

2005

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Abstract

This article summarizes a symposium organized by Dr. Elizabeth D'Amico and presented at the 2004 Annual Meeting of the Research Society on Alcoholism in Vancouver, Canada. The four presentations illustrate the importance of creating substance use interventions that are developmentally appropriate for youth. They represent innovative approaches to working with preteens, teenagers, and young adults. Dr. D'Amico's paper describes her research on the development of a voluntary brief intervention targeting alcohol use among middle school students. Findings indicated that by using school and community input, she was able to obtain a diverse sample of youth across grades, sex, ethnicity, and substance use status. Dr. Ellickson's paper describes her research on Project ALERT, a school-based prevention program for middle school youth. Her findings indicate that Project ALERT worked for students at all levels of risk (low, moderate, and high) and for all students combined. Dr. Wagner's Teen Intervention Project was a randomized clinical trial to test the efficacy of a standardized Student Assistance Program for treating middle and high school students with alcohol and other drug problems. The study provided a unique opportunity to begin to examine how development may impact response to an alcohol or other drug intervention. Dr. Turrisi's paper examined processes underlying the nature of the effects of a parent intervention on college student drinking tendencies. Findings suggested that the parent intervention seems to have its impact on student drinking by reducing the influence of negative communications and decreasing the susceptibility of influences from closest friends. Dr. Kim Fromme provided concluding remarks.

Key Words: Intervention, Substance Use, Adolescents, Young Adults.

OVERVIEW

Elizabeth J. D'Amico

THE AVERAGE AGE of onset of alcohol use in the United States is between 12 and 13 years of age, with drinking behavior typically preceding other illicit drug use

(Kandel et al., 1992). Use rates typically increase during the middle school and high school years. For example, recent data from our middle school work indicate that 12% of sixth graders report lifetime use of alcohol compared with 35% of eighth graders. Similarly, youth who reported trying marijuana increased almost 10-fold (2% sixth grade, 17% eighth grade) and cigarette use almost tripled (9% sixth grade, 24% eighth grade) during this time period. Use rates continue to escalate during the teen years, with a large percentage of high school seniors reporting having tried alcohol (77%), marijuana (46%), and cigarettes (54%) in their lifetime (Johnston et al., 2004). By the time youth enter college, one in five reports using marijuana in the past 30 days, 16% report smoking cigarettes daily, and 40% report having five drinks in a row in the past 2 weeks (Johnston et al., 2003a).

Although many youth may experience problems from alcohol or drug use, few actually seek help or treatment. This may be because traditional intervention approaches are not well suited for this age group (Wagner et al., 1999). In fact, most intervention efforts for youth have been adapted from adult or child intervention models (Lonigan et al., 1998), and their appropriateness for youth is presumed rather than known. However, clinical experience suggests that innovative and developmentally appropriate intervention approaches are needed to engage youth. For

example, during middle school and high school, youth typically experience increased peer influence (Simons-Morton et al., 2001), which can impact both substance use rates and their likelihood of obtaining services. College-aged students experience increased independence and decreased parental guidance and support (Schulenberg and Maggs, 2002), which may also contribute to increases in substance use. Therefore, developmental issues must be addressed in intervention programming. This symposium brought together researchers who have developed substance use interventions for middle school youth, high school youth, and college students. Findings highlight the importance of considering developmental factors when creating interventions for these different age groups.

DEVELOPING A VOLUNTARY INTERVENTION FOR MIDDLE SCHOOL YOUTH: PROJECT CHOICE

Elizabeth J. D'Amico and Matthias Schonlau

Adolescents who initiate alcohol use before the age of 14 years are four times as likely to become alcohol dependent compared with those who begin drinking at the age of 20 years or older (Grant, 1998). Approximately one third of high school students (31%) report that they have consumed alcohol before 13 years of age (Centers for Disease Control and Prevention, 1998); therefore, many middle school youth may be at risk for developing future alcohol-related problems. Despite the fact that many teenagers may experience negative consequences from drinking, few adolescents obtain help (e.g., Wu et al., 2002). This may be because many interventions created for adolescents often do not take into account developmental considerations and therefore may not address the important biological, psychological, and social issues for this age group (Weisz and Hawley, 2002).

The current study examined alcohol-related help-seeking behavior among middle school students through the development of a voluntary brief intervention targeting alcohol use. Intervention development occurred in 2003 to 2004 in one middle school ($N = 1344$) in Santa Monica. The conceptual framework used to develop the intervention, Project CHOICE, was guided by a community-based participatory approach (CBPR) (Hohmann and Shear, 2002). Therefore, the expertise of key community stakeholders was incorporated so that the intervention components were consonant with the perspective, values, and social norms of the focal population. The core tenet of CBPR is that the participation of relevant community stakeholders in research processes can increase the external validity of the study and the likelihood that the intervention is sustainable, culturally appropriate, and acceptable to a particular community (Hohmann and Shear, 2002). This involvement increases the relevance and "fit" of the intervention and the feasibility of implementation rather than simply imposing an a priori intervention design. This CBPR approach framed how we applied three well-established intervention

theories, Social Learning Theory (Bandura, 1997), Decision-Making Theory (Kahneman and Tversky, 2000), and Self-Efficacy Theory (Bandura, 1997) to guide our intervention development. We also used a motivational interviewing approach (Miller and Rollnick, 2002) to present the intervention curriculum material, because research suggests that this type of nonjudgmental, interactive approach is successful in helping teenagers to change their drinking behavior (e.g., D'Amico and Fromme; 2002, Monti et al., 1999).

Social Learning Theory suggests that people make assumptions about their environment based in part on their perceptions of others' behavior and attitudes (Bandura, 1977; Maisto et al., 1999); however, these assumptions may not be accurate and may increase risk behavior. For example, overestimation of peer alcohol use is strongly associated with the onset of adolescent drinking (Graham et al., 1991) and escalation to binge drinking (D'Amico et al., 2001). Furthermore, decision making typically involves competing motivations because there are costs and benefits associated with change and keeping with the status quo (Miller and Rollnick, 2002). For example, many teenagers may perceive benefits from alcohol use (Fromme et al., 1997; Goldman et al., 1999), which may make it difficult for them to cut down or stop their drinking. Finally, when people have evaluated the potential risky situation, adequate coping skills are needed to help them make healthier behavior choices. Self-efficacy theory (Bandura, 1997) suggests that people who have more confidence in their ability to change behaviorally are more likely to actually engage in behavior change (DeVellis and DeVellis, 2001; Miller and Rollnick, 2002).

Utilizing this theoretical framework, we developed five sessions for Project CHOICE, which focused on providing normative feedback; challenging unrealistic positive beliefs about substances; resisting pressure to use substances through the use of role playing; discussion of the potential benefits of both continuing use and cutting down or stopping use; and discussion of risky situations and coping strategies, such as getting social support or learning how to avoid certain high-risk situations.

Project CHOICE took place in a group format because group interventions are developmentally relevant for this age group (Brown and D'Amico, 2003). For example, peer influence tends to increase substantially during the middle school years (Simons-Morton et al., 2001) as youth begin to look for reinforcement from their peer group. Although some studies have indicated iatrogenic effects for group interventions with adolescents (Dishion et al., 1999), these groups were comprised of deviant youth. In the current study, however, a variety of teens with different drinking histories self-selected to attend the program.

Before we implemented Project CHOICE in the school setting, we conducted focus groups with the school administration, teachers, and staff and held parent forums to discuss the curriculum. We also pilot tested program con-

tent with approximately 500 students in classroom settings to get feedback on the style and content of the program. We wanted to make sure the program was developmentally relevant for this age group so that youth would choose to attend the program voluntarily. In addition, through both surveys and focus groups with youth, we obtained information on factors that would both hinder and encourage voluntary attendance of the program, such as location, meeting time, and duration of the program. We also used focus groups with school staff and adolescents to gain an understanding of the best ways to market the program. For example, we learned that it was important to students that they not be seen as “bad” or “having a problem” because they attended the program. Therefore, they suggested that we advertise Project CHOICE as a “discussion” or “chat group” versus an “intervention.”

Findings indicated that approximately 10% of the school population voluntarily attended Project CHOICE, with 55% of the participants attending one or two sessions and 45% attending three or more sessions. Of note, students who attended Project CHOICE were demographically representative of the school population on gender, age, and ethnicity. Specifically, Project CHOICE participants were 55% male, with 35% in sixth grade, 34% in seventh grade, and 31% in eighth grade. Project CHOICE participants were also ethnically diverse (33% white, 31% Latino, 7% Asian-American, 2% African-American, 17% mixed ethnicity).

We further compared Project CHOICE participants to those in the school population who did not participate in the program on several characteristics, including deviance, e.g., skipping school or cheating on a test; self-esteem; intentions to use cigarettes, alcohol, and marijuana in the next 6 months; perception of peer cigarette, alcohol, and marijuana use; age of initiation for cigarettes, alcohol, and marijuana; and lifetime and past month use of several substances, including cigarettes, alcohol, marijuana, inhalants, stimulants, ecstasy, and LSD (lysergic acid diethylamide).

Results indicated that Project CHOICE participants were similar to nonparticipants on levels of both deviance and self-esteem. In addition, no differences were found for intentions to use cigarettes or marijuana in the next 6 months. Specifically, 14.1% of Project CHOICE participants said they would use cigarettes in the next 6 months compared with 17.0% of nonparticipants, and 10.6% of Project CHOICE participants said they would use marijuana in the next 6 months compared with 16.4% of nonparticipants. However, fewer Project CHOICE participants (12.9%) reported intentions to use alcohol in the next 6 months compared with nonparticipants (24.4%). No differences were found for perception of peer use, with the majority of both Project CHOICE participants and nonparticipants reporting that none of their friends currently smoked cigarettes (88.2% Project CHOICE participants, 84.5% nonparticipants), drank alcohol (81.2% participants,

76.5% nonparticipants), or used marijuana (88.2% participants, 86.7% nonparticipants). Furthermore, age of onset for cigarettes, alcohol, and marijuana was similar for both groups. In addition, lifetime and past month substance use rates for both Project CHOICE participants and nonparticipants were also similar (e.g., past month marijuana use: 2.4% participants, 3.6% nonparticipants; past month alcohol use: 7.1% participants, 12% nonparticipants, lifetime cigarette use: participants 10.6%, nonparticipants 13.6%). For some substances, Project CHOICE participants' use rates were somewhat lower than use rates of nonparticipants (e.g., lifetime alcohol use: 10.6% participants, 18% nonparticipants), but these differences were not statistically significant. In summary, we found that adolescents who voluntarily attended Project CHOICE were representative of the general school population. Findings also suggested that the program was used as both prevention and intervention. There is anecdotal evidence from the group discussions that many students used Project CHOICE as a way to talk about ways to keep abstaining from alcohol. Furthermore, those who reported current drinking used the program to talk about ways in which they could make healthier choices in the future. One of the most important things we learned from our project is that it is crucial to involve the community in the planning and implementation of school-based programs. We attribute our success in large part to using a CBPR approach and obtaining the support of the school administration, teachers, parents, and students. Because of feedback we received from these different groups, we were able to create a better program and make our intervention more developmentally relevant for middle school youth.

NEW FINDINGS ON CURBING ALCOHOL MISUSE: RESULTS FROM PROJECT ALERT

*Phyllis L. Ellickson, Daniel F. McCaffrey,
Bonnie Ghosh-Dastidar, and Douglas L. Longshore*

Alcohol, tobacco, and other drugs are in the nation's schools, sidetracking youth from getting a good education and from building a solid foundation for a productive, healthy life. Although recent surveys conducted by the National Institute on Drug Abuse show that adolescents are beginning to cut back on substance use, far too many young people are still lighting up, drinking, and getting high for us to think that the nation is winning this battle. According to the 2002 survey (Johnston et al., 2003b), by 8th grade, nearly half of students nationwide had already tried alcohol at least once, followed by cigarettes (30%) and then marijuana (20%). By 12th grade, when adolescents are transitioning into young adulthood (Arnett, 2000), these rates had nearly doubled. Furthermore, many high-school seniors become regular substance users: In 2002, 6% used marijuana daily; nearly 4% drank daily; and 9% smoked at least half a pack of cigarettes each day.

Project ALERT, a state-of-the-art alcohol and other

drug (AOD) prevention program for middle school students, has been designated an exemplary or model program by the Department of Education, the Department of Health and Human Services, and several other public and private organizations. That recognition was based on results from a multisite experimental trial that took place in the late 1980s. Findings from the original study, which involved 30 schools from Northern and Southern California, showed that the program curbed both marijuana and cigarette use—reducing marijuana initiation by 31%, recent marijuana use by almost two thirds, and regular (weekly) cigarette use by one-third to one half (Ellickson and Bell, 1990). However, the program had only a modest effect on drinking, and those gains eroded by eighth grade. In hopes of enhancing the curriculum's effectiveness, particularly against adolescent misuse of alcohol, RAND revised the curriculum. We added a new lesson on alcohol misuse, several home learning opportunities designed to bring parents into the prevention process, and a lesson on smoking cessation. RAND researchers then evaluated the Project ALERT curriculum with a randomized, controlled study in 55 middle schools in South Dakota. This paper summarizes results from this large-scale evaluation, showing that the revised curriculum successfully alters the course of substance use for many youths and even helps high-risk youths.

The Project ALERT Curriculum. Project ALERT is a 2-year classroom curriculum. The program starts with 11 lessons in seventh grade, before significant substance use has taken hold but at a time when students are old enough to benefit from the program. Alcohol, cigarettes, and marijuana are specifically targeted because these three substances are the ones that middle-school youth are likely to try first, putting them at higher risk for more dangerous drug use. The seventh grade lessons are reinforced with three more in eighth grade. The classroom activities are designed to help students identify and resist prodrug pressures and understand the social, emotional, and physical consequences of using harmful substances. The curriculum uses videos and interactive teaching methods, such as guided classroom discussions, small group activities, and intensive role playing, as well as parent-involved homework assignments. Essentially, Project ALERT aims to motivate students against drug use and to give them the skills they need to translate that motivation into effective resistance behavior, an approach that is widely viewed as state of the art in drug-use prevention.

Evaluating the Effectiveness of Project ALERT. The 55 schools, which encompassed more than 5500 students, were randomly assigned to either the ALERT classes or a control group that was exposed to whatever drug prevention measures were in place at their schools. The researchers surveyed all students about their drug-related attitudes as well as their substance use in the fall of seventh grade. To motivate participation in the study and to acquire honest answers to questions, the researchers guaranteed the stu-

dents' anonymity and data privacy. Based on their survey responses, the students were divided into three groups: (1) low-risk students who had never used alcohol, cigarettes, or marijuana; (2) moderate-risk students who had used alcohol or cigarettes once or twice or had not used marijuana but had tried cigarettes; and (3) high-risk students who had used alcohol or cigarettes more than occasionally or had used marijuana. The students were resurveyed in the spring of eighth grade to see whether Project ALERT had made any inroads in their substance use. The analysis sample, which included all students who completed both surveys, included 4726 participants.

Evaluation Results. At the end of the 18-month evaluation, the ALERT students had made major improvements in their substance use compared with the control students. The revised middle school program substantially improved on the original—reducing alcohol misuse as well as cigarette and marijuana use; helping students at all levels of risk (low, moderate, and high); and curbing use among the highest-risk youth, the more committed early smokers and drinkers (Ellickson et al., 2003). Key findings from the evaluation, which compares students from ALERT schools with those from the control schools at the end of eighth grade, include the following.

Alcohol misuse. Among all students, overall alcohol misuse scores (in terms of such problems behaviors as binge drinking, drinking that leads to fights, and drinking that gets the student in trouble) were 24% lower for the ALERT group than for the control group. Moreover, the prevention curriculum was especially successful with the high-risk baseline drinkers, those who had used alcohol three or more times in the past year or at least once in the past month. It reduced by 20% their likelihood of experiencing problems from drinking or of engaging in risky forms of alcohol use. However, although Project ALERT helped youth to avoid risky drinking, it did not keep students from starting to drink or help them to cut back on occasional use.

Cigarette use. Among all students, the proportion of new smokers in the ALERT group was 19% lower. The proportion of weekly smokers decreased by 23%. Among the high-risk early smokers, approximately 20% fewer continued to smoke.

Marijuana initiation. For the lowest-risk students (those who had not tried cigarettes or marijuana by seventh grade), the proportion of new marijuana users was 38% lower in the ALERT group. For the moderate-risk students—those who had already tried cigarettes—marijuana initiation was 26% lower. High-risk students had already started using marijuana before exposure to ALERT and did not reduce their use after program delivery.

Implications. These findings counter critics of school-based prevention efforts who claim that such programs do not affect high-risk adolescents or to curb more than trivial levels of use. Project ALERT worked for all youth and helped the high-risk early drinkers and smokers. These early users have substantially increased risks for increased

drug use and a variety of other high-risk behaviors such as violence, unsafe sex, and dropping out of school. Hence, they are precisely the youth who need help the most. Curbing alcohol and cigarette use among these high-risk youth when they are in middle school may help to prevent the emergence of more serious problems later.

In addition, the effect of Project ALERT on alcohol misuse indicates that school-based programs have important potential for reducing adverse effects related to drinking. The reductions in high-risk drinking and alcohol-related problems such as fighting, impulsive behavior, and school difficulties suggest that programs such as Project ALERT can generate a broad range of public health benefits. The fact that the majority of teenage drinkers are highly likely to misuse alcohol suggests that these programs can help large numbers of adolescents. Few studies have evaluated the impact of middle school drug prevention programs on alcohol misuse. Given the results reported above, the topic deserves further investigation.

The results for this trial have added significance because they expand the variety of environments in which Project ALERT has been proven effective. The original Project ALERT was tested in 30 schools from 8 urban, suburban, and rural communities in California and Oregon. The revised Project ALERT trial, which took place in a Midwestern state with comparatively high rates of alcohol dependence, binge drinking, and current smoking, included more than 40 rural and small-town (as well as urban) communities. Taken together, both trials indicate that Project ALERT works in the Midwest as well as on the West Coast, in rural and small-town communities as well as in urban and suburban environments, and in a region with norms that are highly favorable toward drinking and smoking.

DEVELOPMENTAL CONSIDERATIONS IN CONDUCTING SCHOOL-BASED ALCOHOL INTERVENTION RESEARCH: LESSONS FROM THE TEEN INTERVENTION PROJECT

Eric F. Wagner and Marilyn J. Montgomery

Treatments for adolescents are underrepresented in the evidence-based clinical literature, regardless of the targeted problems and especially in the case of AOD problems (Wagner et al., 1999; Weisz and Hawley, 2002). The overwhelming majority of adolescent treatments that have been reported in the literature were not originally developed for use with teenagers. In a recent review of 14 empirically supported treatments for adolescents, 6 were downward extensions of adult treatments, 7 were upward extensions of child treatments, and only 1 was specifically developed for adolescents (Lonigan et al., 1998). Moreover, age is rarely examined as a moderator variable in intervention studies, and developmental issues are rarely included in the design and evaluation of adolescent treatments (Holmbeck, 2002). Therefore, we do not know whether—or when—development-by-treatment interactions may be occurring.

Because adolescence is a period of tremendous variability among individuals of the same sex and chronological age, dissimilar rates of development are prevalent. Nonetheless, there are some common characteristics of the “typical” 12 to 17 year old that may impact response to AOD treatment. In the cognitive domain (Thomas et al., 1997), adolescents can problem solve by generating hypothetical alternatives, consider the future consequences of their behavior, and weigh the costs and benefits of their actions, all of which have implications for adolescents’ ability to understand and be engaged by treatment. In the interpersonal domain (Arnett, 2000), the increased salience of peer networks can significantly influence treatment response, either positively when peers are supportive of efforts to decrease substance use or negatively when peers are unsupportive of such efforts. In the social-emotional domain (Holmbeck et al., 2000), adolescents desire autonomy and self-determination, and treatments that do not account for this are unlikely to engage and motivate adolescents in the change process. Finally, in the biological domain, adolescence is a time of major growth (e.g., height, weight) and change (e.g., puberty). Such biological changes have been shown to predict drug use among teenagers (Dick et al., 2000); they also may predict treatment response among drug-abusing teenagers. It is most likely the case that cognitive, interpersonal, social-emotional, and biological factors combine to determine the degree to which teenagers respond to substance abuse treatment.

The Teen Intervention Project: Development-by-Treatment Analysis. The Teen Intervention Project (TIP) was a randomized clinical trial funded by the National Institute on Alcohol Abuse and Alcoholism to test the efficacy of a standardized Student Assistance Program for treating middle and high school students ($N = 289$; age range, 13–19 years; 62% white, 20% Hispanic, 14% black, 4% other) with AOD problems. The intervention (treatment condition $n = 180$; control condition $n = 109$) involved 10 weekly sessions, which sequentially presented didactic material, discussion topics, and workbook exercises to (1) educate participants about substance use and abuse; (2) increase participants’ awareness of the reasons underlying their use; (3) understand the antecedents, consequences, and patterns associated with their use from a functional analysis perspective; (4) set and meet goals for reduction or cessation of AOD use; and (5) develop coping skills to manage stress and other factors related to use. The intervention was explicitly designed to incorporate developmentally appropriate practices (Kellough and Kellough, 2003; Roney, 2003) such as self-assessment, opportunities to release emotional stress, role playing, real-life examples, and active and engaging intervention techniques.

Given the range of developmental levels across TIP participants, this study provides a unique opportunity to begin to examine how development may impact response to AOD intervention. In this study, measures available for development-by-treatment analysis included the Perceived Stress Scale (Cohen et al., 1983), the Reckless

Behavior Questionnaire (Shaw et al., 1992), and the Revised Way of Coping Checklist (Vitaliano et al., 1985). Using grade as a crude marker of developmental level, preliminary analyses of the TIP intake assessment data demonstrated significant associations ($p < 0.05$) between developmental level and problem focused coping ($r = 0.25$), “feeling in control” of stress ($r = -0.28$), reckless behavior ($r = 0.12$), and maximum drinks per day—past 30 days ($r = 0.15$). At intake, both average drinks per drinking day and maximum drinks per day were significantly associated ($p < 0.05$) with feeling in control of stress ($r = 0.33$ and 0.21 , respectively) and reckless behavior ($r = 0.23$ and 0.33 , respectively).

These same variables were examined as predictors of changes in substance use from intake to posttreatment separately by treatment condition. Using hierarchical multiple regression analysis, posttreatment days abstinent (30 days) was regressed on (1) pretreatment days abstinent (30 day), (2) grade, and (3) reckless behavior. Reckless behavior was found to predict change in the number of days abstinent among the standard care participants ($p < 0.05$) but not among the treatment participants (Table 1). Results were nonsignificant in regard to the dependent variables of change in average drinks per drinking day, change in maximum drinks per drinking day, and the independent variables of problem-focused coping and perceived stress.

Conclusions and Recommendations. The following conclusions can be drawn from the results of this study: (1) There was significant developmental variation among adolescents enrolled in this treatment study, (2) developmental variation was consistent with what would be predicted (e.g., older adolescents reported more problem-focused coping), (3) the developmental variable “reckless behavior” predicted alcohol use changes among adolescents in the control group but not among adolescents in the treatment group, and (4) other developmental variables included in the study were not predictive of substance use outcomes. The suggestive nature of these findings argues for increased study of the impact of developmental variation on response to treatment, with attention to a broader array of variables and possible interactions among variables.

Such research is extremely rare. It is hampered by the limited and separate frameworks from which developmental research and treatment research are conducted. Despite recent advances in the fields of developmental psychology

and developmental psychopathology, which have provided a rich array of concepts and terms for explaining adolescent phenomena (e.g., Cicchetti and Rogosch, 2002), adolescent AOD treatment research—as well as all areas of adolescent treatment research—has been slow to incorporate developmental principles (Steinberg, 2002). It is also hampered by the blurred boundaries of what is “normal” versus “pathologic” in adolescence (Kendall and Sheldrick, 2000) and by the lack of reliable and valid measures for capturing many aspects of adolescent development (Holmbeck and Shapera, 1999).

When clinical trials of adolescent substance abuse treatment (1) are longitudinal and (2) include indices of developmental level and variables that are developmentally relevant to adolescents (e.g., pubertal status, changes in cognitive developmental level, changes in levels of peer intimacy, autonomy development, changes in parenting behaviors), progress will be made (Holmbeck, 2002). It is of some value to know whether a particular outcome increases or decreases over time, but it is of even greater value to track important outcomes over time (e.g., AOD use and related health risk behaviors such as DWI, sexual risk taking) as a function of changes in important developmental processes. That is, an AOD treatment study becomes developmentally oriented when both development and outcome are measured and tracked over time.

EXAMINATION OF STRUCTURAL MODELS ASSESSING PARENTAL INFLUENCES ON COLLEGE STUDENT DRINKING TENDENCIES

Rob Turrisi and Dale Wright

College alcohol abuse represents a significant public health concern. Abusive consumption tendencies have been estimated as being responsible for approximately 600,000 annual incidences of assault, 500,000 injuries, 70,000 annual incidences of sex abuse/rapes, 72 deaths per weekend, 1 in 4 individuals reporting academic problems, and 1 in 10 showing symptoms of clinical dependence (Hingson et al., 2002).

Recent evidence has revealed that a parent intervention between high school and college can be efficacious in reducing heavy drinking and alcohol-related consequences (Turrisi et al., 2001). This approach is unique in that almost all college prevention efforts are implemented when students are already at college and focus on peers or the college environment. Although there is support for peer and environmental influences on drinking (Borsari and Carey, 2001; Costa et al., 1999), such strategies do not consider evidence that parents retain influence even in young adulthood. For example, college students who report better communication with their parents tend to score higher in psychological health (Amerikaner et al., 1994; Kashubeck and Christensen, 1995). Other reports indicate that adolescents who feel more of a sense of cohesion and better communication

Table 1. Posttreatment Days Abstinent (30 Days) Regressed on Pretreatment Days Abstinent (30 Days), Grade, and Reckless Behavior

Independent Variables	β	R^2 total	$R^2 \Delta$
Control group ($n = 109$)			
Pretreatment days abstinent	-0.077	0.006	0.006
Grade	-0.099	0.049	0.044
Reckless behavior	-0.382*	0.164	0.115*
Treatment group ($n = 180$)			
Pretreatment days abstinent	0.236*	0.057	0.057*
Grade	-0.024	0.058	0.001
Reckless behavior	-0.007	0.058	0.000

* $p < 0.01$.

with their families have an easier time developing new relationships at college (Langhinrichsen-Rohling et al., 1997). Finally, numerous studies link adolescent drinking tendencies and parenting practices (Ary et al., 1993; Barnes and Welte, 1986; Kafka and London, 1991; Reifman et al., 1998; Turrisi et al., 2000).

The current study attempted to examine processes underlying the nature of the effects of a parent intervention on college student drinking tendencies. The research compared structural models for treatment and controls, which examined theoretical relations between individual, peer, and parent influences on drinking outcomes. We hypothesized that positive parental influences would be stronger in the treatment group and individuals and peer influences would be stronger in the control group.

Methods. The sample consisted of 335 freshmen whose parents participated in a parent intervention (treatment group) and 224 freshmen whose parents had no formal contact regarding alcohol prevention efforts (controls) from northwestern and northeastern universities and colleges. The parent intervention was implemented during the summer between high school and the start of the first semester of college. All students completed measures assessing drinking outcomes, individual differences, peer variables, and parental variables approximately 90 days into their first semester in college. (For specific details regarding sampling, procedures, and the format of the intervention, see Turrisi et al., 2001.)

The demographics of the teenage sample were as follows: 44.1% male, 55.9% female; 37.7% liberal, 44.9% moderate, 17.4% conservative; 92% white, 1.4% African-American, 1.4% Asian, 4.1% other; 25.1% Catholic, 10.9% Protestant, 3.8% Jewish, 16.6% Church of Latter Day Saints, 25% other, 18.6 not reporting any religion. Despite that all teenage respondents were below the legal age (mean = 18.12, SD = 0.453, low = 17, high = 19), 60% indicated that they had gotten drunk at least one time in the past year, and 28% indicated that they drank five or more drinks per occasion on a weekly basis.

Drinking tendencies. For the purposes of the model testing, we choose the typical consumption on a Friday and Saturday from the Daily Drinking Questionnaire and the frequency of drunkenness in the past 30 days ($\alpha = 0.89$; Collins et al., 1985; Marlatt et al., 1995).

Individual differences. Three individual difference variables were examined: alcohol expectancies (three items, e.g., "Alcohol adds fun and excitement to an otherwise boring life," $\alpha = 0.805$), self-monitoring (three items, e.g., "Different situations can make me behave like very different people," $\alpha = 0.873$), and compliance (two items, e.g., "How often do you follow the rules your mother sets?," $\alpha = 0.911$).

Peer influences. Three peer influence variables were examined: general drinking norms (five items, e.g., "During the school year, how often do you think that the typical student of your sex drinks alcohol?," $\alpha = 0.845$), close

friend norms (two items, e.g., "On average, how many drinks does your closest friend have at one time?," $\alpha = 0.932$), and peer approval of alcohol consumption (two items, e.g., "How would your closest friends respond if they knew you drank alcohol daily?," $\alpha = 0.730$).

Parental influences. Five parental influence variables were examined: parental approval (three items, e.g., "My mother doesn't mind if I drink alcohol once in a while," $\alpha = 0.898$), monitoring (three items, e.g., "How often do you tell your parent(s) where you're really going when you go out at night?," $\alpha = 0.870$), positive communication practices (three items, e.g., "My mother gives criticism in a constructive positive way," $\alpha = 0.811$), negative communication practices (four items, e.g., "My mother turns everything into a debate of me versus you," $\alpha = 0.788$), family history of alcoholism (four items, e.g., "Has you mother of father ever been fired from a job because of his or her drinking?," $\alpha = 0.838$).

Results and Discussion. The focus of the analyses was to examine processes underlying the nature of the effects of parent intervention on college student drinking tendencies by comparing structural models for the treatment and control groups. The assessment of different models for the two groups is analogous to testing for an interaction effect. Following the recommendations of Jaccard and Wan (1996), we regressed latent constructs representing each of the individual difference variables (alcohol expectancies, self-monitoring, compliance), peer variables (general drinking norms, close friend norms, peer approval of alcohol consumption), and parent variables (parental approval, monitoring, positive communication practices, negative communication practices, family history of alcoholism) onto a latent construct for drinking tendencies with use of a multiple-groups solution in AMOS (SPSS Inc., Chicago, IL). Although the χ^2 and other fit indices were all suggestive of good model fit for both the treatment and control groups (e.g., CFIs both > 0.950 , RMSEAs < 0.04 , p test results of close fit both nonsignificant), we observed a significant difference between the models ($\chi^2_{treatment\ model} = 582$, $df = 563$, $p = 0.281$; $\chi^2_{control\ model} = 648.87$, $df = 563$, $p < 0.08$; $\chi^2_{difference} = 66.87$, $df = 1$, $p < 0.05$). Examination of the regression paths in the structural models in Table 2 revealed significant paths between alcohol expectancies,

Table 2. Regression Coefficients for Treatment and Control Groups

	Treatment Group	Control Group
Alcohol expectancies	1.88*	1.88**
Self-monitoring	-0.264	-0.251
Compliance	0.181	0.207
Peer approval	0.224	0.263
Close friend norm. perceptions	0.220	0.440*
Generalized norm. perceptions	0.741**	0.993**
Parental approval	0.313*	0.411*
Parental monitoring	0.341	0.374
Positive communication	-0.668*	-0.936**
Negative communication	-0.523	-0.931**
Family history of alcohol	-1.13	-1.24

* $p < 0.05$; ** $p < 0.01$.

generalized norms, parental approval, and positive communication and drinking tendencies in the anticipated directions. However, we also observed differences between the treatment and control groups in terms of peer and parental influences. For the control group, we observed significant positive relations between negative parent communication and student drinking tendencies and closest friend drinking and student drinking tendencies. Neither of these relations was observed to be significant for the treatment group. Therefore, as negative communications between parents and teenagers in the control group increased, student drinking increased. Similarly, as closest friend drinking increased in the control group, student drinking increased. This suggests that the parent intervention seems to have its impact on student drinking by reducing the influence of negative communications and decreasing the susceptibility of influences from the closest friends. These findings, however interesting, must be interpreted with caution. Although we tested for differences between treatment and control groups, we did not have control over the extent of the communications that parents had with their teens. Perhaps there were fewer negative communications in the treatment group, or there might have been the same numbers of negative communications but stronger in magnitude in one group relative to the other. The same argument can be made for the nature of the communications regarding close friend drinking. In either case, the findings do point to the benefits of continued examination of parent-based interventions to help reduce alcohol abuse and alcohol-related problems in first-year college students.

DISCUSSION AND CONCLUSIONS

Kim Fromme

The four interventions described in this article represent timely research on novel and developmentally sensitive interventions. With an acute recognition that one size does not fit all, these interventions were specifically designed with the target populations in mind. Appropriate measures for the adolescent and young adult participants were used, and the researchers involved the relevant constituencies in the development of their programs. Through focus groups and feedback from potential consumers and those individuals who would deliver the programs, the interventions were crafted to maximize participation and efficacy. Last, a sound theoretical framework provided the basis for all four studies. This discussion will briefly highlight the findings from these studies, comment on the developmental factors that were addressed in the projects, and outline additional factors that might be explored in future interventions for middle school, high school, and college students.

Summary of Findings. Dr. D'Amico discovered creative ways to market and engage youth in Project CHOICE. Her research demonstrated that the majority of middle school students would choose to participate in an intervention about alcohol and other substances, especially when it was

marketed as a "discussion group." Dr. D'Amico also illustrated the importance of involving the community, including teachers, parents, and students, when developing and testing interventions for middle schools.

In Project ALERT, Dr. Ellickson also used teacher feedback to refine and improve AOD prevention programs for middle school youth. A controlled study showed that Project ALERT helped to reduce both initiation and recent use of marijuana and cigarettes, whereas the effects for alcohol use were not as robust or long lasting. By putting more emphasis on alcohol misuse and promoting parental involvement, however, a second outcome investigation indicated that Project ALERT reduced alcohol misuse as well as cigarette and marijuana use.

With the TIP, Dr. Wagner tested a Student Assistance Program for substance use and abuse among middle and high school students. This research was unique in the effort to identify developmental variables that might moderate response to the intervention. Whereas alcohol use was reduced over time for both the TIP and control groups, the association between reckless personality traits and drinking was reduced only among TIP participants. Dr. Wagner's findings illustrated the significant variability among adolescents in school-based interventions and called for continued efforts to identify moderators and mediators of intervention efficacy.

Taking the novel approach of a parental intervention for matriculating college students, Dr. Turrisi was effective in reducing negative drinking outcomes and increasing family communication about use. By educating their parents about the incidence and consequences of college alcohol use and providing specific strategies to improve parent-teenager communication, college student drinking was decreased during the first year of college. This research underscored the value of involving parents and other significant others in the design of college prevention programs.

Overview and Future Directions. The interventions described in this article are exciting evidence that we have moved beyond the use of ineffective approaches such as Drug Abuse Resistance Education and Alcohol Awareness programs in our efforts to curb the problem of alcohol and substance use and abuse among youth. The interventions also serve to highlight the importance of developmental factors as students transition from middle school to high school and to college. Because it may be "uncool" to take part in alcohol and drug prevention programs, efforts must continue to be made to increase student motivation for participation, and once engaged, programs must improve the maintenance of changes in youth behavior. This may be best accomplished by identifying specific developmental factors that mediate or moderate behavior change across these transitions.

Potentially important factors in the transitions from middle school, high school, college, and beyond include personal motivations, legal and environmental milestones, and cognitive development. Shifts in youth's emphasis on pa-

rental approval, peer acceptance, and academic success may greatly influence their substance use and willingness to participate in prevention programs (Schulenberg et al., 1999). By capitalizing on such natural developmental trends, prevention programs might better engage and affect changes among youth.

Several significant legal and environmental milestones also occur during the years between middle school and college graduation and can have a major influence on substance use and other risk behaviors. Acquisition of one's driver's license, for example, is a rite of passage among teenagers that is often associated with increased risk taking as personal freedoms are extended. Reaching the legal drinking age of 21 years in the United States also tends to be marked by increased frequency of alcohol use but fortunately a decrease in quantity of consumption (Mooney et al., 1987). Leaving a more controlled environment of middle school for a less restrictive high school environment can also contribute to increases in alcohol and other substance use among youth. Likewise, the transition from high school to college is often marked by a dramatic decrease in adult supervision and associated increases in personal freedom for students. All of these legal and environmental changes may lead to increases in substance use, but they also represent windows of opportunity for the design and implementation of developmentally relevant interventions.

Last, important changes in brain development and cognitive processes occur during the years between middle school and college. Executive cognitive function, social information processing, and decision making underlie substance use behavior and offer targets for novel and potentially effective interventions for youth. This is a time of unprecedented advances in our understanding of brain mechanism and function. Interventions of the next decade can benefit from this new knowledge to design more effective and enduring interventions for youth.

In conclusion, the interventions described in this article illustrate exciting new directions in alcohol and substance use interventions for youth. The one-size-fits-all mentality has clearly been replaced by respect for and efforts to harness developmental factors that may contribute to alcohol and other substance use, abuse, and prevention.

ACKNOWLEDGMENTS

The authors thank Mary Lou Gilbert, who coordinated the project. They also acknowledge the support of the Santa Monica School District and the two middle schools where this research was conducted and thank the principals and PE departments whose support made this project possible.

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