Assessing the Reliability and Validity of Scores from a Revised Version of the *Inventory of Drug Use Consequences*

by

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Abstract

The *Inventory of Drug Use Consequences* (InDUC; Miller, Tonigan, & Loganbaugh, 1995) is a commonly used self-report measure of negative consequences associated with alcohol and drug abuse. The present study investigated the psychometric properties of the Lifetime Version of the InDUC (InDUC-2L; Miller et al., 1995) and a revised version of the InDUC-2L that expanded the measure's dichotomous scale. One hundred and thirty-eight individuals participated in the current study. Both versions of the InDUC-2L demonstrated sound psychometric characteristics. With additional research, the revised version may be a valuable clinical tool for clinicians who work with individuals with substance use disorders.

Dedication

I wish to thank my family and friends who have helped me achieve my goals. The encouragement and support of my parents throughout my academic journey have allowed me to successfully deal with the unknown, conquer the challenges and embrace my accomplishments. You have always helped to keep the challenges in perspective and encouraged me to maintain balance while pursuing my goals. After countless late nights and early mornings spent proofreading my work, the two of you definitely deserve an honorary degree! Your love is a wonderful gift!

The key to happiness is having dreams; the key to success is making dreams come true.

~ Anonymous

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Chapter I

Introduction

Prevalence of Alcohol and Illicit Drug Use. The World Health Organization (WHO; 2003), estimated that more than 76 million individuals worldwide have a diagnosable alcohol use disorder and at least 15 million persons have a drug use disorder. The *National Survey of Drug Use and Health* (NSDUH) conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA; 2006), suggested the use of alcohol and illicit drugs by residents of the United States is widespread, as is the number of individuals diagnosed with a substance use disorder (SUD).

More specifically, an estimated 22.2 million persons aged 12 or older, or 9.1% of the population aged 12 or older in 2005, were classified with substance abuse or dependence in the past year based on criteria specified in the 4th edition text revision of the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000). Of these, 15.4 million met diagnostic criteria for alcohol abuse or dependence, 3.6 million met diagnostic criteria for illicit drug abuse or dependence, and 3.3 million met diagnostic criteria for abuse or dependence on both alcohol and illicit drugs (SAMHSA, 2006).

According to the NSDUH (SAMHSA, 2006), the rates of alcohol and illicit drug use demonstrated substantial variation by race, age, and gender. Clearly, substance use and the consequences associated with one's use affect individuals of all ages, genders, socioeconomic statuses, and ethnicities in today's society.

Consequences of Substance Use. A systematic review of the research literature suggested that there are several economic, social, psychological, and medical problems

associated with alcohol and other drug abuse and dependence (AODA/D; Babor et al., 1994). Such consequences include the (a) economic costs to society associated with health care expenditures, lost earnings and productivity in the workplace, legal costs due to crime, and accidents involving intoxicated individuals seeking drugs; (b) interpersonal costs related to frequent conflicts among family members, poor decision making and lowered inhibitions when one is drinking or using drugs; (c) increased financial problems that result from one's drinking or using drugs (i.e., costs of the drugs themselves, as well as the court, assessment, and treatment costs); and (d) medical consequences ranging from Fetal Alcohol Syndrome (FAS) to the specific diseases associated with substance use such as Hepatitis and AIDS (SAMHSA, 2001). Clearly, within a clinical setting there is a need to investigate the negative consequences associated with one's substance use in order to gain an accurate understanding of the client's background and presenting concerns, which aspects of the client's substance-related behaviors should be targeted for intervention, and the resources available to support specific changes (Tucker, Vuchinich, & Murphy, 2002).

Treatment Considerations: Accurate Assessment, Diagnosis, and the Importance of Assessing Consequences in Treatment. All of the above-mentioned costs of AODA/D are of concern to helping professionals whose responsibility is to accurately assess, diagnose the individual, engage the client in treatment, and intervene (Fisher & Harrison, 2005). Appropriate identification, diagnosis, and referral of clients struggling with alcohol or drug problems may make the difference between timely treatment and hours in therapy that fail to address the primary concern (Fisher & Harrison, 2005).

Substance use is a serious public health problem estimated to indirectly affect more than

150 million Americans (SAMHSA, 2005); however, numerous individuals with such problems remain undetected. This population includes those individuals who do not meet diagnostic criteria for AODA/D, but who are experiencing negative consequences associated with their substance use or are at risk for such consequences (Institute of Medicine, 1990; Allen & Wilson, 2003). Overlooking this particular population is unfortunate for two reasons. First, the individual's continued use holds significant potential for further AODA/D-related negative consequences. Second, it is not possible for clinicians to refer such individuals for appropriate services until they have been identified. As such, there is a need to develop and apply techniques to screen for alcohol and drug use disorders, as well as the negative consequences associated with such disorders.

Clinicians employed in any setting should expect to see a large number of clients affected by alcohol and other drugs (AOD), as numerous individuals routinely use and abuse alcohol, marijuana, cocaine, stimulants, sedatives and tranquilizers, and millions are addicted to nicotine. All counselors, regardless of whether they consider themselves "addiction specialists," have a responsibility to respond to the multitude of problems associated with substance use (Lewis, Dana, & Blevins, 2002). Conceptualizing drug or alcohol use as one aspect of a client's "unique constellation of behaviors and characteristics" has two implications for counselor's roles and responsibilities. First, generalists should be expected to assess substance abuse issues routinely, just as they would be expected to identify any other behaviors affecting their client's well-being. Second, addiction specialists should recognize their responsibility for dealing with the psychological, social and vocational issues that might interact with drug use, rather than

assuming they can limit the scope of their assessments and interventions to drinking or drug-taking behaviors alone (Lewis et al., 2002).

Lewis et al. (2002) also remind the counselor the mere use of alcohol or an illicit drug is not automatically problematic, as the individuals who often require the assistance of counselors are those who have developed life problems or health risks from their substance use. The authors conclude *every* counselor, whether a generalist or AODA counselor, should strive to recognize the unique differences among individuals with SUDs and attempt to address alcohol and drug use in the context of the client's total life functioning (Lewis et al., 2002).

In addition to reviewing patient records and interviewing informants, clinicians gather detailed information about the client's substance use history within the context of the client's total life functioning, through the use of screening and assessment: two unique procedures (Morrison, 1995). The term "screening" represents the "skillful use of empirically-based procedures for identifying individuals with substance-related problems or consequences, or those who are at risk for such difficulties", while an "assessment" is "designed to explore more fully the nature and extent of a person's problems with alcohol or illicit drugs, and to determine whether the individual meets criteria for a particular diagnostic category" (Allen & Wilson, 2003, p. 21).

From the clinician's perspective, the primary benefit of an assessment is to "accurately and efficiently determine the treatment needs of the client" (Allen & Wilson, 2003, p. 21). If an assessment is chosen carefully, it may "efficiently and validly evaluate" several variables associated with the client's presenting problem, including: severity of dependence, adverse consequences resulting from problematic use,

contributing roles of other emotional and behavioral problems, and cognitive and environmental stimuli for use. Allen and Wilson (2003) suggest all of these variables play an important role in identifying the intensity and nature of the necessary intervention.

The assessment process however, also yields "valuable secondary benefits" (Allen & Mattson, 1993, as cited in Allen & Wilson, 2003). An example of such a benefit would be providing clients with individualized feedback based on their test results. It is important for the clinician to recognize that providing the client with personalized feedback may enhance the client's motivation to change, reinforce their commitment for behavior change, and help them formulate personal goals (Allen & Wilson, 2003).

Similarly, Carroll (1997) asserted that providing clients with objective feedback about the negative consequences associated with their substance use, followed by a discussion about whether the client perceives him or herself as having substance-related problems and how treatment could address these difficulties, is an effective way to clarify the problems and motivate clients to change. Lastly, research indicates that clients themselves highly value assessment (Sobell, 1993 as cited in Allen & Wilson, 2003) and those programs with formalized assessment procedures are better able to retain clients in treatment (Allen & Wilson, 2003; Institute of Medicine, 1990).

Whatever the diagnosis and treatment setting, gathering detailed information about the consequences associated with one's substance use serves several purposes for both the client and clinician. These include engaging the client in treatment, increasing the client's motivation to change, and assisting the client with goal setting and treatment planning. Specific information about the negative consequences associated with the client's substance use may be gathered from a variety of sources including data obtained

from assessments such as, the *Drinker Inventory of Consequences* (DrInC; Appendix A) or the InDUC (Miller et al., 1995; Carroll, 1997).

Inventory of Drug Use Consequences. The DrInC (Miller et al., 1995), a parallel version of the InDUC (Miller et al., 1995), assesses negative consequences related to alcohol use. The primary difference between the DrInC and the InDUC is that the items that comprise the InDUC are worded to reflect consequences related to alcohol *and* other drugs versus alcohol only (Miller et al, 1995). In addition, the InDUC contains an item concerning spending time in jail or prison due to drug use, while the DrInC includes an item about gaining weight due to drinking (Miller et al., 1995).

The InDUC consists of 50 items that measure five dimensions of commonly experienced adverse consequences: (a) Physical, (b) Intrapersonal, (c) Interpersonal, (d) Social Responsibility, and (e) Impulse Control. The following is a representative sample of the types of items that comprise each scale: (a) My physical appearance has been harmed by my drinking or drug use (Physical), (b) I have felt bad about myself because of my drinking or drug use (Intrapersonal), (c) A friendship or close relationship has been damaged by my drinking or drug use (Interpersonal), (d) I have missed days of work or school because of my drinking or drug use (Social Responsibility), and (e) I have taken foolish risks when I have been drinking or using drugs (Impulse Control) (Miller et al., 1995). Purposefully excluded from the inventory are items referring to pathological use practices (e.g., rapid use), items reflecting dependence (e.g., craving), and items concerning help seeking (e.g., Alcoholics Anonymous). These exclusions are reflective of a consistent finding in the substance abuse literature that adverse consequences related to alcohol and drug use are only moderately correlated with quantity and frequency of use

and with measures of dependence (Institute of Medicine, 1990; Maisto & McKay, 1995 as cited in Gillaspy & Campbell, 2006; Miller et al., 1995). This finding has led researchers and clinicians to evaluate the severity of substance use consequences separately from other factors such as consumption, pathological drinking/use, cravings, etc. (Gillaspy & Campbell, 2006).

The consequences associated with drug and alcohol use may be assessed for two unique time frames, lifetime (InDUC-2L; Appendix B) and recent (InDUC-2R; Appendix C). Items on the InDUC-2R, which inquire about consequences within the last 90 days, are scored on a 4-point Likert scale that ranges from 0 (never) to 3 (daily or almost daily). Items on the InDUC-2L are scored in a dichotomous "yes/no" format where higher scores reflect more severe consequences. For both versions, scores can be computed for each subscale and for a total score of overall substance use consequences (Tonigan & Miller, 2002; Gillaspy & Campbell, 2006).

A thorough review of the assessment of consequences literature suggested the InDUC has been utilized in several clinical settings, and in a variety of clinical research. For instance, the assessment has been used to measure treatment outcome (Gillaspy, Wright, Stokes, Campbell, & Adinoff, 2002), to compare consequences across ethnic groups (Arciniega, Arroyo, & Miller, 1996 as cited in Gillaspy & Campbell, 2006), and to explore the relationship between sexual abuse and AOD consequences (Liebschutz et al., 2002).

The InDUC is a promising clinical and research tool, though questions remain about the reliability and validity of the InDUC's scores, including temporal and construct validity, and whether drug and alcohol use consequences are best conceptualized as a

multidimensional or unidimensional construct (Tonigan & Miller, 2002, Gillaspy & Campbell, 2006). In a two-part study involving both inpatient and outpatient clients, Tonigan and Miller (2002) evaluated the test-retest reliability of InDUC-2L scores and sensitivity to detect change and factor structure. Four of the five scales had good to excellent test-retest reliability. Confirmatory factor-analytic methods revealed a four-factor model fit the data better than the originally proposed five-factor model. In contrast, Blanchard, Morgenstern, Morgan, Labouvie, and Bux (2003) provided evidence that InDUC-2R items reflect one general consequence factor; however, Gillaspy & Campbell (2006) remind the reader that there may be many possible factor solutions for a measure. Altogether, Tonigan and Miller (2002) concluded that consequences of drug use should be measured directly rather than be inferred from measures of use.

Considering an estimated 3.3 million Americans met diagnostic criteria for dependence or abuse of both alcohol and illicit drugs in 2004 (SAMHSA, 2006), 718,000 persons received treatment for both alcohol *and* drugs, as well as the implications of examining the consequences associated with one's substance use, further investigation of the InDUC is warranted. With additional studies, including those that examine the measure's psychometric properties, it is likely that the lifetime version of the InDUC will be further improved and its utility better understood.

Statement of the Problem. Although there have been at least five studies conducted that investigate the psychometric properties of the DrInC (Miller et al., 1995; Anderson, Gogineni, Charuvastra, Longabaugh, & Stein, 2001), there are a limited number of studies that examine the psychometric properties of the InDUC. More specifically, three studies addressed the InDUC-2R (Gillaspy et al., 2002; Blanchard et

al., 2003; Gillaspy & Campbell, 2006), and two studies investigated the InDUC-2L (Tonigan & Miller, 2002; Gillaspy & Campbell, 2006). Although these studies address important psychometric issues, questions remain about the reliability and validity of the scores derived from the lifetime version of the InDUC.

In addition, there is a limited amount of information available regarding the dichotomous scale construction and item analysis of the InDUC-2L. Personal communication with one of the authors of the InDUC, Bill Miller, revealed, "The InDUC was clearly just an adaptation of the DrInC, using the same items and changing only the wording that did not make sense for drug use" (personal communication, March 4, 2005). The author failed to comment on the selection of the scale (dichotomous versus Likert-type).

To date, there have not been any studies that investigate the possibility of expanding the instrument's dichotomous scale to a Likert-type Scale (0 = Never, 1 = Rarely, 2 = Sometimes, 3 = Always) similar to that used for the 3-month version of the InDUC-2R (i.e., never, once or a few times, once or twice a week, daily or almost daily), and the impact this would have on the measure's psychometric properties. Miller et al. (1995) hypothesize that asking for clarification and examples of each adverse experience would allow the clinician to gain a more accurate understanding of the client's lifetime use, thus it is expected that expanding the measure's dichotomous scale with the intent to gather more specific information about the frequency and extent of consequences, would also facilitate the clinician's understanding of the client's lifetime use.

Purpose of the Current Study. The purpose of the present study was to investigate the reliability and validity of the scores derived from the InDUC-2L (Miller et al., 1995), to expand the measure's dichotomous scale, and to determine the impact of expanding the measure's dichotomous scale on the instrument's psychometric properties. Because only one study has examined the measure's validity, this study sought to examine the relationships between the original and revised versions of the InDUC-2L and four other measures: the Fifth Edition of the *Addiction Severity Index* (ASI; Appendix D; McLellan et al., 1992), the *Coping Responses Inventory- Adult Form* (CRI-A; Appendix E; Moos, 1993), the *Derogatis Stress Profile* (DSP; Appendix F; Derogatis, 1987), and the *Stages of Change Readiness and Treatment Eagerness Scale* (both the alcohol and drug versions; Appendices G and H; Miller & Tonigan, 1996). The hypotheses for the present study are listed below and described in more detail in Chapter III.

Hypotheses

Addiction Severity Index

1. The types of problems endorsed on the revised version of the InDUC-2L will be similar to the problems endorsed on the ASI.
2. The revised version of the InDUC-2L will be more strongly related to the ASI than the original version of the InDUC-2L.

Coping Responses Inventory

3. Those who use an "Avoidance Coping Response" will have experienced more consequences associated with their substance use throughout their lives than those who use an "Approach Coping Response".
4. The revised version of the InDUC-2L will be more strongly related to the

CRI-A than the original version of the InDUC-2L.

Derogatis Stress Profile

5. Those who report more stressors will have experienced more consequences associated with substance use throughout their lives than those individuals who report fewer stressors.
6. The revised version of the InDUC-2L will be more strongly related to the DSP than the original version of the InDUC-2L.

Stages of Change Readiness and Treatment Eagerness Scale

7. Those who experience more (fewer) consequences associated with their substance use may be more (less) likely to recognize they have a problem with drinking or using drugs.
8. Those who experience more (fewer) consequences associated with their substance use may report taking more (fewer) steps to change their alcohol and drug use.
9. Those who experience more (fewer) consequences associated with their substance use may be less (more) likely to feel ambivalent about whether they have a problem.
10. The revised version of the InDUC-2L will be more strongly related to the Alcohol and Drug Versions of the SOCRATES than the original version of the InDUC-2L.

Definition of Terms

Assessment: An ongoing process through which the counselor collaborates with the client and others to gather and interpret the necessary information for

treatment planning and evaluating client progress (SAMHSA, 2002). Assessment procedures are designed to explore more fully the nature and extent of a person's problems with substances and to determine whether the individual meets criteria for a particular diagnostic category (Allen & Wilson, 2003). Assessment differentiates from screening in that screening is the process through which the counselor, client, and available significant others determine the most appropriate initial course of action, given the client's needs and characteristics, and the available resources within the community (SAMHSA, 2002). Additional definitions of assessment and screening, including the purpose and importance of these procedures, are described in more detail in Chapter II.

Illicit Drugs: According the to NSDUH (SAMHSA, 2005), illicit drugs include marijuana or hashish, cocaine (including crack), inhalants, hallucinogens (including phencyclidine [PCP], lysergic acid diethylamide [LSD], and Ecstasy [MDMA]), heroin, or prescription-type psychotherapeutics used non-medically, which include stimulants, sedatives, tranquillizers, and pain relievers. The term "illicit drug use" refers to use of any of these drugs.

Likert-Type Scale: A type of scale that asks respondents to indicate their level of agreement using a declarative statement (i.e., disagree, strongly disagree or strongly agree); or the degree or extent to what is expressed in the statement is true of a belief, attitude, or characteristic of the respondent (i.e., not at all to very much); or the frequency of behavior (i.e., never to always) (Netemeyer, Bearden, & Sharma, 2003).

Screening: The process through which the counselor, client, and available