My belief in something greater than myself gives me hope when I use alcohol or drugs.

I am willing and able to complete household chores when I use alcohol or drugs.

I am willing and able to follow directions for the medicines I take when I use alcohol or drugs.

I am willing and able to take care of myself when I am sick when I use alcohol or drugs.

I am willing and able to shower or bathe by myself regularly when I use alcohol or drugs.

I am willing and able to follow directions doctors give me exactly when I use alcohol or drugs.

I am willing and able to get around my house without support when I use alcohol or drugs.

I am willing and able to get out of bed daily when I use alcohol or drugs.

I am willing and able to eat fruits and vegetables regularly when I use alcohol or drugs.

I am willing and able to care for minor injuries (e.g., cuts, scrapes) when I use alcohol or drugs.

I am willing and able to protect myself from sexually transmitted diseases when I use alcohol or drugs.

I am willing and able to cope with stress when I use alcohol or drugs.

I am willing and able to avoid unsafe situations when I use alcohol or drugs.

I am willing and able to cope with anxiety when I use alcohol or drugs.

I am willing and able to manage uncomfortable feelings when I use alcohol or drugs.

I am willing and able to let others know where I am going when I leave home when I use alcohol or drugs.

I am willing and able to follow through on goals I set for myself when I use alcohol or drugs.

I am willing and able to learn from my mistakes when I use alcohol or drugs.

I am willing and able to ask for help when I have difficulty doing something when I use alcohol or drugs.

I am willing and able to take pride in things I work hard at when I use alcohol or drugs.

I am willing and able to keep promises I make to myself when I use alcohol or drugs.

I am willing and able to keep plans I make when I use alcohol or drugs.

I am willing and able to stay in touch with friends when I use alcohol or drugs.

I am willing and able to make friends outside of work when I use alcohol or drugs.

I am willing and able to stay in touch with family when I use alcohol or drugs.

I am willing and able to plan a social activity with my friends when I use alcohol or drugs.

I am willing and able to share something I am proud of with friends or family when I use alcohol or drugs.

I am willing and able to accomplish something outside of work I am proud of when I use alcohol or drugs.

I am willing and able to feel proud of myself when I use alcohol or drugs.

I am willing and able to accept praise from others when I use alcohol or drugs.

I am willing and able to follow through when I tell someone I am going to do something when I use alcohol or drugs.

I am willing and able to believe in something greater than myself (e.g., nature, spirituality, religion) when I use alcohol or drugs.

I am willing and able to make time for my own spiritual practice when I use alcohol or drugs.

I am willing and able to explore what spirituality means to me when I use alcohol or drugs.

I am willing and able to connect with other people through spiritual practices when I use alcohol or drugs.

I am willing and able to participate in spiritual practices when I use alcohol or drugs.

I am willing and able to make time for self-reflection when I use alcohol or drugs.

I am willing and able to think about the purpose of my life when I use alcohol or drugs.

I am willing and able to continue growing spiritually when I use alcohol or drugs.

I am willing and able to find hope through spiritual practices when I use alcohol or drugs.

I am willing and able to make time to connect with something greater than myself (e.g., nature, spirituality, religion) when I use alcohol or drugs.

APPENDIX F: INFORMED CONSENT FORM

Research Participation Informed Consent Form

School Psychology and Counselor Education Department

College of William and Mary

Protocol# EDRIC-2015-05-07-10400-aewilliams

Research Study Title: Williams Hierarchical Integrated Model Measurement: Assessment Design, Construction, and Initial Validation

Principal Investigator: Amy E. Williams (Charles F. Gressard, Chair)

This is to certify that I have been given the following information with respect to my participation in this study:

1. Purpose of the research: To develop and improve a measurement tool for individuals who have thought about cutting back on alcohol or drug use.
2. Procedure to be followed: You will be asked to complete the pilot test online. Your completion of this test ends your participation in this study.
3. Discomforts and risks: There are no known risks to participating in this study.

4. Duration of participation: Participation in this study will take approximately 15 minutes.

5. Statement of confidentiality: Your data will be confidential. Your data will not be associated with your name so your responses cannot be linked to your name in any way. All data and records will be stored on password-protected computers in a secure database meant to hold confidential data.

6. Voluntary participation: Participation is voluntary. You are free to withdraw at any time without penalty or loss of benefits by exiting the test before submitting.

7. Incentive for participation: Participants will not be compensated for their participation.

8. Potential benefits: Your participation in this research will contribute to the development of this measurement tool.

9. Termination of participation: Participation may be terminated by the participant at any time prior to submitting the test online.

10. Questions or concerns regarding participation in this research should be directed to: Amy E. Williams, Ph.D. Candidate at aewilliams@email.wm.edu (804-313-0481). You may also contact Dr. Charles F. Gressard, Dissertation chair, at cfgres@wm.edu.

I am aware that I must be at least 18 years of age to participate in this project.

I am aware that I may report dissatisfactions with any aspect of this study to Dr. Ray McCoy, Ph.D., the Chair of the Protection of Human Subjects Committee by telephone (757-221-2783) or email (rwmcco@wm.edu).

THIS PROJECT WAS APPROVED BY THE COLLEGE OF
WILLIAM AND MARY PROTECTION OF HUMAN
SUBJECTS COMMITTEE (Phone: 757-221-3966) ON
[2015-05-07] AND EXPIRES ON [2016-05-07]

APPENDIX G: PILOT ONE AND FINAL INSTRUMENT DIRECTIONS

There are two parts to this assessment: one focusing on your responses when you ARE NOT regularly using alcohol and/or drugs, and one focusing on your responses when you ARE regularly using alcohol and/or drugs.

After you complete these two parts, you will be asked to provide demographic information. This information will be used only to describe the overall group of people who completed this assessment and will NOT be used to identify you in any way.

You will NOT be asked about your frequency, quantity, or type of alcohol or drug use at any point in this assessment. This assessment focuses on how you feel you function when you are and are not using alcohol and/or other drugs.

Part One:

For the following sets of items, select the response that best matches how you feel about each statement below.

Your responses should be based on how you generally feel WHEN YOU ARE NOT
REGULARLY USING ALCOHOL OR OTHER DRUGS.

Regular use may mean different things to different people.

For example, if you regularly drink or use drugs on weekends:

The time you are NOT regularly using alcohol or drugs will be the weekdays.

The time you ARE REGULARLY using alcohol or drugs will be the weekends.

If, for example, you use or used alcohol or drugs daily or almost daily:

The time you are NOT regularly using alcohol or drugs will be the last period of at least 5-7 days where you did not use either alcohol or drugs.

The time you ARE REGULARLY using alcohol or drugs will be the time from when you started using until all alcohol and drug use stops for at least 5-7 days.

Your alcohol or drug use patterns may be different, so use the above examples as guidelines to decide how best to respond to the items based on your own use patterns.

Select the response that best matches how you feel about each statement below.

Your responses should be based on how you generally feel WHEN YOU ARE NOT REGULARLY USING ALCOHOL OR OTHER DRUGS based upon your typical pattern of use.

You have completed part one of this two-part assessment.

There are two parts to this assessment: one focusing on your responses when you ARE NOT regularly using alcohol and/or drugs, and one focusing on your responses when you ARE regularly using alcohol and/or drugs.

Part Two:

For the following sets of items, select the response that best matches how you feel about each statement below.

Your responses should be based on how you generally feel WHEN YOU ARE
REGULARLY USING ALCOHOL OR OTHER DRUGS.

Regular use may mean different things to different people.

For example, if you regularly drink or use drugs on weekends:

The time you are NOT regularly using alcohol or drugs will be the weekdays.

The time you ARE REGULARLY using alcohol or drugs will be the weekends.

If, for example, you use or used alcohol or drugs daily or almost daily:

The time you are NOT regularly using alcohol or drugs will be the last period of at least

5-7days where you did not use either alcohol or drugs.

The time you ARE REGULARLY using alcohol or drugs will be the time from when you started using until all alcohol and drug use stops for at least 5-7 days.

Your alcohol or drug use patterns may be different, so use the above examples as guidelines to decide how best to respond to the items based on your own use patterns. Select the response that best matches how you feel about each statement below.

Your responses should be based on how you generally feel WHEN YOU ARE REGULARLY USING ALCOHOL OR OTHER DRUGS based upon your typical pattern of use.

You have now completed all parts of the assessment.

In this final section, you will be asked to provide demographic information.

This information will be used only to describe the overall group of people who completed this assessment and will NOT be used to identify you in any way.

APPENDIX H: WHIMM PILOT TWO DIRECTIONS

This second-round pilot assessment may look similar to an assessment you completed a few weeks ago. You should complete this survey even if you completed the previous one. The purpose of this assessment is to determine whether this test performs consistently over time and also to see whether it provides information that relates to data collected through other substance use assessments.

There are two main parts to this assessment: one focusing on your responses when you **ARE NOT** regularly using alcohol and/or drugs, and one focusing on your responses when you **ARE** regularly using drugs.

In addition to these two parts, there are additional questions asking about your alcohol and drug use patterns. These questions are being used **ONLY** to determine whether the instrument being piloted and the use-related questions collect related information. Your individual responses to these questions will not be analyzed or reported; only aggregate data for these items will be reviewed for analysis.

You will also be asked to provide demographic information. This information will be used only to describe the overall group of people who completed this assessment and will **NOT** be used to identify you in any way.

Part One:

For the following sets of items, select the response that best matches how you feel about each statement below.

Your responses should be based on how you generally feel WHEN YOU ARE NOT
REGULARLY USING ALCOHOL OR OTHER DRUGS.

Regular use may mean different things to different people.

For example, if you regularly drink or use drugs on weekends:

The time you are NOT regularly using alcohol or drugs will be the weekdays.

The time you ARE REGULARLY using alcohol or drugs will be the weekends.

If, for example, you use or used alcohol or drugs daily or almost daily:

The time you are NOT regularly using alcohol or drugs will be the last period of at least
5-7days where you did not use either alcohol or drugs.

The time you ARE REGULARLY using alcohol or drugs will be the time from when you
started using until all alcohol and drug use stops for at least 5-7 days.

Your alcohol or drug use patterns may be different, so use the above examples as guidelines to decide how best to respond to the items based on your own use patterns. Select the response that best matches how you feel about each statement below.

Your responses should be based on how you generally feel WHEN YOU ARE NOT REGULARLY USING ALCOHOL OR OTHER DRUGS based upon your typical pattern of use.

You have completed part one of this two-part assessment.

There are two parts to this assessment: one focusing on your responses when you ARE NOT regularly using alcohol and/or drugs, and one focusing on your responses when you ARE regularly using drugs.

Part Two:

For the following sets of items, select the response that best matches how you feel about each statement below.

Your responses should be based on how you generally feel WHEN YOU ARE REGULARLY USING ALCOHOL OR OTHER DRUGS.

Regular use may mean different things to different people.

For example, if you regularly drink or use drugs on weekends:

The time you are NOT regularly using alcohol or drugs will be the weekdays.

The time you ARE REGULARLY using alcohol or drugs will be the weekends.

If, for example, you use or used alcohol or drugs daily or almost daily:

The time you are NOT regularly using alcohol or drugs will be the last period of at least 5-7 days where you did not use either alcohol or drugs.

The time you ARE REGULARLY using alcohol or drugs will be the time from when you started using until all alcohol and drug use stops for at least 5-7 days.

Your alcohol or drug use patterns may be different, so use the above examples as guidelines to decide how best to respond to the items based on your own use patterns. Select the response that best matches how you feel about each statement below.

Your responses should be based on how you generally feel WHEN YOU ARE REGULARLY USING ALCOHOL OR OTHER DRUGS based upon your typical pattern of use.

AUDIT Directions: The following questions ask about your alcohol and drug use patterns. These questions are being used ONLY to determine whether the instrument being piloted and the use-related questions gather related information. Your individual responses to these questions will not be analyzed or reported; only aggregate data for these items will be reviewed for analysis.

Please answer these questions based upon your alcohol and drug use over the past YEAR.

DAST Directions: The following questions concern information about your involvement with drugs. Drug abuse refers to (1) the use of prescribed or “over-the-counter” drugs in excess of the directions, and (2) any non-medical use of drugs.

Consider the past year (12 months) and carefully read each statement. Then decide whether your answer is YES or NO and check the appropriate space. Please be sure to answer every question.

You have now completed all parts of the assessment.

In this final section, you will be asked to provide demographic information.

This information will be used only to describe the overall group of people who completed this assessment and will NOT be used to identify you in any way.

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