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Assessment Issues in Adolescent Drug Abuse Treatment Research

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Abstract. Experimentation with alcohol and other drugs (AOD) is commonplace among American adolescents. Despite reduction efforts, the use of AOD by adolescents has increased over the past decade. A number of youth experience significant negative personal, societal, economic, and health ramifications, but continue to abuse AOD and develop substance use disorders (SUD). Accurate assessment of adolescent AOD use is essential in determining the prevalence of SUDs, the development of effective interventions, and the implementation of beneficial prevention initiatives. Developmental considerations are significant factors in the validity of youth AOD assessment and are detailed in this chapter.

1. Introduction

Adolescent use of alcohol and other drugs (AOD) is seemingly omnipresent and may be part of the "normal developmental trajectory for adolescents" (Shedler & Block, 1990). The National Institute on Drug Abuse (NIDA), in collaboration with Monitoring the Future, reported that despite a reduction or stabilization of the use of some drugs, a rise in AOD use among American adolescents since 1992 is largely evident (Johnston, O'Malley, & Bachman, 2003). Of 43,000 students surveyed, over one-third of eighth graders and three-quarters of twelfth graders drank in the past year. In regards to prior month usage, 19.6% of eighth graders and 48.6% of twelfth graders reported consuming alcohol.

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Beyond experimentation, adolescent AOD use behaviors can progress to a substance abuse or dependence disorder. Of 74,000 students surveyed in Minnesota who used AOD over the past year, 13.8% of ninth graders and 22.7% of twelfth graders met substance abuse criteria (Diagnostic and Statistical Manual of Mental Disorders-IV; DSM-IV; Harrison, Fulkerson, & Beebe, 1998). In this same study, 8.2% of ninth graders and 10.5% of twelfth graders met criteria for substance dependence. Data from the recent National Survey on Drug Use and Health revealed that of 12–17 year olds, eight percent of this extensive epidemiological sample met criteria for either substance abuse or dependence (Substance Abuse and Mental Health Services Administration; SAMHSA, 2001).

Personal, as well as societal, ramifications of adolescent drug abuse are profound. School failure, risky sexual behavior (MacKenzie, 1993), delinquency, incarceration, suicidality (Kaminer, 1994; Shedler & Block, 1990), motor vehicle injuries/fatalities (Kokotailo, 1995), and significant health care costs (DAWN, 1996) are all highly correlated with adolescent AOD use. Accurate assessment of adolescent AOD use is therefore crucial to understanding the prevalence, proliferation, and exacerbation of teen substance abuse and ensuing treatment and prevention initiatives. The following chapter will outline the issues surrounding the assessment of adolescent AOD use and substance use disorders (SUD). Specifically, the chapter will discuss developmental considerations of AOD use; the types of instruments in the field; key AOD problem severity and psychosocial factors measured by instruments in the field; and methods and sources of data collection.

2. Developmental Considerations in AOD Use Assessment

Pediatricians and general practitioners have come to understand and emphasize the complexities involving the physical health assessment and treatment of adolescents. Issues regarding physical, cognitive, and emotional development, confidentiality, and emerging reproductive health are factors that differentiate adolescent physical health care from child and adult prevention and intervention initiatives. Like physicians, mental health professionals can benefit from applying developmental considerations to the psychological domains that pertain to the accurate assessment and treatment of adolescent drug abuse and much needed prevention initiatives.

Unfortunately, the foundation for AOD use disorders is rooted in longstanding beliefs centered around adult characteristics; thus, the applicability to adolescents has been questioned (Martin & Winters, 1998). Whereas much is known about factors involving adult use and SUDs, research reveals that adolescents manifest behavioral, psychological, and physiological characteristics differently than adults (Kaminer, 1991). For example, patterns of use differ between the age groups, as does the development of an SUD. We discuss below seven significant developmental dimensions of adolescent AOD involvement that require attention in the assessment process.

2.1. *AOD Involvement*

We begin with the important issue of adequately distinguishing normative and developmental roles played by drug use in this age group. It is difficult to determine when adolescent drug use has negative long-term implications versus short-term effects and social payoff. In a strict sense, a "normal" trajectory for adolescents is to experiment with the use of psychoactive substances. As described in the seminal work by Kandel and colleagues (Kandel, 1975; Yagamuchi & Kandel, 1984), experiences by adolescents with substance use most often first take place in a social context with the use of "gateway" substances such as alcohol and cigarettes, which are legal for adults and readily available to minors. While almost all adolescents experiment with gateway drugs, progressively fewer of them advance to later and more serious levels of substance use, including the use of marijuana and other illicit drugs (Kandel, 1975). Moreover, the presence of some abuse symptoms is not all that rare among adolescents who use substances, even if not at heavy levels (Harrison et al., 1998). Also, it has been observed that moderate alcohol users reveal relatively high rates of personal consequences associated with such use (Kaczynski & Martin, 1995).

Thus, it is important to conceptualize AOD use along a continuum. Center for Substance Abuse Treatment (CSAT, 1999) offers this continuum for heuristic purposes: 1) *Abstinence;* 2) *Experimental Use:* Minimal use, typically associated with recreational activities; often limited to alcohol use; 3) *Early Abuse:* More established use; often involving more than one drug; greater frequency; adverse consequences begin to emerge; 4) *Abuse:* Regular and frequent use over an extended period; several adverse consequences emerge; 5) *Dependence:* Continued regular use despite repeated severe consequences; signs of tolerance; adjustment of activities to accommodate drug-seeking and drug use; failed attempts to reduce or discontinue use.

Early, accurate, and ongoing assessment of adolescent AOD use is important in distinguishing typical use from problematic AOD use behaviors. Unfortunately, there are several factors that make this challenging. Of significant concern is the fact that AOD use can progress rapidly from experimentation to abuse or dependence for teens. Martin and colleagues (1995) reported that some adolescents can be diagnosed with abuse or dependence in as little as 12 months after their initial use. This is in contrast to adults whereby the development of an SUD typically takes much longer. Furthermore, it has been documented that teens often underestimate or ignore severe potential consequences. A growing evidence of health outcomes are often minimized (Lewinsohn, Rohde, & Seeley, 1996) while teens engage in a risky lifestyle riddled with significant AOD use that they inaccurately feel they can control (Botvin & Tortu, 1988). Other factors that may hinder early assessment include the common adolescent that reveal lack of respect for authority, are egocentric, and carryout risk-taking behaviors. Moreover, adolescents demonstrate delays in social and emotional functioning (Noam & Houlihan, 1990) and may lack the necessary insight to accurately report their use of AOD (Winters, 2001).

Despite these obstacles, there are several AOD use behaviors that are associated with the likelihood of progression toward the end of the AOD use continuum. Perhaps none is more predictive than age of onset. It has been replicated many times in studies that the earlier the use, the greater likelihood that an adolescent will progress toward abuse and dependence (Winters, 1994). Additional important factors to consider include: a) regular use of a drug increases the likelihood of development an SUD; b) polydrug assessment is crucial because the use of more than one drug increases the odds of meeting criteria for an SUD for one of the used drugs (Winters, 1994); c) preadolescent cigarette use predicts early adolescent marijuana use (Clark, Kirisci, & Moss, 1998) and; d) marijuana use during early adolescence predicts the progression of involvement with other illicit substances (Kandel & Davies, 1996).

2.2. *Abuse and Dependence*

AOD use that goes beyond experimentation and evolves into problematic involvement is formally delineated by the DSM-IV (1994) into two categories: *abuse* and *dependence.* Substance abuse is characterized by negative health and social consequences whereby one or more of the following are endorsed: a) school, home, or work status is compromised; b) substances are used in physically hazardous situations (e.g., driving under the influence); c) recurrent substance-related legal problems; and d) exacerbation of social and interpersonal problems due to AOD use. Whereas abuse symptoms are expected to be associated with clinically significant impairment or distress, they are meant to occur prior to and fall short of dependence symptoms on a severity spectrum. The method is variably successful in fulfilling these intentions (Martin & Winters, 1998).

In contrast to abuse, psychological and physiological factors play a substantial role in the life of an individual who meets criteria for substance dependence. These people continue to use AOD despite significant negative psychosocial ramifications while biological factors cause significant health consequences. Specifically, criteria for dependence is met if an individual meets three or more of the following: a) an individual either requires more of a substance for a similar effect or experiences a reduction in the effect produced by the use of the same amount of a substance (tolerance); b) withdrawal symptoms are experienced (e.g., shakes, dizziness, confusion, etc.); c) larger quantities of the substance are taken or it is used for longer periods than intended; d) efforts to cut down or control use are unsuccessful; e) substantial amount of time is spent getting, using, or recovering from use; f) leisure activities are reduced or eliminated; and g) use of AOD is continued despite the knowledge that it may have caused or exacerbated physical or psychological problems. In DSM-IV, substance abuse and substance dependence are mutually exclusive, and the diagnoses of abuse and dependence are hierarchically arranged (i.e., a dependence diagnosis precludes an abuse diagnosis).

The applicability of SUD criteria for the adolescent developmental period has been called into question (Martin & Winters, 1998). There is evidence that symptoms of abuse do not always precede symptoms of dependence, contrary to the notion that abuse should be a prodromal category with respect to dependence (Martin, Kacyzniski, Maisto & Tarter, 1996). Some adolescents as well as adults "fall through the cracks" of the DSM-IV system. That is, some individuals meet criteria only for one or two of the seven dependence symptoms (three or more symptoms are required for a diagnosis), and no abuse symptoms, and therefore do not qualify for any diagnosis (Hasin & Paykin, 1998; Pollock & Martin, 1999). These "diagnostic orphans" have been found to range from 10–30% among adolescents in clinical settings (Lewinsohn et al., 1996; Harrison et al., 1998; Pollock & Martin, 1999).

In addition to the diagnostic orphans, other questionable applications of SUD criteria arise in the assessment of adolescent AOD use. One such application is an important criteria for dependence, tolerance, which appears to have low specificity because the development of tolerance for drugs is likely a normal developmental phenomena which happens to most adolescents; this is particularly the case for alcohol (Chung, Martin, Winters, & Langenbucher, 1991). Withdrawal has limited utility because it occurs at very low base rates in the adolescent population, even in clinical samples (Martin et al., 1995; Winters, Latimer, & Stinchfield, 1999). Also, the criteria for DSM-IV substance abuse produces a great deal of heterogeneity because these symptoms cover a broad range of problems and only one symptom is required to meet the criteria.

Nonetheless, the application of formal diagnostic criteria for youth clinical samples is necessary in several settings, such as when researchers need to categorically describe their study participants in a language familiar to other researchers, and when clinicians have to assess and record a valid diagnosis to justify the need for treatment. Fortunately, several comprehensive structured and semi-structured interviews for evaluating SUDs have been developed for use with adolescent populations (CSAT, 1999). Further discussion pertaining to the tools utilized in adolescent AOD assessment is outlined later in this chapter.

2.3. *Psychological Benefits*

One factor that may entice adolescents to experiment with AOD involves the psychological benefits they may receive from substance use. Social acceptance, elevated mood, recreational enjoyment, and stress reduction are all outcomes adolescents may experience from AOD use (Petraitis, Flay, & Miller, 1995). An important finding in one study revealed that of these psychological benefits, social conformity and mood enhancement were found to be more important to adolescents who have a substance use dependence disorder than to those who use AOD infrequently (Henly & Winters, 1988). The impact these psychological benefits may have on the allurement and exacerbation of AOD use among adolescents emphasizes the importance of effective prevention and early intervention efforts. These initiatives need to underscore the detrimental psychological

and physical ramifications AOD use can have on teens in an attempt to outweigh the enticing benefits substance use appears to have on youth.

2.4. *Psychosocial Factors*

Contrary to the benefits adolescents may experience from AOD use, they can also can experience numerous psychosocial ramifications. Measurement of these dimensions provides beneficial information regarding the extent of the AOD use, aids in treatment planning, and provides data to monitor treatment efficacy. The protocol should include the assessment of an adolescent's history of legal problems, evidence of deteriorated relationships with family and friends, status of school and employment experiences (e.g., dropping grades, suspension, being fired), extent of sexual promiscuity, and quality and quantity of leisure or extracurricular activities.

Peer issues are often recognized as one of the most important psychosocial factors in the onset and maintenance of AOD use. Peer influence has been a factor in the quantity of AOD consumed as well as in the types of substances used. Higher rates of AOD use were found among adolescents whose friends used substances compared to those who friends did not (Farrell & Danish, 1993; Winters, Latimer, Stinchfield, & Henly, 1999). Guo and colleagues (2002) found that high levels of peer involvement with antisocial behavior predicted higher risk of initiation of illicit drug use among adolescents. Other researchers found a nearly 6-fold increase in drug use risk among children who associated with peers who used drugs verses those who did not (Chilcoat & Breslau, 1999). Additional factors related to peer influences on adolescent AOD use include peer attitudes and expectancies pertaining to substance use, and peer attachment (Dishion, Capaldi, Spracklen, & Fuzhong, 1995; Hawkins, Catalano, & Miller, 1992; Patterson, Forgatch, Yoerger, & Stoolmiller, 1998). Understanding the complexities involved in the specific aspects by which peers influence adolescent AOD is most likely complex, nonetheless. In fact, a culturally diverse, three-year study of over 6,000 sixth through ninth grade youth reported a bidirectional relationship between levels of adolescents' alcohol use and levels of alcohol use among their peers (Bray, Adams, Getz, & McQueen, 2003).

2.5. *Co-existing Mental Health Disorders*

Adolescents who are involved with AOD often have co-existing psychological disorders (Clark & Bukstein, 1998). Rohde and colleagues (1996) reported that among adolescents who were either abusing or dependent on alcohol, 80 percent also had some other form of psychopathology. Therefore, AOD use assessment should not only address the problems the teen is experiencing with alcohol and other drugs, but also identify comorbid psychiatric disorders. Doing so may be a key element in the projected success of an SUD intervention and subsequent relapse prevention.

Mental health disorders that commonly co-occur with SUDs in adolescents include ADHD, conduct disorders, depressive disorders, and anxiety disorders. Some researchers have found ADHD to be predictive of AOD use and related problems (Mannuzza, Klein, Blessler, Malloy, & LaPadula, 1993; Milberger, Beiderman, Faraone, Chen, & Jones, 1997). Some controversy over this association exits however, for other studies have found that conduct disorder comorbid with ADHD was the mediating factor that predicted AOD use or abuse (Biederman, Wilens, Mick, Farone, Weber, Curtis, Thornell, Pfister, Jetton, & Soriano, 1997; Clark, Parker, & Lynch, 1999; Lynskey & Fergusson, 1995). Yet others have found an independent correlation between ADHD and SUD beyond that attributed to conduct disorder (Thompson, Riggs, Mikulich, & Crowley, 1996). Determining the independent or conjoint impact ADHD and conduct disorder has in regards to the onset of AOD misuse for adolescents remains unclear and further research is needed.

In addition to disruptive behavior disorders, mood disorders such as depression and anxiety have been found to be correlated with AOD disorders. Clark & Sayette (1993) reported that emotional dysregulation, which is associated with depression and anxiety, may pose risk factors associated with AOD use disorders. Other studies reported that early use of alcohol was found to significantly predict later major depressive disorder (Brook, Brook, Zhang, Cohen, & Whiteman, 2002), diagnosis of an SUD was predictive of later major depressive disorder in adolescents females, (Rao, Daley, & Hammen, 2000) and adolescents with an SUD reported higher rates of affective disorders and sympotmology, especially for females (Deykin, Levy, & Wells, 1987; Martin, Lynch, Pollock, & Clark, 2000).

Clearly, causal relationships between SUDs and psychological disorders are yet to be fully during determined. Thus, it is vital to consider the potential influences of both SUDs and other psychological disorders during assessment. Of importance is the need to carefully pinpoint the onset and course of possible psychological symptoms and differentiating these behaviors from the onset and course of AOD involvement and resultant symptoms of abuse and dependence. A carefully constructed, temporally-oriented interview is necessary in order to validly distinguish bonafide symptoms of psychological disorders and the mental and behavioral effects of AOD involvement (Winters, 1994).

2.6. *Family Factors*

Another developmental element associated with adolescent AOD use is that of familial risk factors. These parental risk factors involve both genetic and environmental characteristics that elevate a child's risk for AOD use. Parental modeling of drinking and drug use can be powerful catalysts for adolescent SUD (Moss, Clark, & Kirisci, 1997). McGue (1999) reported that children whose parents suffered from an SUD were at increased risk for the development of an SUD. Furthermore, parental psychopathology can also exacerbate risk for early

and problematic drug use by teens (Rose, 1998). Researchers have also reported higher rates of affective disorders and related symptomology in children of parents who had an SUD (Clark, Moss, Kirisci, Mezzich, Miles, & Ott, 1997; Earls, Jung, & Cloninger, 1988; Hill & Muka, 1996). Finally, antisocial behavior and related disorders are commonly found in children whose parents had an SUD (Clark et al., 1997; Earls et al., 1988; Zucker, Fitzgerald, & Moses, 1995).

2.7. *Neurobiology*

AODs do more than affect the behavior of adolescents; they also have a direct impact on brain functioning in the young person. The adolescent brain, by not being fully developed until early adulthood (e.g., some parts of the brain undergo 50% transformations during adolescence) is vulnerable to the effects of AOD. For example, adolescents with a history of extensive alcohol use have been reported to have a smaller hippocampus, the brain region responsible for converting information into memory, and to reveal memory deficits and other neuropsychological impairments resulting from reduced brain activation during memory tasks (Spear, 2000). Work in laboratory animals provides confirming evidence that adolescent exposure to drugs can influence later neural behavioral functioning. For instance, alcohol exposure during adolescence has been shown to result in long-term disruptions in brain electrical activity in the hippocampus and in other brain areas. After chronic exposure during adolescence, rats have been reported to exhibit greater cognitive disruptions and a greater sensitivity to later alcohol-induced memory disruptions than animals receiving equivalent exposure in adulthood (Markwiese, Acheson, Leven, Wislosn, & Swartzwelder, 1998).

Research using laboratory animals has also shown adolescents to differ considerably from adults in their initial responsiveness to alcohol. Adolescent rats show a *decreased* sensitivity to the adverse effects of alcohol when compared to older rats. Adolescent rats also appear to require a higher initial amount of alcohol to reduce anxiety then to adults (Varlinskaya & Spear, in press). These findings, which suggest that adolescent rats are less sensitive to alcohol than mature individuals, serve to promote higher alcohol consumption. That is, moderation in drinking by adults occurs as the individual experiences the compounding adverse effects of alcohol. The decreased sensitivity to alcohol in adolescents would, therefore, minimize the dampening effect that serves to alert the user that he or she is intoxicated.

3. Basic Instruments for Determining AOD Involvement and Related Problems

Significant contributions by researchers over the past decade have provided clinicians and researchers with numerous instruments to accurately

assess adolescent drug use behaviors (Lecesse & Waldron, 1994). Many measures have been normed on adolescents of varying ages, are limited in length, and written conducive to young people's comprehension levels. Some tools are designed to quickly identify youth at risk for AOD problem behavior, while the purpose of other measures is to provide extensive information that allows diagnostic assessment of SUD as well as other coexisting psychiatric disorders. A summary of several adolescent screening and comprehensive assessment measures is provided in Table 1. Inclusion in the table required that the instrument was developed specifically for adolescents and that its psychometric properties has been reported in a peer-reviewed publication. Several extensive summaries of such measures are available via web sites, such as the Screening Assessment of Adolescents with a Substance Use Disorder (Treatment Improvements Protocol Series: TIPS #31) (CSAT; www.samhsa.gov/csat/csat.htm) and the National Institute on Drug Abuse (NIDA; www.nida.nih.gov). Printed reviews of adolescent AOD assessment measures included journal articles (Lecesse & Waldron, 1994; Martin & Winters, 1998), and chapters in a handbook (Winters, 2001).

3.1. *Screening Measures*

A wide range of school personnel, health professionals, clinicians, and researchers can benefit from screening instruments that quickly and accurately identify adolescents who may be abusing AOD and may be at risk for developing a SUD. These screening tools are typically administered in a self-report paper-pencil format and can measure a single dimension or briefly assess multiple areas of risk. Screening instruments can be organized into four categories: alcohol use only, non-alcohol drug use, non-specific drug use including alcohol, and "multi-screen." Instruments in the latter category, in addition to AOD involvement, quickly survey a teenager's level of functioning in areas such as fulfillment of educational goals, recreational activities, social skill development, delinquent behavior, physical health, and relationships with family and peers.

3.2. *Comprehensive Measures*

In contrast to the brief screening instruments, comprehensive measures provide a thorough evaluation of multiple domains and can clarify status on indicators that were flagged on screening instruments. Comprehensive measures not only render extensive information pertaining to the types of AOD used, the pattern of use, and extent of drug involvement, but also ascertain information on the psychosocial factors that may precipitate, exacerbate, and sustain AOD use problems. Comprehensive measures can be organized into three categories: diagnostic interviews, problem-focused interviews, and multi-scale questionnaires, all of which are detailed below.

Diagnostic Interviews. These DSM-based tools typically adhere to a structured format whereby the administrator uses standardized questions and follow-up queries guided by a decision tree configuration. The individual conducting the interview should be thoroughly trained in the administration of the measure, as well as have adequate knowledge in psychopathology. While some of the diagnostic interviews are developed for the adolescent client, others are designed for the parent. These interviews ascertain diagnostic information pertaining to multiple psychological domains including AOD abuse and dependence.

Problem-Focused Interviews. In contrast to the diagnostic interview, the problem-focused interview not only measures AOD use history but also addresses the ramifications of AOD use and other aspects of psychosocial functioning that may perpetuate or exacerbate AOD use. Relationships with parents and peers, leisure activities, school and employment status, involvement with criminal or other rebellious activity against authority, and medical status are assessed by this type of comprehensive measure. The problem-focused interview was adapted from the well-known adult Addiction Survey Index (ASI; McLellan, Luborsky, Woody, and O'Brien, 1980). These measures typically utilize a severity rating scale to indicate the extent to which the client is experiencing problems associated with each domain.

Multi-scale Questionnaires. The third type of comprehensive measure is the multi-scale questionnaire. These self-administered measures assess the severity of drug use involvement and the psychosocial risk factors associated with AOD use. Although administration time ranges in length from 20 to 60 minutes, multi-scale questionnaires are easily administered by individuals with minimal training, can be completed by hand or via the computer, and some even have the benefit of computerized scoring. In addition, many of these tools provide methods for determining inconsistent or distorted responses, are normed on a clinical sample, can be scored via the computer, and maintain favorable psychometric properties (Winters, 2001)

3.3. *Assessment of AOD Use Patterns*

An accurate historical account of all categories of substance use can be difficult to ascertain from screening or comprehensive measures. The Time Line Follow-back (TLFB) method is a useful approach for documenting AOD use patterns. Sobell and Sobell (1992) developed this tool that employs a day-by-day account of alcohol use over the past year. Rather than lumping AOD use into time frames such as a year or a month as other measures do, the TLFB allows a more accurate chronological assessment of an individual's use and is beneficial in illustrating drug use patterns. Fairly extensive reliability and validity data for this method has been reported in the adult literature (Sobell & Sobell, 1992), and more recently psychometric data has supported its use with adolescents (Winters, 2001).

4. Methods of Data Collection and Sources of Information

There are several types of data collection that when combined, can provided a thorough and accurate account of a young person's AOD use history. Parents, peers, professionals and adolescents themselves can all contribute important information that will assist in determining whether an SUD is present.

4.1. Self-Report

The approach that renders the most comprehensive information pertaining to an adolescent's AOD use experiences is self-report. However, the validity of self-report has been called into question by a number of researchers. Some adolescents in clinical and legal settings have been found to deliberately minimize or exaggerate their drug use behaviors (Babor, Stephens, & Marlatt, 1987; Harrison, 1995; Magura & Kang, 1997). In addition, inconsistent reports of drug use pertaining to substances that were used infrequently by adolescents were found by Single, Kandel, & Johnson (1975). Stinchfield (1997) recognized that adolescents completing treatment for AOD dependence generally reported considerably more past AOD use and consequences compared to reports at the start of intervention.

Despite these concerns, a substantial amount of research does support the use of self-report as a valid and accurate measure for adolescent AOD assessment. Four major findings supporting the validity include: a) only a very small proportion of teenagers in treatment endorse questions that are highly improbable such as the use of a fictitious drug; b) the majority of youth endorse the use of illicit drugs on surveys, and youth in drug treatment settings endorse the use of drugs at a significantly higher rate than those not in a treatment setting; c) adolescent account of drug use remains consistent over time (however, this is less so for drugs used infrequently) and; d) information provided by the adolescent as a rule is in agreement with corroborating sources of information including archival record and, for the most part, urinalysis (Johnston & O'Malley, 1997; Maisto, Connors, & Allen, 1995; Winters, Anderson, Bengston, Stinchfield, & Latimer, 2000; Winters, Stinchfield, Henly, & Schwartz, 1990–91). Furthermore, two factors have been shown to improve the validity of self-report: the assurance of confidentiality (Harrell, 1997) and the utilization of urinalysis (Wish, Hoffman, & Nemes, 1997).

4.2. Laboratory Testing

The type of laboratory testing most familiar to researchers and clinicians to detect AOD use and validate self-report is urinalysis. The utility in the identification of drugs in the urine, particularly THC found in marijuana and hashish, can be beneficial. The most valuable aspect of urinalysis however, may not be so much the identification of drugs in the urine, but rather may lie

in the message the administration of the test sends regarding a means of "revealing the truth" (CSAT, 1999).

Unfortunately, urinalysis is riddled with inaccuracies. Researchers have generally found a low correlation between adolescent self-report of AOD use and urinalysis (McLaney, Del-Boca, & Babor, 1994). Factors including quantity of drug used, time between sample collection and use of drug, alteration of the output with the ingestion of diuretics or water, adding large quantities of salt to the sample, and the use of some over-the-counter medications all contribute to inaccurate results (CSAT, 1999). A sample that has shown dilutement or high salt content, however, can provide valuable information in and of itself by sending a clear message to the clinician, employer, or researcher that the sample has been adulterated, indicating a possible attempt to conceal the truth.

4.3. Direct Observation

In addition to self-report and urinalysis, direct observation by a clinician or researcher for behavioral and psychological symptomology can be an objective and useful supplement to adolescent AOD use assessment. A simple checklist of items such as the presence of needle marks, unsteady gate, slurred or incoherent speech, shaking of hands or twitching of eyelids, etc., can indicate problem use.

4.4. Parent Report

Although parent report is critical in the identification of many mental health problems such as ADHD and conduct problems, it is not possible for parents to provide the detailed reports about the types, frequency, and quantity of AODs used by the teenager necessary for accurate SUD assessment. Winters and colleagues (2000) found, not surprisingly, that parents tended to underreport the extent to which their adolescent child experimented with AOD. Parental reports may be helpful however, in providing valuable information on risk factors associated with SUDs such as medical history, family environment, and psychosocial stressors that may have contributed to the AOD use status of the adolescent and impact subsequent treatment outcome.

4.5. Peer Report

Although not crucial, collecting information from friends could prove to be a valuable resource especially if the peers are not currently using AOD or are in recovery. Peers may be able to detail a change in an adolescent's recent behavior or provide information substantiating the drug use behaviors in which they had witnessed or collaboratively participated.

4.6. *Archival Records*

Data collected from sources other than family and friends can help to document the severity of an adolescent's AOD use and outline the consequences of use the teen has experienced. Following client consent, obtaining information from government documents, school data, police reports, employment files, medical records, and other data that document behaviors such as noncompliance with authority, can augment self-report data and clarify important assessment and treatment information. In addition, archival record information can provide beneficial information useful in the development of treatment initiatives and subsequent recovery maintenance.

4.7. *Additional Assessment Issues*

Assessment of AOD involvement is multifacited and can be enhanced by the utilization of some additional factors. It is beneficial to clearly identify the specific categories of drugs used by the teen such as beer, hard liquor, crack, crank, and especially the currently popular "club drugs" such as Ecstacy, Rohypnol, and GHB. With this, interviewers need to have thorough knowledge of all drug categories and the numerous slang terms young people use to reference the various drugs. Furthermore, in order to increase the accuracy in the documentation of amount of alcohol used, it is important to utilize standardized units of measurement such as one drink equals a 12 oz. glass of beer, a four oz. glass of wine, or one oz. of hard liquor (Martin & Nirenberg, 1991). Furthermore, for marijuana and some of the other illicit drugs, the utilization of non-standardized units of measurement can also be helpful to understand the general quantity and progression of use (i.e., hit, joint, blunt, gram, etc.). Finally, issues that should also be addressed during AOD assessment pertain to the age at which the adolescent first used each substance regularly, (e.g., on a monthly basis), how frequently each substance is used in a particular period (e.g., evening, 24 hours, weekend), and the number of months or years the individual has used each of the substances.

5. Assessment of Outcomes

Drug treatment programs have generally received intensive scrutiny, perhaps more so than other healthcare services, because of the nature of addiction and the visibility of its effects. Adolescent drug treatment programs and models have recently been subject to similar scrutiny (Williams and Chang, 2000; Winters, 1999). Treatment outcome information is thus invaluable to the field; such documentation provides a clearer picture of the types of clients served and helps programs determine the effectiveness and cost offsets of different strategies, and improve program performance. Many of the standardized instruments included in Table 1 are worthy of consideration as an appropriate

tool when measuring treatment outcome. What parameters are relevant when choosing outcome measures? Newman, Ciarlo, and Carpenter (1999) enumerated eleven guidelines for instrument selection and they are listed below:

1. Relevance to target group
2. Simple, teachable methods
3. Use of measures with objective referents
4. Use of multiple respondents
5. More process-identifying outcome measures
6. Psychometric strengths
7. Low measure costs relative to its uses
8. Understanding by nonprofessional audiences
9. Easy feedback and uncomplicated interpretation
10. Useful and clinical services
11. Compatibility with clinical theories and practices

The value of any standardized questionnaire as a measure of change is an important statistical and clinical question (Collins & Horn, 1991). Some investigators use difference scores, but they tend to be less reliable than the scores used to compute them, and the value of the Time-1 score introduces a bias into the difference score calculation (Allen & Yen, 1979). Dividing the simple difference score by the Time-1 score provides a partial correction for this bias. From a clinical standpoint, the important question is how many clients got better, how many got worse, and how many did not change. Along these lines, Jacobson and Truax (1991) have proposed using the concept of "clinically significant change," which refers to a score change from the abnormal to the normal range. They have statistically operationalized this concept with the Reliable Change Index (RCI). The RCI yields a change score that is corrected for the amount of measurement error inherent in the instrument. This is done by computing the difference between pre-test and post-test scores and dividing by the standard error of difference for the measure (which is estimated from the measure's temporal stability). We regard the RCI analysis as quite appealing because it addresses the practical needs of the treatment service provider while still maintaining statistical standards of significance. Thus, it can be argued that for an instrument to have utility as an outcome measure, it must demonstrate satisfactory measurement error and provide meaningful information to treatment providers and researchers.

6. Summary

Adolescents use and abuse AOD at an alarming rate in this country and experience devastating consequences because of it. AOD use also has a substantial impact on society as well. Therefore, it is critical to quickly and accurately identify those adolescents who are abusing AOD and possibly suffering

from an SUD. Distinguishing adult SUD assessment from youth assessment is very important and therefore, developmental considerations are among the most significant factors that need to be considered in the assessment of adolescent AOD use/abuse. Fortunately, research over the past decade has provided health professionals, school personnel, and clinicians with various tools to properly identify those teens who may abusing AOD and suffer from a SUD. However, continued research in the assessment field is still necessary to further improve the their validity of tools for identification, referral, and treatment of adolescent AOD involvement.

References

Allen, M. J., & Yen, W. M. (1979). *Introduction to measurement theory.* Monterey, CA: Brooks/Cole.

American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC.: Author.

Babor, T. F., Stephens, R. S., & Marlatt, G. A. (1987). Verbal report of methods in clinical research on alcoholism: Response bias and its minimization. *Journal of Studies on Alcohol, 48,* 410–424.

Biederman, J., Wilens, T., Mick, E., Farone, S. V., Weber, W., Curtis, S., Thornell, A., Pfister, K., Jetton, J. G., & Soriano, J. (1997). Is ADHD a risk factor for psychoactive substance use disorders? Findings from a four-year prospective follow-up study. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 21–29.

Botvin, G. J., & Tortu, S. (1988). Peer relationships, social competence, and substance abuse prevention: Implications for the family. In R. H. Coombs (Ed.), *The family context of adolescent drug use* (pp. 245–273). New York, NY: Haworth Press.

Bray, J., Adams, G., Getz, G., & McQueen, A. (2003). Individuation, peers, and adolescent alcohol use: A latent growth analysis. *Journal of Consulting and Clinical Psychology, 71*(3), 553–564.

Brook, D. W., Brook, J. S., Zhang, C., Cohen, P., & Whiteman, M. (2002). Drug use and the risk of major depressive disorder, alcohol dependence and substance use disorders. *Archives of General Psychiatry, 59* (11), 1039–1044.

Center for Substance Abuse Treatment. (1999). Screening and assessing adolescents for substance use disorders. *Treatment Improvement Protocol (TIP) Series #31.* Rockville, MD: Substance Abuse and Mental Health Services Administration.

Chilcoat, H., & Breslau, N. (1999). Pathways from ADHD to early drug use. *Journal of the American Academy of Child & Adolescent Psychiatry, 38*(11), 1347–1354.

Chung, T., Martin, C. S., Winters, K. C., & Langenbucher, J. W. (2001). Assessment of alcohol tolerance in adolescents. *Journal of Studies on Alcohol, 62,* 687–695.

Clark, D. B., & Bukstein, O. G. (1998). Psychopathology in adolescent alcohol abuse and dependence. *Alcohol Health & Research World, 22*(2), 117–121.

Clark, D. B., Kirisci, L., & Moss, H. B. (1998). Early adolescent gateway drug use in sons of fathers with substance use disorders. *Addictive Behaviors, 23,* 561–566.

Clark, D. B., Moss, H., Kirisci, L., Mezzich, A. C., Miles, R., & Ott, P. (1997). Psychopathology in preadolescent sons of substance abusers. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 495–502.

Clark, D. B., Parker, A., & Lynch, K. (1999). Psychopathology and substance-related problems during early adolescence: A survival analysis. *Journal of Clinical Child Psychology, 28,* 333–341.

Clark, D. B., & Sayette, M. A. (1993). Anxiety and the development of alcoholism: Clinical and scientific issues. *The American Journal on Addictions, 2,* 59–76.

Collins, L. M., & Horn, J. L. (Eds.) (1991). *Best methods for the analysis of Change.* Washington, DC: American Psychological Association.

DAWN (Drug Abuse Warning Network). (1996). *1996 DAWN report.* Washington, D.C.: Substance Abuse and Mental Health Services Administration.

Dennis, M.L. (1999). *Global Appraisal of Individual Needs (GAIN): Administration Guide for the GAIN and Related Measures.* Bloomington, IL: Lighthouse Publications.

Deykin, E. Y., Levy, J. C., & Wells, V. (1987). Adolescent depression, alcohol and drug abuse. *American Journal of Public Health, 77,* 178–182.

Dishion, T. J., Capaldi, D., Spracklen, K. M., & Fuzhong, L. (1995). Peer ecology and male adolescent drug use. *Development and Psychopathology, 7,* 803–824.

Earls, F., Reich, W., Jung, K. G., & Cloninger, C. R. (1988). Psychopathology in children of alcoholic and antisocial parents. *Alcoholism: Clinical and Experimental Research, 12,* 481–487.

Farrell, A. D., & Danish, S. J. (1993). Peer drug associations and emotional restraint: Causes and consequences of adolescents' drug use? *Journal of Consulting and Clinical Psychology, 61,* 327–334.

Friedman, A.S., & Utada, A. (1989). A method for diagnosing and planning the treatment of adolescent drug abusers. Adolescent drug abuse diagnosis instrument. *Journal of Drug Education,* 19: 285–312.

Grisso, T., & Barnum, R. (2000). *Massachusetts Youth Screening Instrument—2: User's Manual and Technical Report.* Worcester, MA: University of Massachusetts Medical School.

Guo, J., Hill, K. G., Hawkins, J. D., Catalano, R. E., & Abbott, R. D. (2002). A developmental analysis of sociodemographic, family, and peer effects on adolescent illicit drug initiation. *Journal of the American Academy of Child and Adolescent Psychiatry, 41,* 838–845.

Harrell, A. V. (1997). The validity of self-reported drug use data: The accuracy of responses on confidential self-administered answered sheets. *National Institute on Drug Abuse (NIDA) Research Monograph, 167,* 37–58.

Harrison, L. D. (1995). The validity of self-reported data on drug use. *Journal of Drug Issues, 25,* 91–111.

Harrison, P. A., Fulkerson, J. A., & Beebe, T. J. (1998). DSM-IV substance use disorder criteria for adolescents: A critical examination based on a statewide school survey. *American Journal of Psychiatry, 155,* 486–492.

Hasin, D., & Paykin, A. (1998). Dependence symptoms but no diagnosis: Diagnostic orphans in a community sample. *Drug and Alcohol Dependence, 50,* 19–26.

Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin,112,* 64–105.

Henly, G. A., & Winters, K. C. (1988). Development of problem severity scales for the assessment of adolescent alcohol and drug abuse. *The International Journal of the Addictions, 23,* 65–85.

Hill, S. Y., & Muka, D. (1996). Childhood psychopathology in children from families of alcoholic female probands. *Journal of the American Academy of Child and Adolescent Psychiatry, 31,* 1024–1030.

Inwald, R.E., Brobst, M.A., & Morissey, R.F. (1986). Identifying and predicting adolescent behavioral problems by using a new profile. *Juvenile Justice Digest, 14,* 1–9.

Jacobson, N. S., & Truax, P. (1991). Clinical significance: A statistical approach to defining meaningful change in psychotherapy research. *Journal of Consulting and Clinical Psychology, 59,* 12–19.

Johnston, L. D., & O'Malley, P. M. (1997). The recanting of earlier reported drug use by young adults. *NIDA Research Monograph, 167,* 59–80.

Johnston, L. D., O'Malley, P. M., & Bachman, J. G. (2003). *Monitoring the Future national survey results on drug use, 1975–2002.* Volume 1: Secondary School Students (NIH Publication No. 03–5375). Bethesda, MD: National Institute on Drug Abuse.

Kaczynski, N. A., & Martin, C S. (1995). Diagnostic orphans: Adolescents with clinical alcohol symptomology who do not qualify for DSM-IV abuse or dependence diagnosis. Paper presented at the annual meeting of the Research Society on Alcoholism, Steamboat Springs, CO, June, 1995.

Kaminer, Y. (1991). Adolescent substance abuse. In R. J. Frances & S. I. Miller (Eds.), *The clinical textbook of addictive disorders* (pp. 320–346). New York: Guilford Press.

Kaminer, Y. (1994). *Adolescent substance abuse.* New York: Plenum Publishing Corporation.

Kaminer, Y., Bukstein, O. G., & Tarter T. E. (1991). The Teen Addiction Severity Index (T-ASI): Rationale and reliability. *International Journal of Addiction, 26,* 219–226.

Kandel, D. B. (1975). Stages in adolescent involvement in drug use. *Science, 90,* 912–914.

Kandel, D. B., & Davies, M. (1996). High school students who use crack and other drugs. *Archives of General Psychiatry, 53,* 71–80.

Knight, J., Sherritt, L., Harris, S.K., Gates, E., & Chang, G. (2003). Validity of brief alcohol screening tests among adolescents: A comparison of the AUDIT, POSIT, CAGE and CRAFFT. *Alcoholism: Clinical & Experimental Research, 27,* 67–73.

Kokotailo, P. (1995) Physical health problems associated with adolescent substance abuse. In E. Rahdert & D. Czechowicz (Eds.). *Adolescent drug abuse: Clinical assessment and therapeutic interventions* (pp.112–129). NIDA Research Monograph No. 156, NIH Publication No. 95–3908. Rockville, MD: National Institute on Drug Abuse.

Leccese, M., & Waldron, H. B. (1994). Assessing adolescent substance use: A critique of current measurement instruments. *Journal of Substance Abuse Treatment, 11,* 553–563.

Lewinsohn, P. M., Rohde, P., & Seeley, J. R. (1996) Alcohol consumption in high school adolescents: Frequency of use and dimensional structure of associated problems. *Addiction, 91,* 375–390.

Lynskey, M. T., & Fergusson, D. M. (1995). Childhood conduct problems, attention deficit behaviors, and adolescent alcohol, tobacco, and illicit drug use. *Journal of Abnormal Child Psychology, 23* (3), 281–302.

Mackenzie, R. G. (1993). Influence of drug use on adolescent sexual activity. *Adolescent Medicine: State of the Art Reviews, 4*(2). Philadelphia, PA: Herley & Belfus.

Maisto, S. A., Connors, G. J., & Allen, J. P. (1995). Contrasting self-report screens for alcohol problems: A review. *Alcoholism: Clinical and Experimental Research, 19,* 1510–1516.

Magura, S., & Kang, S. Y. (1997). The validity of self-reported cocaine use in two high-risk populations. *National Institute on Drug Abuse (NIDA) Research Monograph, 167,* 227–246.

Mannuzza, S., Klein, R. G., Bessler, A., Malloy, P., & LaPadula, M. (1993). Adult outcome of hyperactive boys' educational achievement, occupational rank, and psychiatric status. *Archives of General Psychiatry, 50,* 565–576.

Markwiese, B. J., Acheson, S. K., Leven, E. D., Wislosn, W. A., & Swartzwelder, H. S. (1998). Differential effects of ethanol on memory in adolescent and adults rats. *Alcoholism: Clinical and Experimental Research, 22,* 416–421.

Martin, C. S., Kaczynski, N. A., Maisto, S. A., Buckstein, O. M., & Moss, H. B. (1995). Patterns of DSM-IV alcohol abuse and dependence symptoms in adolescent drinkers. *Journal of Studies on Alcohol, 56,* 672–680.

Martin, C. S., Kaczynski, N. A., Maisto, S. A., & Tarter, R. E. (1996). Poly drug use in adolescent drinkers with and without DSM-IV alcohol abuse and dependence. *Alcoholism: Clinical and Experimental Research, 20,* 1099–1108.

Martin, C. S., & Nirenberg, T. D. (1991). Alcohol content variation in the assessment of alcohol consumption. *Addictive Behaviors, 16(6),* 555–560.

Martin, C. S., & Winters, K. C. (1998). Diagnosis and assessment of alcohol use disorders among adolescents. *Alcohol Health and Research World, 22(2),* 95–105.

Martin, C. S., Lynch, K. G., Pollock, N. K., & Clark, D. B. (2000). Gender differences and similarities in the personality correlates of adolescent alcohol problems. *Psychology of Addictive Behaviors, 14,* 121–133.

Martino, S., Grilo, C.M., & Fehon, D.C. (2000). The development of the drug abuse screening test for adolescents (DAST-A). *Addictive Behaviors, 25,* 57–70.

McGue, M. (1999). Behavioral genetics models of alcoholism and drinking. In K. E. Leornard, & H. T. Blane, (Eds.), *Psychological Theories of Drinking and Alcoholism* (2nd Ed). New York: Guilford, (pp. 372–421).

McLaney, M. A., Del-Boca, F., & Babor, T. (1994). A validation study of the Problem Oriented Screening Instrument for Teenagers (POSIT). *Journal of Mental Health- United Kingdom, 3,* 363–376.

McLellan, A. T., Luborsky, L., Woody, G. E., & O'Brien, C. P. (1980). An improved diagnostic evaluation instrument for substance abuse patients: The Addiction Severity Index. *Journal of Nervous and Mental Disease, 186,* 26–33.

Milberger, S., Biederman, J., Faraone, S. V., Chen, L., & Jones, J. (1997). ADHD is associated with early initiation of cigarette smoking in children and adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry, 36,* 37–44.

Miller, G. (1985). *The Substance Abuse Subtle Screening Inventory-Adolescent Version.* Bloomington, IN: SASSI Institute.

Moss, H. B., Clark, D. B., & Kirisci, L. (1997). Developmental timing of paternal substance use disorder offset and the severity of problem behaviors in their prepubertal sons. *The American Journal on Addictions, 6,* 30–37.

Meyers, K., McLellan, A.T., Jaeger, J.L., & Pettinati, H.M. (1995). The development of the Comprehensive Addiction Severity Index for Adolescents (CASI-A): An interview for assessing multiple problems of adolescents. *Journal of Substance Abuse Treatment, 12,* 181–193.

Noam, G. G., & Houlihan, J. (1990). Developmental dimensions of DSM-III diagnoses in adolescent psychiatric patients. *American Journal of Orthopsychiatry, 60,* 371–378.

Newman, F.L., Ciarlo, J.A., & Carpenter, D (1999). Guidelines for selecting psychological instruments for treatment planning and outcome. In M. E. Maruish (Ed), *The use of psychological testing and treatment planning for outcomes and assessment, second edition* (pp. 153–170). Mahwah, New Jersey: Lawrence Erlbaum Associates.

Patterson, G. R., Forgatch, M. S., Yoerger, K. L., & Stoolmiller, M. (1998). Variables that initiate and maintain an early-onset trajectory for juvenile offending. *Development and Psychopathology, 10,* 531–548.

Petraitis, J., Flay, B. R., & Miller, T. Q. (1995). Reviewing theories of adolescent substance abuse: Organizing pieces in the puzzle. *Psychological Bulletin, 117,* 67–86.

Pollock, N. K., & Martin, C. S. (1999). Diagnostic orphans: Adolescents with alcohol symptoms who do not qualify for DSM-IV abuse or dependence diagnoses. *American Journal of Psychiatry, 156,* 897–901.

Rahdert, E. (Ed.) (1991). *The Adolescent Assessment/Referral System Manual.* Rockville, MD: U.S. Department of Health and Human Services, ADAMHA, National Institute on Drug Abuse, DHHS Pub. No. (ADM) 91–1735.

Rao, U., Daley, S., & Hammen, C. (2000). Realtionship between depression and substance use disorders in adolescent women during the transition to adulthood. *Journal of the American Academy of Child & Adolescent Psychiatry, 39*(2), 215–222.

Rohde, P., Lewinsohn, P. M., & Seely, J. R. (1996). Psychiatric comorbidity with problematic alcohol use in high school students. *Journal of the American Academy of Child and Adolescent Psychiatry, 35*(1), *101–109.*

Rose, R. (1998). A developmental behavioral-genetic perspective on alcoholism risk. *Alcohol Health and Research World, 22,* 131–143.

Shaffer, D., Fisher, P. & Dulcan, M. (1996). The NIMH Diagnostic Interview Schedule for Children (DISC 2.3): Description, acceptability, prevalences, and performance in the MECA study. *Journal of the American Academy of Child and Adolescent Psychiatry, 35,* 865–877.

Shedler, J., & Block, J. (1990). Adolescent drug use and psychological health. *American Psychologist, 45,* 612–630.

Single, E., Kandel, D., & Johnson, B. D. (1975). The reliability and validity of drug use responses in a large-scale longitudinal survey. *Journal of Drug Issues, 5,* 426–443.

Sobell, L. C., & Sobell, M. B. (1992). Time-line Follow-back: A technique for assessing self-reported alcohol consumption. In R. Z. Litten & J. P. Allen (Eds.), *Measuring Alcohol Consumption* (pp. 73–98). Totowa, NJ: Humana Press.

Spear, L. P. (2000). The adolescent brain and age-related behavioral manifestations. *Neuroscience and Biobehavioral Reviews, 24,* 417–463.

Stinchfield, R. D. (1997). Reliability of adolescent self-reported pretreatment alcohol and other drug use. *Substance Use and Misuse, 32,* 63–76.

Substance Abuse and Mental Health Services Administration. (2001). 2001 National Household Survey on Drug Abuse. Retrieved July 30, 2003,from http://www.samhsa.gov/oas/nhsda/2k1nhsda/vol1/toc.htm

Tarter, R. E., Laird, S. B., Bukstein, O., & Kaminer, Y. (1992). Validation of the adolescent drug use screening inventory: Preliminary findings. *Psychology of Addictive Behaviors, 6,* 322–236.

Thompson, L. L., Riggs, P. D., Mikulich, S. K., & Crowley, T. J. (1996). Contribution of ADHD symptoms to substance problems and delinquency in conduct-disordered adolescents. *Journal of Abnormal Child Psychology, 24(3),* 325–347.

Varlinskaya, E.I., & Spear, L.P. (in press). Acute effects of ethanol on social behavior of adolescent and adult rats: Role of familiarity of the test situation. *Alcoholism: Clinical and Experimental Research.*

Wanberg, K. (1992). *Adolescent Self-Assessment Profile.* Arvada, CO: Center for Addictions Research and Evaluation.

Welner, Z., Reich, W., Herjanic, B., Jung, K., & Amado, K. (1987). Reliability, validity and parent-child agreement studies of the Diagnostic Interview for Children and Adolescents (DICA). *Journal of American Academy of Child Psychiatry, 26,* 649–653.

White, H. R., & Labouvie, E. W. (1989). Towards the assessment of adolescent problem drinking. *Journal of Studies on Alcohol, 50,* 30–37.

Williams, R.J., & Chang, S.Y. (2000). Comprehensive and comparative review of adolescent substance abuse treatment outcome. *Clinical Psychology: Science and Practice, 7,* 138–166.

Willner, R. (2000). Further validation and development of a screening instrument for the assessment of substance misuse in adolescents. *Addiction, 95,* 1691–1698.

Winters, K.C. (1992). Development of an adolescent alcohol and other drug abuse screening scale: Personal Experience Screening Questionnaire. *Addictive Behaviors, 17,* 479–490.

Winters, K. C. (1994). Assessment of adolescent drug abuse: A handbook. Los Angeles, CA: Western Psychological Services.

Winters, K. C. (2001). Adolescent assessment of alcohol and other drug use behaviors. In J. P. Allen & V. Wilson (Eds.), *Assessing alcohol problems: A guide for clinicians and researchers* (2nd ed.). Rockville, MD: National Institute on Alcohol Abuse and Alcoholism.

Winters, K. C., Anderson, N., Bengston, P., Stinchfield, R. D., & Latimer, W. W. (2000). Development of a parent questionnaire for the assessment of adolescent drug abuse. *Journal of Psychoactive Drugs, 32,* 3–13.

Winters, K. C., & Henly, G. A. (1989). *Personal Experience Inventory and Manual.* Los Angeles: Western Psychological Services.

Winters, K.C., & Henly, G.A. (1993). *Adolescent Diagnostic Interview Schedule and Manual.* Los Angeles: Western Psychological Services.

Winters, K. C., Latimer, W., & Stinchfield, R. D. (1999). The DSM-IV criteria for adolescent alcohol and cannabis use disorders. *Journal of Studies on Alcohol, 60*(3), 337–344.

Winters, K. C., Latimer, W. W., Stinchfield, R. D., Henly, G. A. (1999). Examining psychosocial correlates of drug involvement among drug clinic-referred youth. *Journal of Child & Adolescent Substance Abuse, 9(1), 1–17.*

Winters, K. C., Stinchfield, R. D., Henly, G. A. & Schwartz, R. (1990–1991). Validity of adolescent self report of substance involvement. *The International Journal of the Addictions, 25,* 1379–1395.

Wish, E., Hoffman, A., & Nemes, S. (1997). The validity of self-reports of drug use treatment admission and at follow-up: Comparisons with urinalysis and hair analysis. *National Institute on Drug Abuse (NIDA) Research Monograph, 167,* 200–226.

Yamaguchi, K., & Kandel, D. B. (1984). Patterns of drug use from adolescence to young adulthood-III: Patterns of progression. *American Journal of Public Health, 74,* 673–681.

Zucker, R. A., Fitzgerald, H. E., & Moses, H. D. (1995). Emergence of alcohol problems and the several alcoholisms: A developmental perspective on etiologic theory and life course trajectory. In D. Cicchetti, & D.J. Cohen (Eds.), *Developmental Psychopathology Vol. 2: Risk, Disorder, and Adaptation* (pp.677–711). New York: Wiley.