RECENT DEVELOPMENTS IN

ALCOHOLISM

VOLUME 17

ALCOHOL PROBLEMS IN ADOLESCENTS AND YOUNG ADULTS

RECENT DEVELOPMENTS IN

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Preface

From the President of the American Society for Addiction Medicine

Even after stepping through the doorway into the 21st century, alcoholism remains a major contributor to the excess morbidity and mortality experienced by Americans. No where is this unmet need more dramatic than its impact on adolescents.

In this edition, the authors cover the wide spectrum of epidemiologic, prevention, neurobiological, behavioral and clinical issues related to alcohol use and adolescents. The wide range of topical areas mirrors the prominence of alcoholism and alcohol abuse in the American landscape. Each of these areas alone presents significant challenges and opportunities to assist in understanding the fundamental issues and crafting effective remedies.

Aside from the obvious value of contributing to the scientific portfolio of what is known, the value of this edition is meaningful beyond the eloquent study designs and erudite principles presented by the superb cadre of authors. Adolescence is already challenging. The addition of alcohol has only made it more so.

It makes sense that effective remedies to this major public health and societal challenge would be multifaceted, comprehensive, and guided by scientific evidence. The scientific information in this edition provides ample contributions to this effort.

Lawrence S. Brown., Jr., MD, MPH, FASAM
President, American Society on Addiction Medicine

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Epidemiology

Vivian B. Faden, *Section Editor*

Alcohol is the substance most frequently used by youth. According to 2002 data from Monitoring the Future (MTF), a nationally representative survey of youth, 78% of 12th graders, 67th of 10th graders and 47% of 8th graders reported consuming alcohol in their lives. Furthermore, 62% of 12th graders, 44% of 10th graders and 21% of 8th graders reported having been drunk. In 2002, the 30-day prevalence of alcohol consumption was 20% for 8th graders, 35% for 10th graders and 49% for 12 graders. The prevalence of heavy episodic drinking (5 or more drinks in a row in the past 2 weeks) was 12% among 8th graders, 22% among 10th graders and 29% among 12th graders (Johnston et al, 2003). And youth who drink may experience a range of adverse short and long-term consequences including academic problems such as lower grades or school failure, social problems, physical problems such as hangovers or medical illnesses, unwanted or unintended sexual activity, physical and sexual assault, memory problems, increased risk for suicide and homicide, alcohol-related car crashes and death from alcohol poisoning. Clearly, drinking by young people and its consequences presents a significant public health problem which must command our attention. This volume of *Recent Developments in Alcoholism* focusing on alcohol consumption by adolescents and young adults is therefore extremely timely.

The first section of the volume is comprised of five chapters which address the epidemiology of alcohol consumption by and alcohol-related problems among adolescents. Epidemiology is defined as the study of how a disease or problem is distributed in the population and of the characteristics that influence that distribution. As such epidemiology informs us about the severity of a problem, its natural history, and its prognosis. From epidemiologic studies (e.g. MTF cited above) we can learn how widespread a problem is, dis-

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cover which groups suffer most from it and identify its short and long term consequences. Such studies also serve to identify associated risk and protective factors which in turn help to identify those individuals who may be at increased risk due to neurobiological, environmental and individual factors. These factors include family history and genetic vulnerability, comorbid conditions, socio-demographic characteristics, social stressors such as poverty and lack of social support, family characteristics, alcohol availability and personality and other personal factors to mention just a few. But the ultimate goal of epidemiology goes beyond description; ultimately, a better understanding of what leads to underage use of alcohol at different developmental stages can inform prevention and treatment. For example, knowledge of protective factors may guide the design of interventions to increase resilience and identification of high risk groups may stimulate the design of interventions specifically for these groups.

The first chapter in this section summarizes what we know about the epidemiology of alcohol consumption by adolescents in the general population. In the chapter entitled "Alcohol Consumption and its Consequences Among Adolescents and Young Adults," Michael Windle and Rebecca Windle discuss the high prevalence of drinking among young people and describe its many consequences, some very serious. General population surveys (e.g. National Survey on Drug Use and Health, MTF) as well as smaller more localized studies have uniformly found high rates of alcohol consumption among young people aged 12 to 20. As already mentioned those youth who drink may experience a range of adverse academic, social, legal and medical consequences. The authors indicate that available data consistently show rates of drinking are highest among White and American Indian or Alaskan Native youth, followed by Hispanic youth, African Americans, and Asians. The authors also indicate that alcohol consumption generally increases with increasing age. Prevalence rates for boys and girls are similar in the younger age groups; however among older adolescents, the prevalence for boys is greater than for girls for more frequent and heavier use. The authors also discuss alcohol's association with other health-compromising behaviors such as other substance use and risky sex and the prevalence of alcohol use disorders among youth. Thus, this chapter serves to provide a broad understanding of the prevalence of alcohol consumption and its consequences among youth in general.

In the second chapter in this section entitled "High Risk Adolescent and Young Adult Populations—Consumption and Consequences," Brooke Molina looks more specifically at certain groups of adolescents at increased risk: those with comorbid psychiatric conditions; those with a positive family history of alcohol problems; gay and lesbian youth; homeless and throwaway youth; and those who belong to ethnic and racial groups with greater vulnerability. Studies indicate that at least some youth in each of these categories experience heightened vulnerability and therefore may benefit from targeted interventions. For example, as described in this chapter, there is convergence in the literature that there is a strong association of conduct problems and alcohol

consumption, and according to a national survey, youth who identify themselves as gay, lesbian or bisexual are at elevated risk for heavy alcohol consumption. However as the authors of this chapter aptly point out, the same youth are likely to be vulnerable for a number of reasons, as risk factors tend to cluster in individuals. Underage alcohol consumption should therefore be studied in a conceptual framework which addresses the full constellation of risk and protective factors from early childhood through adolescence and into young adulthood.

In the next chapter, "Drinking among College Students—Consumption and Consequences," Kristina Jackson, Kenneth Sher and Aesoon Park consider alcohol consumption, alcohol-related consequences and problems, and alcohol dependence among a specific group of youth who consume alcohol at high levels, college students. Studies consistently indicate that about 4 out of 5 college students drink alcohol, about 2 out of 5 engage in excessive heavy consumption (5 or more drinks in a row for men and 4 or more in a row for women in the past two weeks or 30 days, depending on the survey) and about 1 in 5 engages in frequent episodic heavy consumption (3 or more times in the past two weeks) (NIAAA, 2002). The consequences of this consumption may include academic problems, social problems, legal problems, involvement in physical or sexual assault or risky sex, and even death. The authors of this chapter carefully review available information about levels and patterns of consumption in this population, consider individual, intra-campus and inter-campus factors which relate to drinking in college, and discuss what is currently known about the long-term negative outcomes of drinking by college students. They identify the need for prospective information to establish causality, however, and the need for more information about long-term outcomes, particularly in the area of academic achievement. The authors also highlight the need to consider the developmental course of alcohol involvement among college drinkers and the roles in their drinking of individual and institutional factors, as well as their interactions.

The fourth chapter, "The Initiation and Course of Alcohol Use among Adolescents and Young Adults" by Jennifer Maggs and John Schulenberg, looks within and across individuals to study the initiation of alcohol consumption and its escalation and/or de-escalation over time. In the case of alcohol consumption by adolescents, studying the developmental trajectory of drinking behavior and the roles of various risk and protective factors in influencing those trajectories at different points in development is critical to understanding the complexity of the problem we face as we work to reduce underage alcohol consumption. This chapter discusses research on the initiation of drinking and the significance of the age of initiation for future alcohol-related outcomes. This is very important since national surveys indicate that half of 8th graders have already initiated alcohol use. The chapter goes on to discuss the course of alcohol use during adolescence and early adulthood using both variable centered and pattern centered approaches for understanding drinking trajectories in individuals and populations.

Finally, the last chapter deals with the identification of alcohol abuse and alcohol dependence among youth. Accurate measurement of the problem under consideration is essential to accurate epidemiologic study and reaching appropriate conclusions. One very important part of the epidemiology of alcohol consumption among adolescents and young adults involves estimating the prevalence of alcohol use disorders in this population. In their chapter entitled, "Diagnosis, Course, and Assessment of Alcohol Abuse and Dependence in Adolescents," Tammy Chung, Christopher Martin and Ken Winters discuss the problems with applying the Diagnostic and Statistical Manual of Mental Disorders (DSM) criteria, which were developed for adults, to children and adolescents. For example, the symptoms of tolerance and drinking more or longer than intended may not be appropriate for the developmental period of adolescence. The authors underscore the need for a developmental perspective in studying the manifestation of symptoms among youth and understanding the significance of those symptoms. Although included in this section, this chapter is also pertinent to the study of treatment which involves making appropriate diagnostic inferences and therefore is also relevant to the section of the volume concerning treatment.

In summary, this section provides a great deal of very important information about alcohol consumption among adolescents and young adults. It provides information about how much and about which youth drink, describes the risk and protective factors for this behavior, discusses the initiation and course of alcohol consumption among youth, details its consequences and discusses diagnostic issues particular to youth. But in addition and equally important, each chapter also points out critical conceptual challenges which must be faced as we seek to better understand alcohol consumption and alcohol-related problems among youth in a developmental context.

1. Johnston, L. D., O'Malley, P. M., & Bachman, J. G. (2003). Monitoring the Future national survey results on drug use, 1975–2002. Volume I: Secondary school students (NIH Publication No. 03–5375). Bethesda, MD: National Institute on Drug Abuse, 520 pp.

2. National Institute on Alcohol Abuse and Alcoholism (2002). High-Risk Drinking in College: What We Know and What We Need To Learn, Final Report of the Panel on Contexts and Consequences, Task Force of the National Advisory Council on Alcohol Abuse and Alcoholism, National Institutes of Health, U. S. Department of Health and Human Services.

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Diagnosis, Course, and Assessment of Alcohol Abuse and Dependence in Adolescents

Tammy Chung, Christopher S. Martin, and Ken C. Winters

Abstract. Risk for the onset of an alcohol use disorder (AUD) peaks during adolescence and the transition to young adulthood, highlighting the public health significance of alcohol use by adolescents. This chapter summarizes recent research on the diagnosis, course, and assessment of adolescent AUDs. This review focuses on developmental considerations in assessment of AUD criteria, the prevalence of DSM-IV AUDs among adolescents, typical alcohol symptom profiles in youth, and limitations of DSM-IV AUD criteria when applied to adolescents. In addition, studies of AUD course in adolescents, as well as factors influencing the course of AUDs are summarized. The chapter also provides an overview of brief alcohol screening instruments and other measures used in more comprehensive assessment of AUDs in adolescents.

1. Diagnosis, Course, and Assessment of Alcohol Abuse and Dependence in Adolescents

Adolescence is a period of dramatic change, involving numerous biological, cognitive, and social transitions. These changes have a significant impact on adolescent functioning, including the development of drinking behavior and alcohol-related problems. Therefore, it is important to take a developmental perspective when studying the diagnosis, course, and assessment of adolescent alcohol use disorders (AUDs). When applied to diagnosis, a developmental perspective requires consideration of how AUD symptoms

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manifest differently across the lifespan, reflecting age-related differences in areas such as physical maturation, context of use, and major role obligations (e.g., school vs work). In studies of AUD course, a developmental perspective involves understanding how alcohol use and problems, and maturational and contextual variables unfold and reciprocally influence each other over time. A developmental perspective applied to AUD assessment emphasizes the need to scale measures to an individual's stage of maturation to ensure that the equivalence of a symptom's meaning and clinical significance are maintained across different developmental periods.

In youthful samples, alcohol use and episodic heavy drinking show increasing prevalence with age (Johnston et al., 2003). Adolescents typically engage in a pattern of episodic heavy drinking (Deas et al., 2000), a particularly risky pattern of use that has been associated with the occurrence of alcohol-related problems (Wechsler et al., 1995). A national school-based survey indicated that consumption of five or more drinks in a row in the past two weeks was reported by 12% of eighth graders, 22% of 10th graders, and 29% of high school seniors (Johnston et al., 2003). In this context, risk for the onset of an AUD peaks between the ages of 15 to 20 (Kessler et al., 1994; Helzer et al., 1991). Further, some data suggest an increasing prevalence of adolescent-onset AUDs in recent years (e.g., Nelson et al., 1998). These findings highlight the public health significance of adolescent alcohol use and related problems.

This chapter summarizes recent research on the diagnosis, course, and assessment of AUDs in adolescents. The chapter begins with a review of DSM-IV and ICD-10 criteria for AUDs, developmental considerations in assessment of AUD criteria, the prevalence of DSM-IV AUDs in epidemiologic surveys of adolescents, typical alcohol symptom profiles in youth, and limitations of DSM-IV AUD criteria. Next, studies of predictors and pathways in the course of adolescent AUDs are summarized, including reports on the time course of alcohol symptom development in teens, and the course of AUDs in community and clinical samples of youth. Finally, the section on assessment reviews instruments commonly used in screening for alcohol problems, and more comprehensive methods of evaluating AUDs in adolescents.

2. Diagnosis of AUDs in Adolescents

2.1. DSM-IV and ICD-10 Alcohol Diagnoses

Valid diagnosis is essential to advancing treatment and research on the etiology and course of mental disorders. Diagnostic categories represent evolving constructs that organize and describe a cluster of associated symptoms and behaviors. Ideally, the features that define a diagnostic category occur as a result of shared underlying core pathological processes, and thus show a distinctive course (Millon, 1991). Psychiatric diagnoses serve multiple functions, such as facilitating communication among clinicians and researchers, identify-

ing cases for clinical intervention, increasing homogeneity of research samples, providing phenotypes for genetics research, and conveying information about prognosis (Robins & Barrett, 1989; McGue, 1999). Although alcohol problems appear to define a continuum of severity (e.g., Heath et al., 1994), diagnostic categories complement dimensional approaches by providing categorical groupings that are ultimately necessary to guide research and treatment.

DSM-IV (APA, 2000) includes two AUDs, alcohol abuse and alcohol dependence, which are defined by non-overlapping criterion sets (Table 1). DSM-IV abuse focuses on negative psychosocial consequences resulting from alcohol use, as well as hazardous use, and requires the presence of at least 1 of 4 criteria. Abuse is generally considered a milder AUD relative to dependence due to its one symptom threshold for diagnosis (APA, 2000). DSM-IV dependence, based in part on the Alcohol Dependence Syndrome concept (Edwards & Gross, 1976), is diagnosed when at least 3 of 7 criteria are met within the same 12-month period. Dependence criteria relate to addiction constructs such as

Table 1. DSM-IV Alcohol Abuse and Dependence Criteria

Alcohol Abuse		
Brief Identifier		Abstracted DSM-IV criterion
A1	Role Impairment	Frequent intoxication leading to failure to fulfill obligations at school, work, home
A2	Hazardous Use	Recurrent use when physically hazardous (e.g., drinking and driving)
A3	Legal Problems	Recurrent alcohol-related legal problems
A4	Social Problems	Continued use despite social or interpersonal problems caused or exacerbated by use
Alcohol Dependence		
Brief Identifier		Abstracted DSM-IV criterion
D1	Tolerance	Need to consume more to obtain the same effect; decreased effect at the same dose
D2	Withdrawal	Withdrawal symptoms; drinking to avoid or relieve withdrawal
D3	Larger/Longer	Drinking more or longer than intended
D4	Quit/Cut Down	Persistent desire or repeated unsuccessful attempts to quit or cut down on alcohol use
D5	Much Time	Much time spent obtaining, using, or recovering from the effects of alcohol
D6	Reduced Activities	Reduce or stop important activities in order to drink
D7	Physical/ Psychological Problems	Continued use despite physical or psychological problems caused or exacerbated by use

physical dependence (i.e., tolerance or withdrawal), salience of alcohol use (e.g., lot of time spent drinking), and impaired control over alcohol use (e.g., drinking more or longer than intended). Although no single criterion is necessary or sufficient for a dependence diagnosis, DSM-IV alcohol dependence can be subtyped as with "physiological features," if criteria for tolerance or withdrawal have been met. A diagnosis of dependence precludes abuse, suggesting a hierarchical relation between the two AUDs. Both DSM-IV AUDs require evidence of clinically significant impairment or subjective distress resulting from alcohol use for diagnosis. DSM-IV criteria for alcohol diagnoses are similar to criteria used to diagnose other drug use disorders, although some important differences exist. Due to the high rate of poly-substance use among youth (e.g., Martin et al., 1996a), both alcohol and other drug use behaviors should be assessed in research and clinical settings.

Other classification systems for AUDs, such as ICD-10 (WHO, 1992), have been less well researched in adolescents compared to DSM-IV. ICD-10, like DSM-IV, includes two AUDs: harmful use and dependence. The harmful use diagnosis is represented by a single criterion that specifies a pattern of alcohol use that is causing damage to physical or psychological health. Dependence in ICD-10 requires that 3 or more of 6 symptoms co-occur within a 12-month period: harmful use, tolerance, withdrawal, strong desire to use, impaired control over alcohol use, and preoccupation with use (e.g., giving up activities to drink instead). As in DSM-IV, an ICD-10 diagnosis of dependence precludes harmful use. However, in contrast to DSM-IV, ICD-10 diagnoses of abuse and dependence have overlapping criterion sets. Diagnostic concordance between DSM-IV and ICD-10 AUDs in adolescent drinkers indicated high agreement for the distinction between dependence and no dependence groups (kappa=.81), but poor agreement for the distinction between abuse/harmful use and no diagnosis groups (kappa=.10) (Pollock et al., 2000). These findings reveal a substantial limitation of the abuse/harmful use diagnosis that results from inconsistency in the definition of the abuse/harmful use category across the DSM-IV and ICD-10 classification systems. Other, alternative AUD classification schemes developed specifically for youth also have been proposed (e.g., Wolraich et al., 1996). However, recent diagnostic research on teens has focused almost exclusively on the application of DSM-IV AUDs.

2.2. *Developmental Considerations in AUD Assessment*

Diagnostic criteria for AUDs were derived largely from clinical and research experience with adults, and have been applied to adolescents with no modification of the criteria or diagnostic thresholds. However, numerous developmental differences between adolescents and adults may affect the applicability of AUD criteria to youth. For example, adolescent drinkers have shorter histories of alcohol use compared to adults; and adolescents tend to drink less often, but typically consume a similar quantity per occasion (i.e., heavy episodic drinking) (Bailey et al., 2000; Deas et al., 2000). Developmental

differences in alcohol use patterns emphasize the need to adapt constructs and criteria to make them relevant to and properly scaled for an adolescent's stage of maturation (Brown, 1999). Further, assessment that includes expanded descriptions of symptoms such as "blackout" and "passing out," and specific examples of the phenomenon of interest, can facilitate shared understanding between respondent and interviewer regarding the symptom being queried. Because a construct may manifest differently in adolescents and adults (e.g., role impairment at school vs work), a developmental perspective that takes maturational factors and contextual influences into account is essential for valid assessment of AUDs across the life span.

2.3. *Prevalence of Adolescent AUDs*

The prevalence of adolescent AUDs increases with age, and is generally higher among males compared to females (Martin & Winters, 1998). Using DSM-III-R criteria, AUD prevalence increased from 3.5% among 14 to 16 year olds to 14.6% of 17 to 20 year olds (Cohen et al., 1993). Among 15 to 18 year olds in the National Comorbidity Survey, 13.5% met criteria for a lifetime DSM-IV AUD (Warner et al., 2001). In addition to teens who meet criteria for an alcohol diagnosis, a substantial proportion of youth have AUD symptoms (i.e., 1–2 dependence symptoms), but do not meet criteria for an alcohol diagnosis. These symptomatic teens without an alcohol diagnosis are known as "diagnostic orphans" (Pollock & Martin, 1999), and account for up to an additional 17% of adolescents in community surveys (Chung et al., 2002).

A review of cross-study consistency in DSM-IV AUD prevalence across 4 community surveys in the United States noted lifetime prevalence estimates ranging widely from 1.0 to 13.5% (Chung et al., 2002). In these 4 surveys, lifetime prevalence of DSM-IV alcohol abuse ranged from 0.4 to 9.6%, while alcohol dependence ranged from 0.6 to 4.3%. Variability in the estimated prevalence of AUDs across surveys may be explained, in part, by differences in factors such as sampling strategy (i.e., household vs school-based survey), sample age range, time frame for diagnosis (e.g., past year vs lifetime), and other methodological factors. However, although absolute proportions of cases with an AUD diagnosis may vary due to methodological factors, the relative prevalence of abuse and dependence diagnoses, that is, the ratio of abuse to dependence diagnoses should be relatively consistent across community surveys. DSM-IV does not specify an expected ratio of abuse to dependence in the general population. In the general population, however, milder cases of illness (i.e., abuse) usually outnumber more severe cases (i.e., dependence) (Skinner, 1986). Across 5 community surveys, the abuse-to-dependence ratio ranged from 0.4:1.0 to 4.5:1.0 with a mean ratio of 2.2:1.0 (Chung et al., 2002). Two of the 5 community surveys reported higher rates of the more severe dependence diagnosis relative to the milder abuse diagnosis, and in both surveys, several alcohol dependence symptoms had higher absolute prevalence than the most frequently assigned abuse symptom. These findings point to a major limitation

of DSM-IV AUDs in adolescents, because if abuse and dependence diagnoses are to provide clinically meaningful information, the diagnostic criteria should produce a consistent ratio of the two diagnoses across community samples. Some problems in the assignment of alcohol diagnoses in teens appear to be due to the prevalence of certain dependence symptoms, such as tolerance and drinking more or longer than intended (Chung et al., 2001; Chung & Martin, 2002), emphasizing the importance of valid symptom assessment in youth.

Certain adolescent populations, such as homeless youth, teens involved in the juvenile justice system, and youth seen in psychiatric and some medical settings, have elevated rates of AUD. In a convenience sample of homeless youth, 45% met criteria for alcohol dependence in the past year, 22% for abuse, and 13% were alcohol orphans (Baer et al., 2003). Overall, the majority (80%) of homeless youth in that study reported at least one AUD symptom. Among teens involved with the juvenile justice system, almost one-third (32%) are estimated to meet criteria for an AUD, although the prevalence of AUDs in this high-risk population is largely unknown (Bilchik, 1998). Among adolescent psychiatric inpatients, one study found that 41% met criteria for a current DSM-III-R AUD (Grilo et al., 1996). In an adolescent emergency department sample, 18% of 14 to 19 year olds presenting for treatment of a non-alcohol related injury met criteria for a current DSM-IV AUD (Chung et al., 2000). The high rate of AUDs in certain adolescent populations indicates the utility of alcohol screening among at-risk teens to efficiently identify those who may benefit from alcohol treatment.

Little is known about cross-cultural differences in adolescent AUD prevalence. The literature indicates higher AUD prevalence among teens in the United States compared to Puerto Rico (Warner et al., 2001), and slightly higher AUD prevalence among German youth (Nelson & Wittchen, 1998) compared to teens in the National Comorbidity Survey.

2.4. *Alcohol Symptom Profiles in Youth*

A review of the relative prevalence of DSM-IV AUD symptoms in 5 community and 4 clinical samples of adolescents found only a modest level of agreement (mean Spearman rho=0.47) across studies (Chung et al., 2002). The AUD symptoms assigned to teens most often were two dependence criteria: tolerance and drinking more or longer than intended. Importantly, cross-study variation in the high prevalence of these two common dependence symptoms strongly affect the ratio of abuse to dependence diagnoses, the prevalence of the physiological dependence subtype, and the proportion of subthreshold cases of dependence.

Another method of characterizing adolescents' alcohol symptom profiles, latent class analysis (LCA), assumes that a small number of mutually exclusive latent classes or subtypes can be used to represent the symptom profiles of individuals in a sample. LCA of adolescents' alcohol symptoms does not support the distinct categories of abuse and dependence defined by DSM-IV (Bucholz et al., 2000; Chung & Martin, 2001). Instead, LCA suggests that DSM-IV alcohol

symptoms represent classes arranged along a gradient of illness severity that represent milder and more severe problems, such that the total number of symptoms, rather than type of symptom (i.e., abuse or dependence) distinguishes the classes (Chung & Martin, 2001). In the milder severity class, alcohol-related social problems, an abuse symptom, and tolerance, a dependence symptom had high probability of endorsement. The more severe class was characterized by symptoms that were elevated in the mild class, as well as by higher rates of endorsement for symptoms of alcohol-related role impairment, drinking more or longer than intended, and much time spent drinking. Across all classes, withdrawal was endorsed least often. Some research suggests that withdrawal, in addition to its relatively low prevalence in youth (Langenbucher et al., 2000), may manifest differently in teens compared to adults (Stewart & Brown, 1995). Although LCA produces severity-based profiles of alcohol symptoms in both adolescent and adult samples (e.g., Heath et al., 1994), important developmental differences have been identified with regard to rate of progression from use to problems, severity of alcohol problems and dependence, and the types of alcohol-related problems most likely to be experienced (Deas et al., 2000).

2.5. *Limitations of DSM-IV AUDs in Adolescents*

Although DSM-IV AUDs have shown some validity when used with adolescents in that teens classified as having alcohol dependence, abuse, and no diagnosis differ on external measures of alcohol involvement (e.g., Lewinsohn et al., 1996; Winters et al., 1999), DSM-IV AUDs have limitations, some of which are particularly evident when the criteria are applied to teens. In particular, the abuse and dependence criterion sets are not well distinguished conceptually, and research does not support the distinction between the two criterion sets in severity, age of symptom onset, or symptom profiles identified by latent class analysis or factor analysis. Specific limitations of the abuse diagnosis include its low concordance across different diagnostic systems (Pollock et al., 2000; Mikulich et al., 2001). Abuse criteria also appear to cover problems that are more severe compared to some dependence criteria (Bailey, 1999; Pollock & Martin, 1999). Further, because abuse is generally considered a milder illness category than dependence, the onset of abuse is expected to precede dependence, however, dependence symptoms of tolerance and drinking more or longer than intended typically precede the onset of most abuse symptoms (Martin et al., 1996b; Wagner et al., 2002). In addition, some community surveys report higher prevalence of the more severe dependence diagnosis relative to the milder abuse diagnosis (Chung et al., 2002), a situation that does not conform to most disorders in medicine in which milder conditions are more prevalent than severe conditions. Another limitation of DSM-IV AUDs more generally is the existence of "diagnostic orphans" (i.e., those who have 1–2 dependence symptoms, but do not meet criteria for a DSM-IV AUD). Orphans receive no alcohol diagnosis, but do not differ from those with DSM-IV alcohol abuse on various external validators and outcomes (Pollock & Martin, 1999).