

# A Developmental Perspective on Alcohol Use and Heavy Drinking during Adolescence and the Transition to Young Adulthood\*

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**ABSTRACT.** *Objective:* This article offers a developmental perspective on college drinking by focusing on broad developmental themes during adolescence and the transition to young adulthood. *Method:* A literature review was conducted. *Results:* The transition to college involves major individual and contextual change in every domain of life; at the same time, heavy drinking and associated problems increase during this transition. A developmental contextual perspective encourages the examination of alcohol use and heavy drinking in relation to normative developmental tasks and transitions and in the context of students' changing lives, focusing on interindividual variation in the course and consequences of drinking and on a wide range of proximal and distal influences. Links between developmental transitions and alcohol use and

other health risks are discussed in light of five conceptual models: Overload, Developmental Mismatch, Increased Heterogeneity, Transition Catalyst and Heightened Vulnerability to Chance Events. We review normative developmental transitions of adolescence and young adulthood, focusing on the domains of physical and cognitive development, identity, affiliation and achievement. *Conclusions:* As shown in a selective review of empirical studies, these transitions offer important vantage points for examining increasing (and decreasing) alcohol and other drug use during adolescence and young adulthood. We conclude with a consideration of research and intervention implications. (*J. Stud. Alcohol*, Supplement No. 14: 54-70, 2002)

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*"I'm 21 and in my prime drinking years, and I intend to take full advantage of it!"*

—College student, after a few drinks at a wedding

AS RESEARCHERS and practitioners, we may sometimes underestimate the clarity of young people's thinking about their alcohol use. Most view late adolescence and early adulthood as a time when drinking is common and accepted. Among those who drink, the large majority perceive social and coping benefits of alcohol use and even occasional heavy drinking; they tend to limit their drinking such that it interferes little with work and school responsibilities; and they will diminish their heavy drinking as they move into adult roles. Although many experience negative consequences, most make it through their "prime drinking years" with, in balance, more positive experiences with alcohol than negative ones. At the same time, alcohol use becomes problematic and tragic for many. Heavy drinking, alcohol-related problems and associated risky and illegal behaviors peak during late adolescence and early

adulthood (Baer, 1993; Johnston et al., 2001a,b), as do problems with substance use in general (Glantz et al., 1999; Johnston et al., 2001a,b). This period is an important juncture in the etiology of alcohol misuse and alcoholism, a time when initiation and escalation of heavy drinking may set the stage for lifelong difficulties (e.g., Babor et al., 1992; Zucker, 1987). Even sporadic drinking can lead to a life-altering tragedy when combined with a lapse of judgment or with simple misfortune.

Recognizing how drinking fits into the lives of most young people is a necessary foundation for effective remedies. In the United States (and many other countries; Fillmore et al., 1993), alcohol use and heavy drinking are culturally embedded in the experience of adolescence and the transition to young adulthood in general (Blane, 1979; Donovan et al., 1983) and in the college experience in particular (Straus and Bacon, 1953; Wechsler et al., 1998). During high school, college-bound students have *lower* rates of alcohol and other drug use than their noncollege-bound classmates; in the years immediately following high school, however, college students have *higher* rates of alcohol use and frequent heavy drinking (but still lower rates of use of other substances) (Johnston et al., 2001a,b; Schulenberg et al., 2001a).

Perhaps most indicative of the embeddedness of heavy drinking in the transition to young adulthood is the remarkable historical stability in rates of frequent heavy drinking

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\*This work was supported in part by National Institute on Alcohol Abuse and Alcoholism grants R01-AA06324 and R03-AA09143 (PI: J. Schulenberg) and the Alcoholic Beverage Medical Research Foundation (PI: J. Maggs).

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(i.e., five or more drinks in a row). During the past two decades, despite many social, demographic, political and economic changes—and despite dramatic shifts in cigarette and illicit drug use—rates of frequent heavy drinking among those ages 19-22 have shifted little (average 2-week rate of 39%), especially for college students (42%) (Johnston et al., 2001a,b). This imperviousness to historical change, and to numerous national and local intervention efforts, suggests that excessive drinking during the transition to young adulthood and especially in college is overdetermined (see Wechsler et al., 1998). This is not to justify excessive drinking nor to convey pessimism about the effectiveness of ongoing interventions, but rather to underscore that a multitude of forces at the cultural and individual levels keep this phenomenon in place for many young people.

Our purpose is to provide a developmental perspective on college drinking by examining how the many developmental transitions of adolescence and young adulthood relate to the etiology of alcohol use and heavy drinking. By taking this broader developmental view, we hope to portray the many ways that drinking can fit into the lives of young people in general, and college students in particular. We first consider the meaning and importance of taking a developmental perspective. We then present a conceptual and empirical summary of normative developmental transitions and discuss how they relate to alcohol use. We conclude with a discussion of research, intervention and policy implications.

### **Developmental Perspective on the Etiology of Alcohol Use and Heavy Drinking**

An important question for anyone interested in adolescence is the extent to which this time in life is inherently troublesome. G. Stanley Hall (1904), the founder of the scientific study of adolescence (Muuss, 1996), gave us the enduring image of adolescence as a time of unavoidable “storm and stress.” According to Hall, we can do little to ease adolescents’ pain because development is largely controlled by evolution and biology and thus generally unaffected by culture or context. That is, adolescence is “just a stage,” and when it passes, civility and mental health will return. This view is consistent with psychoanalytic theories: Anna Freud (1958), in particular, argued that the *lack* of adolescent storm and stress signified psychopathology. In contrast, Margaret Mead (1950) and Ruth Benedict (1950) viewed storm and stress primarily as a cultural phenomenon due to the discontinuity in roles and responsibilities between childhood and adulthood in modern societies (see also Schlegel and Barry, 1991). Similarly, Robert Havighurst (1952) viewed adolescent difficulties in terms of a failure to accomplish necessary age-graded, culturally defined developmental tasks.

Although diversity in present-day scientific images of adolescence remains, reflecting strong roots in biology and culture, the notion that adolescence is *necessarily* a turbulent time has received little empirical support (e.g., Douvan and Adelson, 1966; Lerner and Galambos, 1998). A common view consistent with our own perspective is that “adolescence is characterized by change, and is challenging, but it need not be tumultuous and problematic unless societal conditions prompt it” (Petersen and Leffert, 1995, p. 3). Building on this view, this section provides a brief discussion of some key developmental themes as they relate to the etiology of alcohol use and heavy drinking during adolescence and the transition to young adulthood (see also Schulenberg and Maggs, 2001; Schulenberg et al., 2001b).

### *Developmental-contextual perspective*

The developmental-contextual perspective emphasizes multidimensional and multidirectional development across the life span, characterized by a dynamic and progressive mutual selection and accommodation of individuals and their contexts (Baltes, 1987; Elder, 1998; Lerner, 1982; Sameroff, 1987). Humans are viewed as playing a strong role in their own development (Caspi and Moffitt, 1993; Lerner, 1982; Scarr and McCartney, 1983). Through a process of niche selection, individuals elect environments and activities based on personal characteristics, skills, beliefs and goals. Selected ecological niches then expose them to various opportunities and constraints (Nurmi, 1993; Plomin et al., 1997; Scarr and McCartney, 1983).

To help envision contextual influences and person-context interactions on development, Bronfenbrenner (1979) offered an ecology of human development framework that involves nested, interconnected systems to represent the structure of the social context. The developing individual’s primary contexts (microsystems) include, for example, his or her family and school. Interrelations among microsystems (mesosystems) are extremely important in that harmonious ties among microsystems (e.g., supporting common goals for the developing individual) are generally viewed as beneficial. Additional systems include exosystems (i.e., influential external contexts, such as the child’s parents’ work settings) and macrosystems (i.e., broader cultural and historical influences) in which all the other systems are embedded.

Central to our goal of linking developmental transitions with alcohol use are ecological transitions, which Bronfenbrenner (1979) defined as occurring “whenever a person’s position in the ecological environment is altered as a result of a change in role, setting, or both” (p. 26). Ecological transitions typically involve changes at the individual, microsystem and mesosystem levels. As a result of a given transition, mesosystems among new and recurring micro-

systems may become stronger or weaker, which in turn has implications for the developing individual's health and well-being. Furthermore, links between pretransitional microsystems (e.g., high school) and new microsystems (e.g., college) can be viewed as mesosystems as well, suggesting the importance of contextual influences on successful adaptation during transitions.

This emphasis on ecological transitions highlights both developmentally proximal and distal influences on behavior, setting the foundation for considerations of turning points and developmental discontinuity (Elder, 1998; Rutter, 1996). Furthermore, following from the emphasis on person-context interactions, considerations of interindividual similarities and differences in intraindividual change are essential, with less emphasis on normative trends in developmental change and more emphasis on different trajectories of change over time.

As we illustrate throughout this article, key developmental themes—including person-context interactions, continuity and discontinuity, distal and proximal influences and individual differences and similarities in intraindividual change—represent important foundations for understanding how alcohol and other drug use fits into the lives of young people.

### *Trajectories of frequent heavy drinking*

When considering the etiology of heavy drinking during adolescence and the transition to young adulthood, it is essential to examine different trajectories of drinking over time; otherwise, one may be misled by the normative developmental trend and fail to appreciate the wide diversity of patterns of change in heavy drinking over time (e.g., Bates and Labouvie, 1997; Guo et al., 2000; Muthén and Muthén, 2000; NIAAA, 2000). For example, based on the Monitoring the Future data, Schulenberg et al. (1996a) examined distinct trajectories of change in frequent heavy drinking (i.e., five or more drinks in a row) across four waves during the transition to young adulthood (ages 18-24). Using conceptual groupings and cluster analysis, they found six trajectory groups labeled as Chronic, Decrease, Increase, Fling, Rare and Never. (About 10% of the sample was Other.) The mean scores for these trajectory groups (except the Never group, representing 36% of the sample) are illustrated in Figure 1. Note the discrepancy between what is learned from the "total" line versus from the trajectory group lines.

There are important differences in the prevalence of the trajectory groups according to demographic factors and

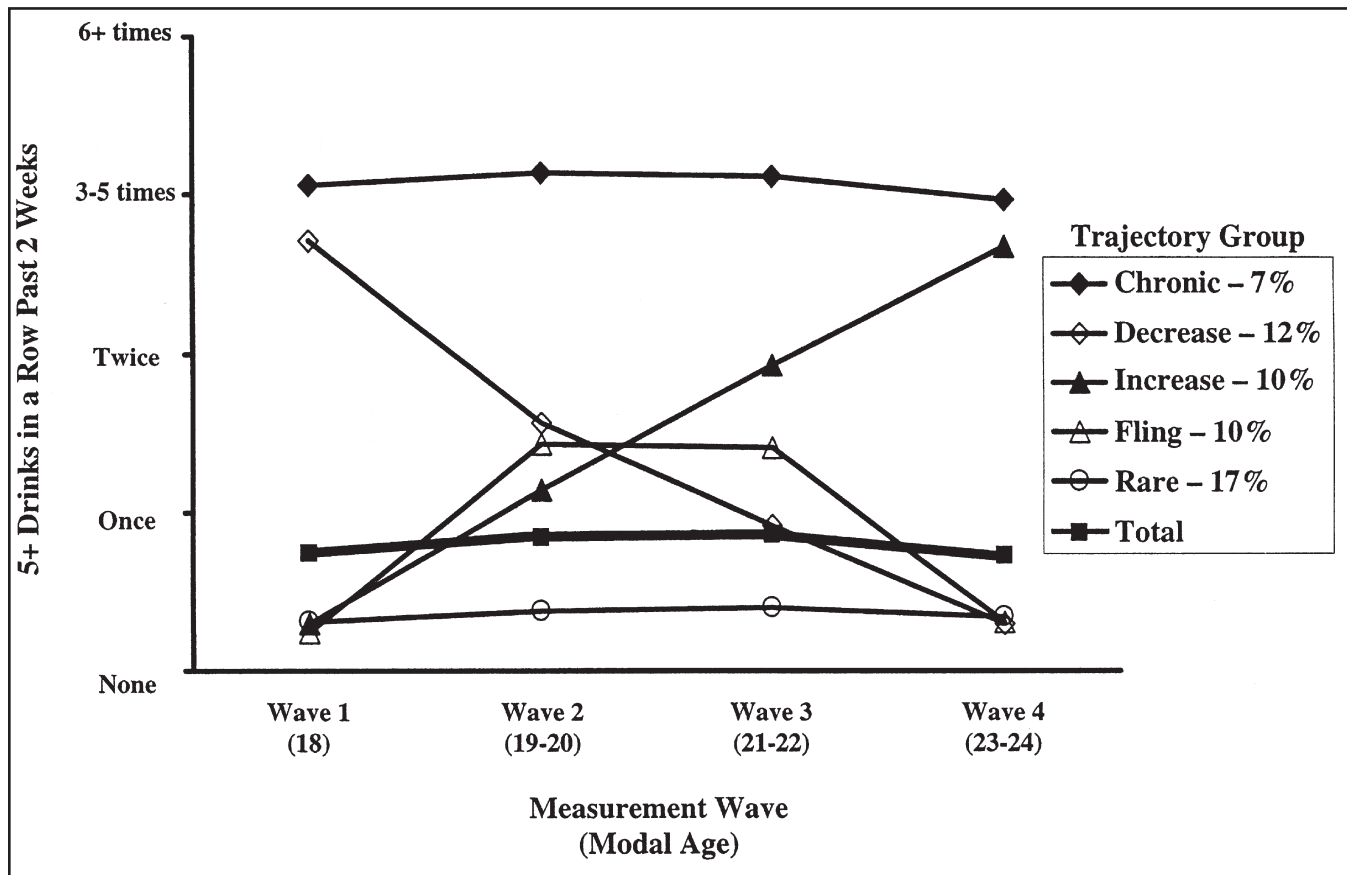


FIGURE 1. Mean score for 5+ drinks in a row in past 2 weeks by frequent heavy drinking trajectory group

student status. Women are underrepresented in the Chronic and Increase groups and overrepresented in the Never group; white youths are generally overrepresented in all heavy episodic drinking groups except the Never group. Compared with their noncollege agemates, college students are overrepresented in the Increase and Fling groups and underrepresented in the Decrease group. Compared with students who live with their parents, those who live away and especially those who are active in fraternities or sororities are overrepresented in the Chronic, Increase and Fling groups and underrepresented in the Never group (Schulenberg, 1999; Schulenberg et al., 1996a; see also Bachman et al., 1997).

By focusing on differential change in alcohol use, we can see more clearly how a given level of use at one point in time represents a number of different more or less troublesome trajectories. Frequent heavy drinking during the first year of college may reflect continuity of a pattern established in high school, or it may reflect a newly emergent, time-limited pattern (see Figure 1). Similarly, as Weber et al. (1989) found among two groups of high school students with similarly high levels of substance use, one group had a lengthy prior history of persistent and severe difficulties, and the other group had only recent and moderate difficulties. In these examples, which illustrate the concept of equifinality (discussed below), different trajectories that lead to similar endpoints can reflect very different antecedents and possible remedies (Loeber, 1982; Moffitt, 1993; Moffitt et al., 1996; Zucker et al., 1995). Likewise, heavy drinking during the first year of college may or may not reflect a future escalating trajectory (illustrating multifinality, discussed below). Although many young people who misuse substances experience ongoing misuse extending into adulthood, most desist with the onset of adulthood roles (Bachman et al., 1997; Jessor et al., 1991). These two distinct trajectories of misuse stemming from a similar initial level have different implications for consequences and remedies.

#### *Risk and protective factors from a developmental perspective*

A more developmentally sensitive understanding of risk and protective factors will provide a stronger foundation for addressing fundamental questions about substance use etiology and intervention (Clayton, 1992; Schulenberg et al., 2001b). A quarter century of empirical work has yielded a large and sometimes overwhelming array of substance use risk and protective factors (e.g., see Hawkins et al., 1992; Petraitis et al., 1995). The task now for scientists is to understand more fully how risk and protective factors are linked with substance use within individuals over time and across contexts (Bates and Labouvie, 1995; Cicchetti, 1999). Below, we highlight three key issues of concern

when examining risk and protective factors from a developmental perspective (see also Schulenberg et al., 2001b).

*Relationship between risk and protective factors.* Risk and protective factors can be viewed as opposite ends of the same continuum. An alternative view is that protective factors moderate or buffer the effects of risk factors (Brook et al., 1992; Garnezy et al., 1984; Hawkins et al., 1992; Lonczak et al., 2001); that is, protective factors operate in the presence of risk factors whose effects they attenuate. A supportive family context, for example, may have a stronger protective effect on substance use in the presence of negative peer influences (Marshal and Chassin, 2000; Oetting and Beauvais, 1986). Protective factors also may operate by reducing the likelihood of risk factors (e.g., strong family relations reduce the presence of negative peer influences by influencing the adolescent's choice of friends).

*Equifinality and multifinality.* One of the most compelling reasons for long-term panel studies on substance use is to identify why great numbers of individuals do not develop serious substance misuse problems despite exposure to significant risk factors, and likewise why many individuals do develop problems despite little exposure to risk factors (Andersson, 2000; Cicchetti, 1999; NIAAA, 2000; Rutter, 1989). The concepts of equifinality and multifinality highlight the probabilistic nature of risk and protective factors (Cicchetti and Rogosch, 1996). With equifinality, different distinct constellations of risk and protective factors can lead to the same outcome. For example, heavy drinking in college may be caused, in part, by parental alcoholism for some young people and by social anxiety for others. With multifinality, a given constellation of risk and protective factors can lead to many alternative outcomes. Parental alcoholism, for example, increases the likelihood of alcohol misuse and dependence (Sher, 1991) as well as of becoming an abstainer. No single risk or protective factor is sufficient or necessary for particular outcomes, thus requiring conceptualizations that focus on the diversity of causal connections (Cairns et al., 1998; Cloninger et al., 1997; Newcomb, 1997; Wachs, 2000).

*Robustness and continuity of risk and protective factors.* Very few risk or protective factors are universal, but rather vary by important demographic and individual characteristics, such as gender (e.g., Hops et al., 1999; Wilsnack, 1995). Likewise, very few risk or protective factors are developmentally continuous. In particular, risk factors for substance use onset may be quite different from risk factors for substance use maintenance and escalation (e.g., Ellickson and Hays, 1991; Newcomb, 1997) and may vary with age at onset (Brook et al., 1999).

Risk and protective factors can be viewed as being robust (i.e., predict current levels of and future changes in substance use), emergent (i.e., predict future changes but not current levels) or concurrent (i.e., predict current levels but not changes). For example, Schulenberg et al. (1996b)

found that at age 18 the drinking motivation of “to get drunk” was a robust risk factor and self-efficacy was an emergent protective factor with respect to current and future increases in heavy drinking. But concurrent risk and protective factors are far more common, and, in longitudinal studies spanning the transition to young adulthood, most substance use risk and protective factors are only concurrent (e.g., Bates and Labouvie, 1997; Gore et al., 1997; Schulenberg et al., 1996b). Concurrent risk and protective factors may change in unison with the changes in substance use, reflecting a continuous association with substance use and their reciprocal relations (Kandel and Raveis, 1989), or they may simply be developmentally limited. Concurrent risk and protective factors may also represent more developmentally or contextually proximal influences, perhaps mediating the effects of distal influences (see Hussong and Chassin, 1997; MacKinnon, 1994; Patterson et al., 1989; Petraitis et al., 1995).

### **Developmental Transitions and Health Risks during Adolescence and Young Adulthood**

The passage into young adulthood is a critical time during which diversity in life trajectories increases (Schulenberg et al., 2000; Sherrod et al., 1993). For many, this period begins when the young adult moves away from home to begin college and live in student residences. As with other developmental changes, this transition involves both gains and losses (Baltes, 1987; Cantor and Langston, 1989), such as new friendship networks, but separation from family and old friends; more academic choices, but new academic demands; and increased independence, but decreased parental guidance and support. Amid all these transitions, alcohol use and heavy drinking tend to escalate, a co-occurrence that is far more than coincidental.

In this section and the next, we address this co-occurrence by examining how various developmental transitions relate to substance use. Building on the developmental contextual perspective, we discuss definition and conceptual issues regarding transitions and examine five conceptual models concerning the link between transitions and health risks.

#### *Defining and conceptualizing developmental transitions*

Developmental transitions are “the paths that connect us to transformed physical, mental, and social selves” (Schulenberg et al., 1997, p. 1). Puberty represents an obvious major transition, as does moving from high school to college, from school to work and from being single to getting married. There are many other more subtle yet significant transitions. For example, a young adolescent who usually does what she is told begins to argue persuasively against her parents’ directives; a small same-sex group of

friends becomes folded into a larger group made up of boys and girls, which in turn is replaced by individual friendships and dating relationships; and a concrete and typically unquestioned self-definition becomes more abstract and tentative, and eventually more hierarchic and future oriented. Together, these and many other transitions provide the structure that transforms children into adolescents and adolescents into young adults.

Individuals can shape their own developmental transitions, as they act on and are acted on by their contexts (Lerner, 1982; Scarr and McCartney, 1983). Indeed, the transition to adulthood years is characterized by increasingly diverse options, opportunities and constraints, and thus behavioral choices may influence transition outcomes to a greater extent than ever before. Developmental transitions are embedded in a sociocultural context and therefore may vary by gender, class, culture and historical period. Culturally based, age-related expectations, or “scripts,” shape these transitions by providing a normative timetable and agenda (e.g., for employment, parenthood) (Neugarten, 1979). Developmental transitions can be normative or nonnormative and can vary in timing, sequence and importance depending on their prevalence within a given population and on personal goals and life situations (Baltes, 1987; Nurmi, 1997).

*Developmental transitions, tasks and trajectories.* Developmental transitions are similar to developmental tasks (Havighurst, 1952), which are socially and biologically prescribed psychosocial tasks that “should” be accomplished during specific sensitive periods across the life span. Although transitions and tasks are related and sometimes even overlap (e.g., the task of selecting a mate versus the transition to marriage), transitions pertain more to the actual process of change than to the accomplishments that contribute to and result from the changes. Transitions are also distinct from trajectories (see Cairns and Cairns, 1994; Crockett and Crouter, 1995), which refer to patterns of systematic and successive change over time that can incorporate several developmental transitions (Elder, 1998). By viewing transitions as embedded in ongoing individual trajectories, it is possible to consider transitions as potential turning points reflecting successive increases or decreases in functioning (Rutter, 1996).

*Discontinuity and continuity.* Issues of discontinuity and continuity are central to understanding the power of major developmental transitions on individuals’ lives (Petersen, 1993; Rutter, 1996). For instance, apparent discontinuities in functioning across transitions may reflect momentary disturbances, after which one’s ongoing trajectory will resume. Likewise, change in functioning during a transition that appears to reflect discontinuity may represent the continuity of adaptation (i.e., phenotypic discontinuity may reflect genotypic continuity) (NIAAA, 2000). But consistent with a developmental-contextual perspective, particularly with the

notion of ecological transitions (Bronfenbrenner, 1979), major transitions like the transition to college can permanently alter one's ongoing trajectory of health and well-being. Indeed, such transitions can be viewed as catalysts or even primary mechanisms for the multifinality of earlier experiences. For example, although the majority mature out of their heavy drinking (Bachman et al., 1997), some continue into adulthood with increasing heavy drinking and related problems. Differentiating these two groups before the transition is difficult (e.g., Baer, 1993; Blane, 1979; Jackson et al., 2001; Windle and Davies, 1999), suggesting that the transition itself may impact the continuation of alcohol-related problems into adulthood (see Tarter and Vanyukov, 1994).

*Distal and proximal developmental influences.* Closely tied to issues of continuity and discontinuity are distal and proximal developmental influences. Developmental transitions reflect proximal developmental influences. Distal and proximal influences are often intertwined: Distal influences may structure proximal influences, and in turn proximal influences may mediate the effects of distal influences. But proximal developmental influences in general and developmental transitions in particular may operate independently of distal influences or may even disrupt distal influences, thus setting the stage for discontinuity.

#### *Conceptual models relating developmental transitions to substance use*

Behavioral and lifestyle health risks tend to increase during adolescence as a direct or indirect function of numerous developmental transitions. To consider this relationship between transitions and health risk changes, and specifically college-relevant transitions and substance use, we briefly describe five interrelated conceptual models based on our previous work (Schulenberg and Maggs, 2001; Schulenberg et al., 1997, 2001b) and that of others (Graber et al., 1998). The models are summarized in Table 1; intervention implications are discussed later.

The Overload Model views health risks as a potential result of experiencing multiple developmental transitions over a relatively short time. This model is consistent with cumulative stress theory, drawing attention to the multiple role changes demanded by major life transitions (Coleman, 1989; Simmons and Blyth, 1987). In the transition to college, individuals begin as adolescents and end as young adults; they change from high school to university student status, sibling to roommate, child in a family to adult in an apartment or residence hall and so on. When multiple transitions overwhelm coping capabilities, well-being may suffer. Health risk behaviors including substance use may serve as alternative coping strategies (Dampousse and Kaplan, 1998; Pandina et al., 1990; Wills and Hirký, 1996).

The Developmental Mismatch Model highlights how developmental transitions can alter the match between individuals and their contexts. Building on person-environment fit theory, the developing individual is viewed as embedded in a changing ecological niche, such that the match between individual developmental needs and opportunities provided by the context is itself dynamic (e.g., Eccles et al., 1993; Galambos and Ehrenberg, 1997; Lerner, 1982). Transitions can improve the match and thus provide opportunities for increased health, or they can lessen the match and thus adversely affect health. In many ways, the transition to college (and to young adulthood more generally) represents a new beginning with opportunities to make new friends, enjoy newfound freedom, explore educational and future career alternatives and experiment with different behaviors and lifestyles. For most young people, such opportunities provide an improved match with their developmental needs, which helps explain why well-being tends to increase more rapidly for those students who go away to college (Schulenberg et al., 2000). For others, however, these opportunities may not match their needs, thus setting the stage for increased health risks (e.g., by their seeking fulfillment in unhealthy compensatory contexts). Transitions may also affect health by altering the match between the individual's immediate contexts (i.e., the mesosystem level) (Bronfenbrenner, 1979). For example, if new peer and academic contexts engender significantly competing goals, health risks are likely to increase.

The Increased Heterogeneity Model suggests that challenging transitions magnify existing strengths and weaknesses, thus increasing interindividual differences in functioning and adjustment. These differences tend to increase throughout adolescence between those who cope effectively with various stressors and those who do not (e.g., Kazdin, 1993; Petersen, 1993). Young people already experiencing difficulties (perhaps including difficulties in negotiating earlier major transitions) may have more trouble in negotiating new transitions and fall further behind their well-functioning peers. For vulnerable individuals who lack social, academic and organizational skills, moving away from home to live in an unfamiliar university environment can be intensely stressful (Compas et al., 1986; Shaver et al., 1985; Zirkel, 1992). In contrast, socially and academically confident students may be primed to take advantage of all that the college experience has to offer. This third model represents, in part, an elaboration of the first two models; it focuses on individual differences in ongoing developmental trajectories and thus interweaves distal and more proximal developmental influences (e.g., see Cairns and Cairns, 1994; Caspi et al., 1988; Crockett and Crouter, 1995).

In the Transition Catalyst Model, risk taking in general is viewed as an important component of negotiating certain

TABLE 1. Conceptual models relating developmental transitions to health risks

Model descriptions	Examples	Intervention implications
<i>Overload</i> Multiple developmental transitions overwhelm coping capacities, resulting in increased health risk behaviors.	Use of alcohol to attempt to cope with heightened stress caused by experiencing multiple transitions.	Stagger timing of major transitions; increase coping capacities.
<i>Developmental Mismatch</i> Developmental transitions alter the goodness-of-fit between individuals and their contexts, resulting in changes in health risk behaviors.	Transition decreases match between needs of individual and opportunities provided in context, resulting in seeking alternative contexts involving increased heavy drinking and other risky behaviors.	Increase match between individual needs and opportunities in context; provide better matching alternative contexts.
<i>Increased Heterogeneity</i> Developmental transitions exacerbate individual differences in ongoing health/well-being trajectories.	Individuals already running an emotional/psychological deficit have difficulty negotiating new transition, resulting in increased alcohol use as a form of self-medication.	Through targeted efforts, counter individual deficits and social networks supportive of problem behaviors.
<i>Transition Catalyst</i> Health risk behaviors may assist in, or be fundamental parts of, negotiating certain developmental transitions.	Alcohol use increases because it is believed to facilitate new friendships, romantic/sexual relations and social bonding.	Provide alternative routes to meeting social and sensation-seeking goals.
<i>Heightened Vulnerability to Chance Events</i> Developmental transitions can increase likelihood and effects of positive and negative chance events.	Increased exploratory behavior of new contexts contributes to novel experiences, including heavy drinking and associated negative effects.	Increase awareness of, and resiliency to, potential negative effects of chance events.

developmental transitions. The idea that some amount of risk taking is normative is supported by high prevalence rates and evidence that it may accompany healthy personality development (e.g., Baumrind, 1987; Silbereisen et al., 1986). According to Chassin et al. (1989), risk taking and even deviance can serve “constructive” as well as “destructive” functions in health and development (see also Jessor and Jessor, 1977; Silbereisen and Noack, 1986; Spear, 2000). As Maggs (1997) demonstrated, alcohol use during the transition to college may help to achieve valued social goals, such as making new friends, yet may threaten safety and short- and long-term health and well-being. Alternatively, substance use can be used to avoid transitions, such as remaining as a “full-time” undergraduate student for 5, 6 or more years and thus delaying adult roles and responsibilities.

The Heightened Vulnerability to Chance Events Model is based on the role of chance in altering the courses of lives (Bandura, 1982) and thus addresses the question of why many difficulties are seemingly unpredictable. Just as there are interindividual differences in receptivity to chance events, there are also intraindividual fluctuations in this receptivity, with certain periods along the life span being more amenable to chance effects. Major developmental tran-

sitions that involve new contexts, such as the transition to college, may be particularly propitious junctures because they engender heightened sensitivity to, and exploratory behavior of, the new context and the self in relation to the new context. Young people in transition are likely to seek out, and be open to the effects of, many novel experiences, which increases their vulnerability to the negative effects of chance events, including increased substance use and increased negative consequences of such use.

These five models are not mutually exclusive. Although some of the models can be viewed as competing ones (especially the first three), they are more appropriately viewed as representing the diverse array of connections between developmental transitions and health risks, especially substance use. Together, the five models represent only part of the total relational structure between substance use and developmental influences, correlates and outcomes. These models, by focusing on transitions, highlight the more developmentally proximal and contextually based connections with substance use, a set of connections that are central to understanding college drinking. Simply, when searching for the developmental roots of college drinking, it is often unnecessary or unproductive to go very far “upstream.” This

is not to deny distal and longer term developmental influences on college drinking, and indeed our Increased Heterogeneity Model interweaves developmental transition influences with ongoing health risk trajectories. Clearly, there are powerful early influences that exert ongoing direct and indirect effects on individuals' adjustment in general and alcohol use and misuse in particular (Chassin et al., 1999b; NIAAA, 2000; Sher et al., 1999; Windle and Davies, 1999). As we discussed earlier, integrating our proximal focus with the predominant longer term developmental focus can yield broader models that more fully capture the complexities of developmental-substance use relationships.

### Domains of Developmental Transitions and Alcohol Use

We now turn to a consideration of the specific developmental transitions of adolescence and young adulthood, focusing on the broad domains of biology, cognition, identity, affiliations and achievement (see Schulenberg et al., 1997). We provide a selective review of the empirical literature to show how these transitions relate to alcohol and other drug use.

#### *Puberty and physical development*

*Physical changes.* Pubertal development during early adolescence is characterized by a rapid acceleration in growth and the development of primary and secondary sex characteristics. By the end of high school, most adolescents have attained full adult height and reproductive capacity. Hormonal changes and societal expectations combine to increase adolescents' interest in romantic and sexual relationships (Udry, 1990) and their tolerance of alcohol (Spear, 1999). The early 20s are also when peak physical functioning occurs (e.g., heart and lung strength, athletic performance) (Arnett, 2000), making it more possible to overcome alcohol's physical effects quickly (Spear, 2000).

*Looking (and desiring to be) older.* As a result of pubertal changes, adolescents attain an increasingly adult appearance, begin to resemble cultural ideals of adult attractiveness and may be mistaken for young adults, facilitating the illegal purchase of alcohol (Wagenaar et al., 1996). Individuals (particularly girls) who mature earlier are more likely to associate with older, more deviant peers (Magnusson et al., 1986). These multiple simultaneous transitions may overload coping capacities (i.e., the Overload Model), setting the stage for increased alcohol and other drug use. Consistent with the Transition Catalyst Model, alcohol use can also be seen as an attempt to appear older (Jessor, 1992): Adolescents aware of adult status privileges including autonomy may view the ability to obtain alcohol as a desired privilege of adulthood.

#### *Cognitive development, perspective taking and decision making*

*Normative cognitive changes.* Major transformations in cognitive reasoning abilities occur during early adolescence, including increases in abstract and hypothetical thinking and the tendency to view issues as relative rather than absolute (Keating, 1990). As a result, adolescents often seem to become more argumentative as they begin to think for themselves and question authority (Smetana, 1988). Adult perceptions of reality become viewed as simply one of many possible perspectives. In addition, teens can now see themselves from the perspective of peers and are acutely aware that their own behavior may affect their image and popularity.

*Invincible and invulnerable?* Adolescents are commonly assumed to think themselves invulnerable, believing the "personal fable" that no harm will come to them (Elkind, 1967). However, research contrasting adolescent with adult decision making has not supported clear age differences in invincibility or the personal fable (e.g., Quadrel et al., 1993). Clearly, with their ability for abstraction, adolescents understand probabilities better than children and may imagine possible negative consequences of actions. How adolescents (and adults) value and weigh the relative costs and benefits of potentially risky behaviors is an area of active debate and research (Beyth-Marom and Fischhoff, 1997). For many, the decision to drink is a given, and decision making becomes centered on when, with whom and how much to drink. Such decisions may make the difference between moderate drinking and heavy drinking, and, at least theoretically, decision-making models can be useful for understanding these decisions. Practically, however, such models may have limited utility given that many alcohol use decisions occur in social groups when individuals are not sober.

*Age-related changes in alcohol outcome expectancies.* Alcohol expectancies refer to the expectations individuals have for the positive and negative outcomes of drinking alcohol. With age, adolescents become increasingly aware of potential benefits of drinking alcohol and become less convinced of costs or risks (Goldman et al., 1999; Johnson and Johnson, 1996; Maggs and Schulenberg, 1998; Miller et al., 1990). The simultaneous awareness of alcohol's costs and benefits is facilitated by an increased abstraction ability. These normative age-related changes represent a significant challenge for prevention because endorsement of positive alcohol expectancies is a powerful risk factor for alcohol use and misuse (Goldman, 1994).

*Identification of adult hypocrisy.* Children may accept blanket adult statements that alcohol is bad for people under age 21; college students often view such messages as hypocritical, especially when they conflict with common cultural behaviors. As a result, programs and messages targeted at college students need to be realistic about the



ineffectiveness of prohibition approaches. In many contexts, harm reduction approaches should be seriously considered (see e.g., Marlatt, 1998).

#### *Identity domain transitions*

Adolescents and young adults experience fundamental changes in their self-definition and identity (Erikson, 1968; Phinney and Kohatsu, 1997). Ideally, personal identity formation occurs as individuals, through exploration and commitment, develop a secure and enduring sense of self that encompasses an integrated set of personal interests, values, goals and commitments (Nurmi, 1997). Through a process of questioning previously taken-for-granted beliefs and assumptions, older adolescents actively explore alternative philosophies, behaviors and lifestyles. Although identity exploration is associated with instability in well-being, as well as with potentially health-compromising experimentation and risk taking, subsequent identity achievement predicts higher levels of well-being and a lower incidence of health-compromising behaviors (Jones, 1992).

Although identity exploration is normative and healthy, it may represent a risk factor for experimentation with risky behaviors. The role played by alcohol use in adolescents' and young adults' lives is paradoxical. Consistent with the Transition Catalyst Model, despite the possibility of serious harm, drinking also may serve important constructive functions, such as helping to make friends or to explore personal identities (Chassin et al., 1989; Jessor, 1992). As a result, some have questioned the wisdom of attempting to limit experimentation and exploration because this may leave individuals without a self-determined commitment to an identity and to personal values (e.g., Baumrind, 1987; Marcia, 1994).

#### *Affiliation domain transitions*

*Relationships with parents.* The second decade of life is a period of significant reorganization and change in family relationships (Grotevant, 1987). Normative transformations include increased autonomy and independence from parents, ideally in a context of continued support and attachment (Silverberg and Gondoli, 1996). The quantity of interaction often decreases: Older adolescents spend less time in family activities (Larson et al., 1996) and more time in contexts outside the family such as at school, with peers and at work. Despite decreases in the frequency of interaction, the quality of relationships typically improves following the physical departure of the child from the family home (e.g., Aseltine and Gore, 1993; Pipp et al., 1985). Alcohol use tends to increase as adolescents become more individuated from parents (e.g., Baer and Bray, 1999) and as parental monitoring tends to lessen (Barnes et al., 2000).

However, those who internalize positive parental norms may make wiser choices in the long term (e.g., Brody et al., 2000). During college, students continue to seek parental support and assistance in times of stress. Parent support predicts commitment to career development and persistence (Pascarella and Terenzini, 1991). Clearly, students' relationships with parents continue to play a major protective role in promoting their development and success.

*Sibling influences.* Older siblings' substance use predicts early adolescents' alcohol expectancies (D'Amico and Fromme, 1997) and subsequent substance use, above and beyond parental predictors (Duncan et al., 1996; Windle, 2000). Behavior genetic studies also suggest that, unlike many other sibling similarities and parental influences that may reflect passive genotype-environment interactions, sibling similarities in alcohol use involve important environmental effects (e.g., McGue and Sharma, 1995). Mechanisms by which siblings impact substance use may include modeling, direct social influence and access.

*Peer relationships.* Alcohol use is inextricably linked to social relationships with peers. During the college years, many social activities occur in drinking contexts, and these interactions may be facilitated by alcohol. Sociability expressed while drinking can serve as a marker of successful peer relationships and social group bonding (Newcomb and Bentler, 1988; Silbereisen and Noack, 1986). Normative age-related increases in the importance of peer relations and culture heighten exposure to cultural norms and influences that may (or may not) be compatible with the values of the family of origin (Berndt, 1992; Brown et al., 1997). Individuals who move away from home to attend college often become part of a strongly age-graded world. Many cultural myths and norms support a legendary period of partying during the first years of college. However, peer influences are not monolithic in their power or direction of influence (e.g., Brown et al., 1997). Individuals tend to seek out and be selected by peers who have similar goals, values and behaviors (Kandel et al., 1990).

At least three kinds of peer influences may serve as risk factors for increased alcohol use. First, susceptibility to peer influences increases through at least middle adolescence, making individuals more willing to go along with their peers' suggestions (e.g., Dielman, 1994; Steinberg and Silverberg, 1986). The uncertainty of adapting to a new college environment may temporarily exacerbate such tendencies (Caspi and Moffitt, 1993). Second, similarities between adolescents and their friends encourage continuity of behavior over time (Fisher and Bauman, 1988; Kandel et al., 1990). Third, perhaps due to cultural myths, students tend to significantly overestimate the prevalence of drinking on campus. Such inflated "norms" provide a not-so-subtle form of pro-drinking influence, as individuals may want to fit in with perceived group behavior (Baer and Carney, 1993; Prentice and Miller, 1993).

*Romantic and sexual relationships.* The adolescent years bring dramatic changes in sexual feelings and identity, as well as experimentation with romantic relationships and sexual behaviors. Pubertal changes provide the biological foundation for these transformations, but there are equally important cognitive, emotional, interpersonal and social antecedents as well. Brooks-Gunn and Paikoff (1993) identified four developmental challenges for adolescents in the domain of sexuality: becoming comfortable with one's maturing body, accepting feelings of sexual arousal, understanding that sexual behaviors should be mutually voluntary and practicing safe sex. Because these challenges are profoundly personal yet fundamentally relational, involving complex feelings, shared behaviors and sometimes confusing interactions with others, they are likely to remain important developmental tasks during college and beyond.

At age 18, approximately 70% of adolescents have engaged in sexual intercourse (Alan Guttmacher Institute, 1994). The majority of these have had sex with only one partner and do so relatively infrequently. Thus, many have little sexual experience, confidence or skills when they begin college. Coupled with a developmentally normative intense interest in finding a romantic partner, many students' limited sexual experience makes them likely to experience sexual situations that may be unplanned, unreciprocated or nonconsensual. Early in a relationship, safe sex may be unlikely, in part because of a lack of organization, discomfort discussing the issue and fear of implying that a partner is unhealthy.

Alcohol use may be paired with early sexual experiences in several ways. The desire to get to know potential partners may lead individuals to seek out social contexts where alcohol is served, and positive expectancies about the social and sexual enhancement properties of alcohol can increase motivations to drink (Cooper and Orcutt, 1997). Alcohol consumption in turn can make sexual behaviors in general and unsafe behaviors in particular more likely by reducing inhibitions, giving courage and providing an "excuse" for getting wild (Dermen et al., 1998).

Just as new intimate relationships can increase alcohol use, the transition into more committed relationships, such as marriage or even engagement, can decrease it (Leonard and Rothbard, 1999). Indeed, this general "marriage effect" appears to explain normative age-related decreases in alcohol and other drug use (Bachman et al., 1997).

#### *Achievement domain transitions*

Adolescents and young adults face a series of major educational and/or occupational transitions. Successful adaptation to and performance in educational and occupational domains is healthy development. The acquisition of knowledge, critical thought and practical skills helps define concurrent and future optimal development (Clausen, 1991).

In contrast, difficulties in negotiating these critical transitions can contribute to cumulative and emergent health risks.

*School transitions.* Before college, adolescents typically experience transitions to middle school and high school. Embedded in these formal contextual changes are more gradual and subtle alterations, including spending the day with one teacher to moving between classrooms with specialized instructors (Eccles et al., 1993). Postsecondary education takes these shifts further, to classes in multiple buildings with large groups of students, taught by specialized instructors who may not know each other, let alone the students.

The majority of American adolescents attend some form of postsecondary education. College attendance greatly improves lifetime occupational prospects and earnings and, when attended full time, also postpones adult roles such as full-time worker, spouse and parent (Marini, 1987). An extended passage toward adulthood can have many noneducational benefits, including an opportunity to learn, explore ideas and pursue personal and academic interests (Pascarella and Terenzini, 1991). Likewise, individuals can experiment with various behaviors, values and lifestyles. In other words, the college experience can provide a safe haven for exploration, a developmental moratorium (Arnett, 2000; Sherrod et al., 1993).

Transitions to new educational settings require major adaptations that may be stressful but also provide opportunities for a fresh start (Aseltine and Gore, 1993; Eccles et al., 1993; Sher et al., 1996). Thus it is a time of both vulnerability and growth (Compas et al., 1986). Just as the transition to college engenders important changes in students' relationships with their families of origin, peers and romantic partners, it brings dramatic increases in autonomy. For example, for the first time, students have the legal right to privacy of their academic records. As a result of the 1977 federal Family Educational Rights Privacy Act, colleges can release only very limited information about students' educational records even to the students' parents. Recent amendments, however, permit the release of information about alcohol and drug violations for those under age 21.

Cultural norms promote heavy drinking as a rite of passage during the undergraduate years (Prentice and Miller, 1993). Films show large groups of students living together, partying and having a great time. Reputations of campuses as "party" schools are passed formally (e.g., via college guides) and informally among social networks. The desire to make new friends and to participate in the mythical college experience may lead to socially motivated heavy drinking (Transition Catalyst Model) (Cooper et al., 1998; Maggs, 1997). Finally, the stressful aspects of adapting to a new social world and heavier academic demands may also promote alcohol use to help students relax (Overload Model) (Windle, 1992).

*Work transitions.* Paid work is another major achievement transition. During high school, working more hours is associated with higher levels of use of alcohol and other drugs (e.g., Bachman and Schulenberg, 1993; Greenberger and Steinberg, 1986; Mortimer et al., 1996). There is considerable disagreement about the causal direction between work hours and substance use, with one partial explanation involving “third variables” (e.g., disengagement from school) that contribute to increased work intensity and substance use (Bachman and Schulenberg, 1993). Nevertheless, work hours appear to be causally related to increased alcohol use among adolescents (Mortimer et al., 1996). Potential explanations relate to the Overload Model (e.g., stress of balancing long work hours with other activities) and the Developmental Mismatch Model (e.g., most adolescent jobs do not provide developmentally appropriate experiences).

Although part-time work is common during college, little empirical work has examined the relation between work intensity and substance use during college. To the extent that part-time work contributes to additional stress (i.e., the Overload Model), alcohol and other drug use would be expected to increase. In contrast, to the extent that part-time work provides a good match with course work and desired career path (i.e., the Developmental Mismatch Model), substance use might decrease as a function of work.

The transition from school to full-time work is associated with declines in substance use (Bachman et al., 1997; Wood et al., 2000), although this is less true for high school students who go directly to full-time work (Schulenberg et al., 2000). This transition is one defining feature of the transition to adulthood with its concomitant changes in responsibilities, freedoms and contexts. Although this transition is associated with decreased substance use, this decline appears to be impacted more by the transition into marriage (Bachman et al., 1997).

### **Implications for Research and Intervention**

#### *Developmental research on substance use etiology and intervention*

Multiwave, contextually sensitive longitudinal research is essential for gaining a fuller understanding of substance use etiology and intervention (Eddy et al., 1998; Loeber and Farrington, 1994; Schulenberg et al., 2001b). Such data permit researchers to consider complex mediational and reciprocal models linking risk and protective factors with substance use over time (Curran and Muthén, 1999; Rutter, 1994; Windle and Davies, 1999) as well as to identify different (often nonlinear) trajectories of substance use onset and change (Babor et al., 1992; Cloninger, 1987; Zucker, 1987). Short-term, intensive repeated-measures data are valuable for examining processes linking proximal influences such as the transition into college, concurrent risk

factors and substance use. Long-term multiwave panel data are essential for understanding how distal influences relate to proximal ones (e.g., how childhood and adolescent risk and protective factors relate to alcohol and other drug use during college).

A developmental perspective emphasizes the importance of taking a long view on intervention effects (Maggs et al., 1997). Positive short-term effects are important, and enduring salutary effects on developmental trajectories are especially important. Often no measurable improvement in behavior is visible at the conclusion of a preventive intervention (Dielman, 1994), indicating the need for continued assessment, as minor alterations in the slope of a trajectory can result in consequential changes as they accumulate over many years (Kellam and Rebok, 1992; Maggs and Schulenberg, 2001). Long-term intervention research provides opportunities to test etiological theories by altering the constellation of risk factors and observing whether hypothesized changes occur (Coie et al., 1993; Dishion et al., 1999; Kellam and Rebok, 1992; Maggs and Schulenberg, 1998).

#### *Programs and policies regarding college drinking*

Developmental transitions represent windows of opportunity for effecting change. These naturally occurring periods of disequilibrium can be utilized to try to divert previously established risky trajectories and encourage healthy habits, skills and relationships. In this section, we offer a selective list of program and policy implications to help illustrate how developmental considerations can and should come into play when attempting to reduce college drinking. When appropriate, we make reference to intervention implications that follow from the five conceptual models discussed earlier (see Table 1).

*Facilitate developmental transitions.* Going off to college reflects several important developmental transitions in the identity, affiliation and achievement domains. To the extent that difficulties with these transitions contribute to increased alcohol and other drug use, then efforts to assist in successfully negotiating the transitions should translate into less substance use (Schulenberg et al., 2001b). Consistent with the Overload Model, preparing young people in advance of entering college and providing support during the many transitions should serve to increase coping capacities to deal with the stress of multiple simultaneous transitions. Consistent with the Developmental Mismatch Model, ensuring a good match between a young person's expectations about college and what the college experience can actually provide would be beneficial as well. Successful adaptations to transitions are fundamental aspects of development. Although some transitions can be difficult, it is through such challenges that individuals grow, acquiring advanced characteristics competencies. Gaining a better

understanding of how the world works, broader access to social support and greater control over one's social context will likely increase one's ability to avoid or alter detrimental behaviors.

*Intervene at the level of the context and the individual-context match.* Following from the developmental contextual perspective, interventions aimed at altering the context can yield salutary changes in individuals (Maggs et al., 1997). Examples of contextual targets for alcohol intervention include changing social norms (e.g., perceived acceptability of heavy drinking), altering laws and penalties for violations (e.g., legislative changes for parental notification), changing marketing practices (e.g., server training) and providing substance-free housing (e.g., Bennett et al., 1992; Grossman et al., 1994; Perkins et al., 1999; Wechsler et al., 2001). Consistent with the Developmental Mismatch Model, broader-based contextual interventions that attempt to increase the match between individuals and their contexts (e.g., career apprenticeship programs) might also prove effective in reducing heavy drinking and other risky behaviors.

*Balance increased freedoms with increased responsibilities.* A defining feature of human growth is the quest for increased mastery over oneself and the environment (e.g., Harter, 1999; Heckhausen, 1999). This quest requires a balance of increased freedoms and responsibilities, as too much of either can thwart the progression of mastery. Once at college, students may suddenly have more personal freedom than responsibility, and more peers in the same situation, thus providing an opportunity for casual substance use to be transformed into frequent heavy use. Consistent with the Developmental Mismatch Model, the social role ambiguity and transience of this period in life may discourage commitment to social conventions and implicitly encourage heavy drinking by creating an imbalance of increased personal freedoms without parallel social responsibilities. Possible solutions include slowing the pace of increased freedoms (e.g., dorm curfews for first-year students), increasing social responsibilities through community work (see Youniss and Yates, 1997) and involving students in campus governance and discipline.

*Interventions should be varied and developmentally relevant.* Developmentally relevant interventions take into account what is known about normative developmental changes and concerns of a given population. As a group, college students have unique needs simultaneously to build social lives, form romantic and sexual attachments, maintain positive relationships with their families of origin, succeed academically, decide on and progress toward a career and manage their complex daily lives. Thus simple upward extensions of high school prevention efforts are less likely to be effective, whereas programs that incorporate how college students see drinking problems and possible solutions are more likely to be effective. Likewise, consistent with

the Transition Catalyst Model (where drinking is viewed as facilitating transitions), high-quality diversion programs that provide numerous and varied alternatives to drinking for meeting social, romantic and stress-reduction goals are likely to prove effective.

Consistent with the Increased Heterogeneity Model, students with extensive substance use histories before college may be at risk for greater adjustment difficulties in general (e.g., Chassin et al., 1999a). They are unlikely to be influenced by standard prevention efforts, suggesting the need for more intensive targeted interventions (e.g., Darkes and Goldman, 1993). In contrast, for college students on a developmentally limited trajectory of heavy drinking, adjustment problems may be neither a cause nor a consequence of their heavy drinking, and intensive personal interventions may prove counterproductive; instead, high-quality diversion programs or harm-reduction approaches may prove effective (Marlatt et al., 1995).

*Reduce negative consequences of heavy drinking.* Systematic broad-based programs and policy changes may eventually be effective in decreasing the rates of heavy drinking among the nation's college students, and specific campuses may be able to effect more localized change. Nevertheless, given that heavy drinking tends to be culturally embedded in the transition to young adulthood in general, and the college experience in particular, it is unlikely that we will see large reductions in national rates in the short term. This underscores the importance of attempting to reduce the negative consequences of heavy drinking (i.e., harm reduction) (Marlatt et al., 1995). Following from the Transition Catalyst Model, risk taking plays an essential role in identity formation (Baumrind, 1987) and in negotiating peer-related and other developmental transitions (Brown et al., 1997; Chassin et al., 1989). Consistent with the Heightened Vulnerability to Chance Events Model, an adaptive strategy in negotiating the transition to college is to explore one's new contexts and one's identity in relation to the new contexts, a strategy that tends to increase the odds of unpredicted events. Therefore, it is essential to provide students with strategies for successfully managing risky behaviors and negotiating chance encounters with accompanying potential negative consequences.

## Conclusion

For most students, heavy drinking and associated problems tend to peak during college amid the abundance of explicit and subtle expectations and opportunities to drink and then to subside as they move into adulthood roles. This normative shift is quite remarkable: In a few short years, the excessive drinking and concomitant negative consequences experienced by many students that would likely reflect diagnosable alcohol misuse (and often alcohol dependence) at other points in the life span simply run their

course and stop. For other students, heavy drinking becomes troublesome and tragic. By understanding how alcohol and other drug use fits in young people's lives, and specifically how it is embedded in their numerous developmental transitions, we can have a stronger foundation for understanding etiology and for effecting positive change.

### Acknowledgments

The authors thank Patrick Johnson, Robert Zucker and the other members of the Subcommittee Panel for their comments and suggestions on initial versions of this article. We also thank Jeffrey Arnett, Alison Bryant and Deborah Safron for their comments and suggestions, and also Tanya Hart, Virginia Laetz, Patti Meyer and Crystal Pickett for their editorial and production assistance.

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