

Interactive Effects of Individuation, Family Factors, and Stress on Adolescent Alcohol Use

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A prospective, school-based study of increasing alcohol use in a multi-ethnic sample of 7,540 adolescents showed that the effects of stress, family conflict, and parental monitoring were differentially moderated by two modes of individuation. The effects of stress were moderated by ethnic status and individuation. Implications for prevention and intervention are discussed.

Adolescent alcohol use and abuse continues to be a major health risk for our nation's youth. The increase in substance use persists, and there is no clear understanding of why it does (Johnston, O'Malley, & Bachman, 2000; Nelson, Heath, & Kessler, 1998). Despite repeated efforts to decrease the onset and use of alcohol, adolescents continue to experiment with and abuse alcohol, which may set the stage for a life-long pattern of alcoholism or alcohol abuse (Nelson et al., 1998; Segal & Stewart, 1996; Tarter & Vanyukov, 1994).

Experimentation with alcohol appears to follow adolescent development, with increases in usage as adolescents mature (Johnston et al., 2000; Kandel & Logan, 1984; McLaughlin, Baer, Pokorny, Burnside, & Fairlie, 1985). The central psychological developmental processes during that time period include individuation, autonomy, intimacy, and identity formation. Experimentation with alcohol and other substances appears to be related to these adolescent developmental processes. However, alcohol use can easily lead to a pattern of alcohol abuse (Botvin & Tortu, 1988; Nelson et al., 1998; Tarter & Vanyukov, 1994). Adolescent substance abuse can lead to impairment in cognitive, moral, and psychosocial domains; amotivational syndrome; defects in identity development; and so-

cial alienation (Baumrind, 1985; Baumrind & Moselle, 1985). Further, it is related to significant psychopathology, such as externalizing problems and posttraumatic stress disorder (Giaconia et al., 2000). Thus, it is imperative that researchers understand the factors that affect the progression of adolescent alcohol use.

The developmental process of individuation has recently been identified as an important component in understanding adolescent alcohol use (Baer & Bray, 1999; Bray, Adams, Getz, & Baer, 2001; Bray, Baer, & Getz, 2000). The individuation process occurs across the life span and has a central role during adolescence (Josselson, 1980). Individuation develops from the external social pressures to be independent and autonomous and the internal maturational urges during this life cycle. There are multiple theories and views of the individuation process, and individuation is perhaps best conceptualized as a multidimensional domain, rather than a unidimensional construct (Silverberg & Gondoli, 1996; Steinberg & Silverberg, 1986). Blos (1962), using psychodynamic theory, described the adolescent tasks of individuation as making autonomous those aspects of self which are "enmeshed" with parents. Further, emotional detachment and separation from family influences are central in the indi-

A revised version of a paper submitted to the Journal in November 2000. Research was supported by grant RO1-AA08864 from the National Institute of Alcoholism and Alcohol Abuse. Authors are at the Department of Family & Community Medicine, Baylor College of Medicine, Houston, Texas.

viduation process and are believed to result in healthy adjustment and increased personal responsibility (Blos, 1962). Ego development theory views the individuation process as a part of personality formation in which an adolescent develops an integrated and coherent identity (Josselson, 1980). Karpel (1976) conceptualized individuation as both an intrapsychic and interpersonal process that leads the person to see self as separate and autonomous in relation to significant others. The process of adolescent individuation includes idealizing parents, being less dependent on parents, and seeing parents as people with strengths and weaknesses (Steinberg & Silverberg, 1986).

While the above theories conceptualize individuation as an intrapsychic process, family systems theories focus on the interactional aspects of the individuation process within the family context (Bowen, 1978; Williamson & Bray, 1988). From this perspective, adolescents are part of interactional processes that regulate individuation as a function of the family's level of differentiation (i.e., psychological and emotional distances between family members, which determine patterns of family cohesion, adaptability, and emotional fusion). Integrating autonomy, differentiation, and intergenerational connectedness in the family is viewed as adaptive and beneficial for the adolescent (Harvey & Bray, 1991).

Individuation reflects one's capacity to operate in an autonomous and self-directed manner without being controlled or impaired by, or feeling undue responsibility for, significant others. It is not synonymous with emotional distance or separation from family members, but it reflects one's ability to have a close, intimate relationship with family members, while maintaining distinct boundaries to the self. Intergenerational individuation describes this process between an individual and his or her parents (Williamson & Bray, 1988). The opposite pole of individuation is emotional fusion or separation. This reflects relationships that are characterized by emotional reactivity, interpersonal tension, and unhealthy detachment, as well as the tendency to avoid taking responsibility for one's self. The level of emotional fusion and separation reflects the degree of unresolved attachment to the family of origin. Family systems theorists argue that individuation is a key factor in understanding individual and family health, illness, and symptom formation (Bowen, 1978; Harvey & Bray, 1991; Kerr, 1981; Williamson & Bray, 1988).

Accurate description of the components of successful adolescent individuation is necessary to investigate its role in the development of alcohol use patterns. While there is overlap in the various theories of individuation, recent research has questioned the psychoanalytic premise that emotional detachment and independence from the family are critical to healthy individuation (Silverberg & Gondoli, 1996). It is proposed that separation or detachment from the family, which is often experienced as a lack of parental support and acceptance, interferes with the process of individuation (Ryun & Lynch, 1989). These research findings suggest that individuation may not require a cut-off or retraction from family relationships, but the development of a balance between individuality and connectedness in the family (Grotevant & Cooper, 1985; Rice, Cole, & Lapsley, 1990; Williamson & Bray, 1988).

Contrary to the earlier views of pervasive rebelliousness and rejection of family emotional relations, adolescents with healthy individuation usually report maintaining strong family attachments, while simultaneously developing autonomy (Silverberg & Gondoli, 1996). Adolescents undergo a transformation of parent-child relations from dependency and less idealization of parents to more autonomy and individuation. Measures of these processes, such as emotional autonomy (Steinberg & Silverberg, 1986), psychosocial maturity (Greenberger, Josselson, Knerr, & Knerr, 1974), or intergenerational individuation (Bray & Harvey, 1992), have led to increased research in the area, but have resulted in controversies regarding interpretation of aspects of the domain. A central controversy has to do with the finding that the separation component of individuation appears to represent detachment from the family and is associated with deviance rather than healthy maturation (Turner, Irwin, & Millstein, 1991). Alternatively, individuation that integrates autonomy, differentiation, and intergenerational connectedness in the family is adaptive and beneficial for the adolescent (Harvey & Bray, 1991). In addition, adolescent individuation appears to be affected by other social and family processes, such as stress, family conflict, and parenting.

Accounting only for a person's level of individuation is not sufficient to predict problem or symptom formation, such as alcohol use and abuse. Knowing the amount of life stress is also required because it is believed that stress interacts with indi-

viduation to determine symptom development (Bowen, 1978; Williamson & Bray, 1988). Stress may come from family conflict, external life events, and family life-cycle changes, such as the adolescent transition. The impact of stress on health and symptom development is well established, and factors such as family and developmental processes are known to buffer or decrease the negative impact of stress (Cohen & Wills, 1985; Harvey & Bray, 1991; Neff, 1993; Wills & Cleary, 1996). It is argued that the higher the level of individuation, the more stress it takes before someone will develop symptoms or engage in unhealthy behavior (Bowen, 1978; Williamson & Bray, 1988). In addition, a more individuated person will "bounce back" more quickly following a stressful event than a less individuated person. Symptoms are considered expressions of the way individuals respond to stress, given their basic level of individuation (Kerr, 1981).

Research has demonstrated a relationship between substance use/abuse and the process of individuation (Baer & Bray, 1999; Bray et al., 2000; Spotts & Shontz, 1985; Stanton & Todd, 1982; Weidman, 1987). Substance abuse is viewed as partially a result of difficulties with the individuation process, and of emotional isolation and lack of differentiation (e.g., an emotionally fused or triangular relationship between adolescent and parents) that interfere with the adolescent's separation-individuation process. Evaluations of this model with cross-sectional samples of a broad age range of adolescents from different ethnic backgrounds provided support for the role of individuation influencing alcohol use (Baer & Bray, 1999; Bray et al., 2000). In previous work using structural equation modeling, Bray and colleagues found that, in the context of family and peer factors, individuation has small direct effects on adolescent alcohol use, and larger indirect effects through stress and friend and peer alcohol use. Further, it was found that different aspects of individuation had different kinds of effects on adolescent alcohol use. Namely, intergenerational individuation operated as a protective effect to predict lower alcohol use, while separation functioned as a risk factor for increased alcohol use. However, it is important to understand how individuation and stress interact over time in their influence on youths' drinking.

Parenting is another key factor that helps prevent adolescents from engaging in problem behaviors. Parenting encompasses several factors such

as discipline, warmth, and control. However, parental monitoring of adolescent behavior has emerged as a central factor that influences the occurrence of problem behavior for children and adolescents (Coombs & Landsverk, 1988; Dishion & McMahon, 1998; Hetherington & Clingempeel, 1992; Steinberg, 1987). Parental monitoring includes awareness, watchfulness, and supervision of the multiple areas of an adolescent's life, which include friends, school, and behavior at home (Dishion & McMahon, 1998). Parental monitoring has been identified as an important influence on general adolescent behavior, with some links to the prevention of adolescent alcohol use and abuse. However, the effects of parental monitoring over time, and its relationship to the individuation process, have not been adequately investigated.

This study examines how the interactions between two aspects of individuation (separation and intergenerational individuation) and family conflict, stress, and parental monitoring, are related to changes in adolescent alcohol use over a three-year period. It is hypothesized that higher levels of stress and family conflict and lower levels of parental monitoring will be associated with the largest increases in alcohol use when there are high levels of separation reported. In contrast, it is hypothesized that, with low levels of intergenerational individuation, high stress and family conflict and low parental monitoring will predict increases in youths' drinking. It is hypothesized that these relationships will operate similarly for boys and girls and across different ethnic groups. Hierarchical linear models using growth curve analyses provide an excellent method to examine changes in these relationships across the three-year period (Bryk & Raudenbush, 1992; Duncan, Duncan, & Hops, 1996).

METHOD

Participants

The sample for this study included 7,540 participants. The study used data from a three-year longitudinal sample, which included subjects measured from one to three occasions. The number of subjects with a single measurement was 1,173. There were 3,636 subjects with measurements at two time periods and 2,731 had measures at three time points. The adolescents were surveyed in five school districts in the Houston, Texas, metropolitan area. Three cohorts of students starting in the sixth, seventh, or eighth grades were tracked for

three years. Participants for this report included a total of 2,338 students from the sixth (31%), 2,648 students from the seventh (35%), and 2,554 students from the eighth (34%) grades. Participants were 51% females. The subjects represent three ethnic groups, white non-Hispanics ($N=2,924$; 39%), Mexican Americans ($N=2,878$; 38%), and African Americans ($N=1,738$; 23%). Ethnic representation was similar across grade levels. The family structures of the adolescents were first marriage families (60%), stepfamilies (16%), single-parent families (14%), and other family groups (10%). Mothers' educational status was: 29% less than high school, 29% high school graduates, 19% with at least some college preparation, and 23% college graduates.

The effects of attrition were assessed by recommendations from Tabachnik and Fidel (1989) to determine if subjects who were not present for all of the waves were significantly different than those who stayed in the study. In the first analysis, subjects' frequency of alcohol use was regressed upon ethnic status, grade, sex and non-intact family. A second analysis added a dummy coded variable signifying cases missing from waves two and three. Inclusion of this variable had no significant effect upon the beta weights of the aforementioned demographic predictors. In the second set of analyses, frequency of subjects' alcohol use was first regressed on separation, intergenerational individuation, family conflict, or family cohesion. A second equation adding the dummy coded attrition variable again resulted in no substantive change in the magnitudes of the other predictors. Also, there were no instances in which the attrition variable interacted with any of the demographic variables in predicting frequency of alcohol use. Next, the attrition group was compared with the longitudinal sample via a structural equation model test of the model's invariance. This comparison was done twice—once using separation as the measure of individuation, and again using intergenerational individuation as the measure. For both tests the fit was good (NNFI=.95, CFI=.97, GFI=.98), thus demonstrating that the covariance matrix for the attrition group is not substantively different from that of the longitudinal sample.

Instruments

Sociodemographic Items. These items included measures of mothers' education, family structure, ethnicity, age, and gender.

Separation. Nine items from two subscales of the Emotional Autonomy Scale (Steinberg & Silverberg, 1986) were employed to measure this variable. Factor analysis of the EAS revealed that items reflecting nondependence on parents and parental deidealization loaded together as a direct predictor of alcohol use (Baer, Bray, & Getz, 1994). Representative items are: "I try to have the same opinions as my parents," and "If I have a problem with one of my friends, I would rather discuss it with my mother or father before deciding what to do about it." Some researchers (Ryan & Lynch, 1989; Silverberg & Gondoli, 1996) have suggested that these subscales are better conceptualized as measures of separation or detachment than they are as measures of emotional autonomy. Higher scores on our indicator reflect more separation. Steinberg and Silverberg (1986) reported good internal consistency for the EAS (Cronbach's $\alpha=.75$). The Cronbach's α in the current sample is .87.

Intergenerational individuation. This variable is measured by a subscale of the Personal Authority in the Family System Questionnaire (Bray & Harvey, 1992; Bray, Williamson, & Malone, 1984). In this context, individuation reflects a capacity to take responsibility for the self without being impaired by dominating parents. It also reflects autonomy in the context of positive emotional relationships with parents. A low score on the PAFS-Q reflects emotional fusion indicating lack of responsibility for one's self and impaired functioning. Representative items are: "I worry that my parents need me to take care of them," and "I get so emotional with my parents I can't think straight." Internal consistency for this scale is good (Cronbach's α range .73–.83). Test-retest reliability over two weeks has been reported as .75 (Bray & Harvey, 1992; Bray et al., 1984). For the current sample, Cronbach's α is .75.

Although hypothesized to load on one factor (Baer & Bray, 1999), confirmatory factor analysis suggested that these measures do not reflect a single construct either across or within ethnic groups (Bray et al., 2000). Therefore, the scales were employed as different measures within the domain of individuation. In the current investigation, the correlations across the first, second, and third waves of data were -.29, -.39, and -.43, respectively. Such findings are consistent with the suggestion that individuation constitutes a multidimensional domain (Silverberg & Gondoli, 1996).

Family conflict. This nine-item measure was drawn from the Family Environment Scale (Moos & Moos, 1981). The FES items reflect the degree of anger and aggression overtly expressed among family members. Representative items are: "We fight a lot in our family," and "Family members sometimes hit each other." Higher scores reflect more family conflict. Moos and Moos reported good internal consistency and two-month test-retest reliability (.75 and .85 respectively). Cronbach's alpha for the current sample is .94. Predictive, concurrent, and construct validity is well established for the FES (Moos, 1990).

Stress. Thirteen items drawn from Coddington's (1972) Life Events Scale for Children were used to measure stress. Three researchers independently judged these items nonredundant and salient for the lives of young adolescents (Baer, Garnezy, McLaughlin, Pokorny, & Wernick, 1987). The items are rated on their occurrence, and then on how stressful they are, on a five-point scale. Previous research has employed both life events and daily hassles as predictors of adolescent substance use. Baer et al. (1987) demonstrated that, when frequency of occurrence is considered, the life events measure is a more consistent predictor of alcohol use. Representative items are: "Parents separated or divorced," and "Death of someone close." Stress scores are computed as the average across the 13 items on a five-point Likert scale. Higher scores reflect more stress. Cronbach's alpha is .74 in the current sample.

Parental monitoring. The adolescent version of the Assessment of Child Monitoring scale was used to measure parental monitoring of adolescents. The items are based on previous work by Patterson (1982) and Baumrind's (1991) parenting scales (Hetherington & Clingempeel, 1992). Representative items are: How much does your mother know "who your friends are and what they are like," and "what you do with a boyfriend or girlfriend"? The scale includes seven items with higher scores indicating more parental monitoring. This scale has been confirmed through factor analysis and it significantly correlates with behavioral observations between parents and children on similar dimensions (Hetherington & Clingempeel, 1992). The internal consistency (Cronbach's Alpha) for parental monitoring ranges from .70 to .76 and the two-month test-retest reliabilities range from .68 to .81 (Hetherington & Clingempeel, 1992). In the current sample the alpha is .81.

Adolescent alcohol use. The index of alcohol usage employed here was derived from work by Baer, Garnezy, McLaughlin, Pokorny and Wernick (1987), which was based on items developed by Jessor and colleagues (Jessor & Jessor, 1977; Jessor, Donovan, & Costa, 1991). First, three items measuring frequency of beer, wine, and liquor consumption on a six-point Likert scale were summed. Scores ranged from 0 (have never drunk) to 5 (more than 20 times in the past month). This component of the index was weighted such that low-frequency initiators of two or three of the three beverages were not coded as moderately high frequency users. Next, the sum was multiplied by the score on a five-point quantity scale ranging from 1 (nothing, I never drink) to 5 (six or more drinks on one occasion). The resulting index ranges from 0 to 75, with greater consumption reflected by higher score. A score of 1 on the index would indicate that the subject had initiated but had not drunk in the past month. A score of 12 would indicate consumption of at least one type of beverage once or twice in the past month at a one to two drink quantity. A score of 15 would indicate a consumption frequency of three to five times in the past month at a consumption quantity of six to twenty drinks on each occasion. A score of 75 would indicate consumption of multiple types of beverage more than twenty times in the past month at a consumption quantity of six to twenty drinks on each occasion. Alcohol usage among our sample is slightly higher than that reported for similarly aged adolescents by other researchers (Johnston, O'Malley, & Bachman, 1995). Reliability and validity of adolescent self-reports of substance use are supported in the literature. Two studies found that the bogus pipeline did not affect such self-reports (Campanelli, Dielman, & Shope, 1987; Murray & Perry, 1985); numerous other studies suggest their reliability and validity (Hill, Dill, & Davenport, 1988; O'Malley, Bachman, & Johnston, 1983; Needle, McCubbin, Hamilton, Lorence, & Hochhause, 1983).

Measurement development. The measures used in this study were originally developed primarily with samples of non-Hispanic white, middle-class subjects and were not psychometrically examined for other ethnic groups. The reliability and validity of the items could be influenced by ethnic and cultural differences. This could lead to spurious relationships or differences due to methodological problems with the measures. To avoid these poten-

tial problems and to make the measures more comparable across ethnic groups, they were evaluated and modified using a series of strategies. First, experts in minority studies and students from the various ethnic backgrounds reviewed the items to ensure that they properly represented the domains of interest. Second, item response theory (IRT) methodology (Thissen, 1991) and confirmatory factor analysis (CFA) were applied to the measures. Using IRT methodology, comparable measures for the ethnic groups were developed by deleting or modifying some items, and adjusting the response range of some measures (Hulin, Drasgow, & Parsons, 1983). The response range for the individuation, family conflict, and parental monitoring measures were all made into five-point Likert type scales. The revised scales were tested using CFA and found to be comparable across ethnic groups. (A more complete description of the IRT and CFA analyses can be obtained from the first author.)

Procedures

Subjects were recruited from junior and senior high schools in five area school districts. A passive parental consent procedure was used in four of the school districts. This procedure resulted in approximately 99% of the eligible students present in school that day available for the first survey. In the fifth school district, parents had to give written, active consent prior to student participation. In this school district, approximately 60% of the eligible students participated in the first survey. There were no differences on the measures between the students in the active and passive consent schools. Prior to administering the survey, a project staff member read a protocol to the students, explaining the study's purpose and indicating that participation was voluntary. To preserve confidentiality, the staff person conducted the survey and answered any questions that students had, thus avoiding contact from the classroom teacher during the period.

All students present and eligible for participation were given the above instruments in a classroom setting during regular school hours. Students were surveyed annually over a three-year period. Due to funding and school district restrictions, only students present on the day of the survey participated at each sampling period. Students who were absent or who had withdrawn from school were not surveyed. In addition, school district re-

strictions precluded inquiring about some factors associated with substance use, such as sexual behavior and orientation. Participants and their parents were told that their responses would be confidential and only the research team would see their individual responses, and they were informed about a federally issued Certificate of Confidentiality. Identification codes were used to assure confidentiality. Neither schools nor parents had access to the individual student data. Students were not given any compensation for participating in the study.

Data Analytic Methods

Hierarchical linear modeling (HLM) was used to examine the relationships between individuation and family process and stress on changes in alcohol use over the three-year period. HLM models are useful methods for studying individual change in longitudinal designs (Bryk & Raudenbush, 1992; Francis, Fletcher, Stuebing, Davidson, & Thompson, 1991). Typically, there are two or more levels in a HLM model. In the first level, the repeated observations from each individual are regressed against the predictor values of each individual. This first part of the process is termed Level 1, or the within-subjects portion of the model. This regression produces coefficients (typically slope and intercept coefficients) for each person in the analysis. In the second level of the HLM model, the coefficients from the first model are used as dependent variables in a subsequent model. The coefficients are regressed against factors that differ across subjects, such as gender. Since each individual's data are modeled separately, this type of analysis is well suited to repeated measures data, and is often referred to as growth curve modeling. The second portion of the model is termed the Level 2, or between-subjects part of the model. Conceptually, it is helpful to think of the processes separately; however, in actuality, both phases of the model are calculated simultaneously. In the first phase, since each individual's data are modeled separately, the procedure allows for factors that can change over time. For example, if an individual has two or three repeated measures of stress or family conflict, these factors may differ over the time the individual is studied. These types of factors are called time-varying covariates.

In these analyses, two level models were used. A model that contained gender at level 2 was tested;

however, as hypothesized, gender was not found to be a helpful predictor and was dropped from further analyses. A model that contained ethnicity at Level 2 was also tested. The models tested had time as a random effect; separation, intergenerational individuation, stress, family conflict, and parental monitoring as nonrandom, time-varying covariates; and ethnicity as a Level 2 effect. In addition, mother's education was included as a control variable for socioeconomic status. These measures were treated as nonrandomly varying because it is believed that their influence on alcohol use will not individually vary, but will act as developmental and family processes across all adolescents. By using these variables as time-varying covariates, we can answer a number of important questions related to alcohol usage, such as: How is the interaction of individuation and stress related to alcohol usage over time?

RESULTS

TABLE 1 presents the means and standard deviations for adolescent alcohol use, intergenerational individuation, separation, family conflict, stress, and parenting for each time period by ethnicity of adolescent. The initial analyses included gender as a Level 2 factor. However, these analyses indicated that, while boys drank more alcohol over time than girls ($t(6652)=4.22, p<.001$), gender did not interact with any of the factors. This indicates that the relationships are similar for both boys and girls. Thus, gender was dropped from the following analyses.

A series of HLM analyses were run to examine the effects of changes in the independent variables and interaction terms on changes in alcohol use. We did not hypothesize three-way interactions. As in multiple regression, the effects of a particular variable are considered in the context of the other variables. Because of multi-collinearity problems, a model with all the variables and their interactions could not be run (Bryk & Raudenbush, 1992). Thus, separate models were run for intergenerational individuation and separation with combinations of protective and risk factors. To assess a variable's effects on a dependent variable, it is important to examine the change in chi-square. Addition of the interaction terms resulted in significant changes in chi-square for separation and stress, $\chi^2(3)=35.48, p<.001$; for separation and family conflict, $\chi^2(1)=15.99, p<.001$; for separation and parental monitoring, $\chi^2(1)=10.54, p=.001$; and for intergenerational individuation and stress, $\chi^2(1)=9.78, p=.002$. These analyses indicate that the interaction terms add significantly to our prediction of changes in alcohol use. Ethnicity was tested in each of the models. In models where ethnicity was not significant, it was dropped for parsimony, as the results were similar across the two models.

TABLE 2 presents the results of the HLM analyses for intergenerational individuation. Intergenerational individuation interacts significantly with stress to predict increases in adolescent alcohol use. Low intergenerational individuation and higher levels of stress predict increases in adolescent alcohol use, while high intergenerational individuation

Table 1

MEANS AND STANDARD DEVIATIONS FOR ALCOHOL USE, SEPARATION, INTERGENERATIONAL INDIVIDUATION, FAMILY CONFLICT AND STRESS

VARIABLE	NON-HISPANIC WHITES		AFRICAN AMERICANS		MEXICAN AMERICANS	
	M	(SD)	M	(SD)	M	(SD)
Time 1 Alcohol Use	5.12	(9.88)	5.03	(9.72)	4.93	(9.74)
Time 2 Alcohol Use	9.18	(13.83)	6.27	(10.84)	8.72	(12.83)
Time 3 Alcohol Use	12.35	(15.43)	7.64	(11.55)	11.69	(14.97)
Time 1 Separation	2.98	(0.81)	2.83	(0.83)	2.76	(0.83)
Time 2 Separation	3.26	(0.76)	3.04	(0.81)	3.05	(0.80)
Time 3 Separation	3.35	(0.70)	3.17	(0.74)	3.15	(0.76)
Time 1 Intergenerational Individuation	3.14	(0.89)	2.99	(0.88)	2.86	(0.79)
Time 2 Intergenerational Individuation	3.16	(0.83)	3.09	(0.87)	2.98	(0.77)
Time 3 Intergenerational Individuation	3.23	(0.83)	3.17	(0.86)	3.07	(0.79)
Time 1 Family Conflict	2.56	(1.04)	2.50	(1.03)	2.51	(1.01)
Time 2 Family Conflict	2.72	(1.06)	2.55	(1.03)	2.63	(1.03)
Time 3 Family Conflict	2.75	(1.02)	2.57	(1.02)	2.63	(1.00)
Time 1 Parental Monitoring	3.78	(0.89)	3.72	(0.87)	3.55	(0.94)
Time 2 Parental Monitoring	3.56	(0.96)	3.60	(0.91)	3.41	(0.97)
Time 3 Parental Monitoring	3.52	(0.94)	3.53	(0.91)	3.35	(0.98)
Time 1 Stress	2.03	(0.65)	2.12	(0.63)	2.12	(0.63)
Time 2 Stress	2.03	(0.61)	2.10	(0.63)	2.11	(0.62)
Time 3 Stress	2.03	(0.60)	2.12	(0.63)	2.11	(0.59)

Table 2

PARAMETER ESTIMATES OF EFFECTS FOR INTERGENERATIONAL INDIVIDUATION, FAMILY CONFLICT, STRESS, AND PARENTAL MONITORING, PREDICTING ALCOHOL USAGE

EFFECT	PARAMETER	(SE)	T-VALUE	p
Intercepts of the Level 1 Model				
	5.378	0.135	39.713	0.001
Time slope	2.869	0.100	28.706	0.001
Intergenerational Individuation slope	1.148	0.959	1.197	0.232
Parental Monitoring slope	-1.350	0.534	-2.530	0.012
Family Conflict slope	0.819	0.446	1.836	0.066
Stress slope	3.134	0.725	4.324	0.001
Mother's Education slope	0.240	0.136	1.769	0.076
Stress by Intergenerational Individuation slope	-0.609	0.228	-2.672	0.008
Family Conflict by Intergenerational Individuation slope	0.112	0.146	0.763	0.445
Parental Monitoring by Intergenerational Individuation slope	-0.138	0.170	-0.813	0.416

Note. Parameter estimates in the tables are from models using centered data, while parameter estimates used to create the figures are based on uncentered data to more accurately represent the relationships.

ation is predictive of lower increases in alcohol use at all levels of stress (see FIGURE 1). The figures plot the expected values under various conditions of intergenerational individuation and stress, using the parameter estimates from the HLM models. For these plots, the effects of the variables not plotted are held constant at their mean values. At low levels of stress, alcohol use increases some as intergenerational individuation increases, while at high levels of stress, alcohol usage decreases as intergenerational individuation increases. The differences in predicted usage are much larger when intergenerational individuation is at the low end of the scale than when it is at the high end. There

were no significant interactions between intergenerational individuation and family conflict or parental monitoring. There were significant main effects of family conflict and parental monitoring. Increases in parental monitoring were associated with decreases in adolescent alcohol use.

TABLE 3 presents the results of the HLM analyses for separation, family conflict, and parental monitoring. A separate model with separation, stress, and ethnicity is presented in TABLE 4. Separation interacts significantly with family conflict and parental monitoring to predict changes in adolescent alcohol use. When adolescents report high separation, more family conflict is predictive of increases in adolescent alcohol use, whereas low separation is associated with lower levels of alcohol use at all levels of family conflict (see FIGURE 2). With high levels of separation, increased parental monitoring predicts less alcohol use see (FIGURE 3). When parental monitoring is low, increases in separation predict increases in alcohol usage; however, at high levels of parental monitoring, predicted usage decreases as separation increases. Under conditions of low separation, parental monitoring at all levels is associated with low levels of alcohol use.

There are ethnic group differences for the model with separation and stress. Overall, African-Amer-

Figure 1

ALCOHOL USAGE AS A FUNCTION OF INTERGENERATIONAL INDIVIDUATION AND STRESS

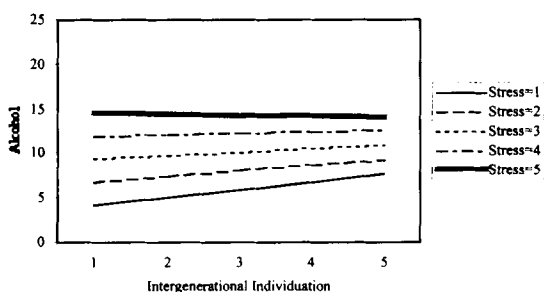


Table 3

PARAMETER ESTIMATES OF EFFECTS FOR SEPARATION, FAMILY CONFLICT, AND PARENTAL MONITORING PREDICTING ALCOHOL USAGE

EFFECT	PARAMETER	(SE)	T-VALUE	p
Intercepts of the Level 1 Model				
	5.579	0.144	38.841	0.001
Time slope	2.675	0.107	25.040	0.001
Separation slopes	1.513	0.834	1.814	0.069
Parental Monitoring slope	-0.103	0.546	-0.188	0.851
Family Conflict slope	-0.333	0.442	-0.753	0.451
Mother's Education slope	0.244	0.135	1.806	0.070
Family Conflict by Separation slope	0.488	0.148	3.305	0.001
Parental Monitoring by Separation slope	-0.451	0.166	-2.711	0.007

Note. Parameter estimates in the tables are from models using centered data, while parameter estimates used to create the figures are based on uncentered data to more accurately represent the relationships.

ican adolescents increased their drinking less than did white or Mexican-American adolescents. The parameter estimates indicate that the interaction was similar for white and Mexican-American adolescents, while African-American adolescents were significantly different than those groups. For white and Mexican-American adolescents, under conditions of high separation, more stress is predictive of greater increases in adolescent alcohol

use, while under conditions of low separation, stress at all levels is associated with lower levels of alcohol use (see FIGURES 4 AND 5). For African-American adolescents, at low levels of separation, the effects of stress are greater than at high levels of separation for predicting alcohol usage (see FIGURE 6). Separation has greater effects for white and Mexican-American adolescents than for African-American adolescents.

Table 4

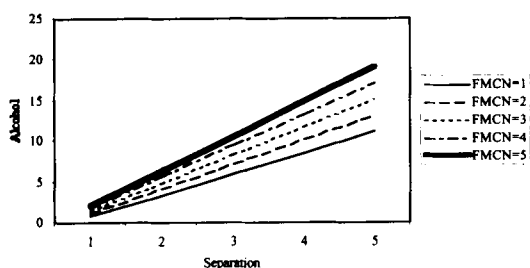
PARAMETER ESTIMATES OF EFFECTS FOR SEPARATION, STRESS, AND ETHNICITY PREDICTING ALCOHOL USAGE.

EFFECTS	PARAMETER	(SE)	T-VALUE	p
Intercepts of the Level 1 Model				
Non-Hispanic White	5.584	0.230	24.252	0.001
African-American	-0.416	0.362	-1.151	0.250
Mexican-American	-0.012	0.334	-0.037	0.971
Time slopes				
Non-Hispanic White	3.376	0.176	19.135	0.001
African-American	-2.126	0.259	-8.200	0.001
Mexican-American	-0.326	0.254	-1.284	0.200
Separation slopes				
Non-Hispanic White	-0.746	0.982	-0.759	0.448
African-American	2.816	1.326	2.123	0.033
Mexican-American	0.636	1.351	0.471	0.637
Stress slopes				
Non-Hispanic White	-2.722	1.414	-1.925	0.054
African-American	5.039	1.873	2.690	0.008
Mexican-American	0.905	1.859	0.487	0.626
Mother's Education slopes				
Non-Hispanic White	0.112	0.255	0.439	0.660
African-American	0.183	0.337	0.544	0.586
Mexican-American	0.208	0.329	0.633	0.527
Stress by Separation slopes				
Non-Hispanic White	1.411	0.480	2.941	0.004
African-American	-1.839	0.621	-2.963	0.004
Mexican-American	-0.140	0.649	-0.216	0.829

Note. Parameter estimates in the tables are from models using centered data, while parameter estimates used to create the figures are based on uncentered data to more accurately represent the relationships.

Figure 2

ALCOHOL USAGE AS A FUNCTION OF SEPARATION AND FAMILY CONFLICT



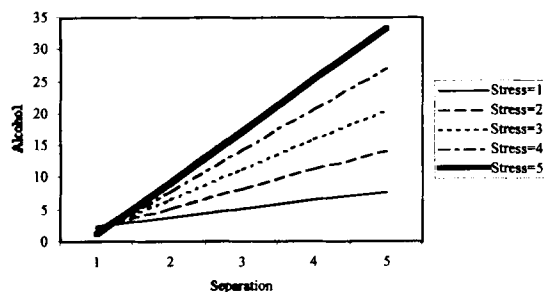
DISCUSSION

Overall, stress, family conflict, and parental monitoring interact with separation; and stress interacts with intergenerational individuation to predict increases in adolescent alcohol use over time. These findings support the important role of the individuation process for moderating the relationships among stress, family conflict, and alcohol use (Baer & Bray, 1999; Bray et al., 2000, 2001). Further, separation, but not intergenerational individuation, moderates the effects of parental monitoring on alcohol use. These relationships are similar for both boys and girls. The interaction of stress and separation varied for African-American adolescents as compared to their white and Mexican-American counterparts.

By examining rates of change with HLM, rather than just mean levels of alcohol use, we are better able to understand the combination of factors and conditions that are related to increases or decreases in youths' drinking. This is important because current prevention efforts need to focus on both preventing initiation of drinking and delaying or reducing the progression of alcohol use over time

Figure 4

ALCOHOL USAGE AS A FUNCTION OF SEPARATION AND STRESS FOR WHITE ADOLESCENTS



that may lead to substance abuse and alcoholism (Nelson et al., 1998). Delay of alcohol use is not sufficient in the long term; rather, it is equally necessary to decrease the rate of youth drinking to zero or exploratory levels. These findings indicate that certain combinations of individuation, stress, family conflict, and parental monitoring are more likely to lead to increased alcohol use that may help explain the current precipitous rise in youth drinking.

The interaction of intergenerational individuation and stress add significantly to our understanding of the conditions in which adolescents are likely to increase their drinking and provide empirical support for the theory underlying this view (Bowen, 1978; Williamson & Bray, 1988). Adolescents who are most likely to increase their drinking over time are those who have less individuated relationships with family and friends (through more separation, detachment, and emotional fusion) and also experience higher levels of stress, more family conflict, and less parental monitoring. At the other end of the spectrum, those adolescents who

Figure 3

ALCOHOL USAGE AS A FUNCTION OF SEPARATION AND PARENTAL MONITORING (PMON)

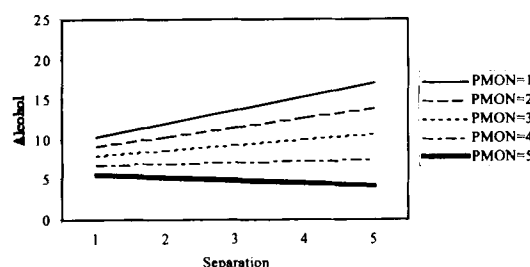


Figure 5

ALCOHOL USAGE AS A FUNCTION OF SEPARATION AND STRESS FOR MEXICAN-AMERICAN ADOLESCENTS

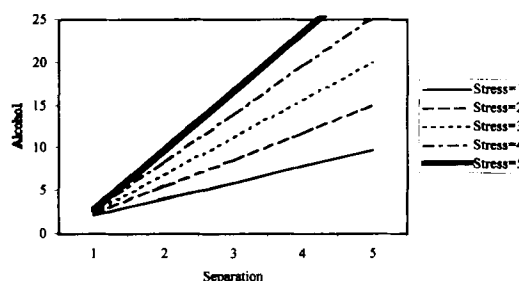
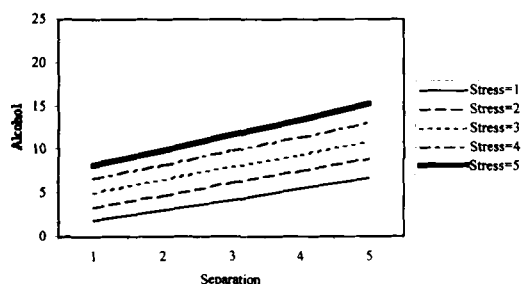


Figure 6

ALCOHOL USAGE AS A FUNCTION OF SEPARATION AND STRESS FOR AFRICAN-AMERICAN ADOLESCENTS



are more likely to drink less over time have more individuated relationships (either through more positive differentiation, autonomy development, or continued relations with parents), while levels of stress, family conflict, or even parental monitoring are less influential. Thus, intergenerational individuation appears to provide substantial protection from the negative impact of stress and family conflict on alcohol use. Parental monitoring is particularly important when adolescents have more detached and conflictual relationships with parents and under all conditions of more individuated family relationships. Further, these findings indicate the importance of examining the multiple aspects of the individuation process and their effects on adolescent drinking (Baer & Bray, 1999; Ryan & Lynch, 1989; Silverberg & Gondoli, 1996; Turner et al., 1991).

There are multiple theories that explain the influence of individuation, family conflict, and stress on adolescent drinking (Harvey & Bray, 1991). First, family factors, such as conflict or parenting, and the individuation process may be a source of stress or buffer for other sources of stress (Cohen & Wills, 1985; Neff, 1993; Wills & Cleary, 1996). This study supports this view but does not clearly distinguish between family processes as stressors or as buffers of stress. Second, the level of individuation within family relationships is the interpersonal context for the development and maintenance of substance use patterns (Harvey & Bray, 1991; Williamson & Bray, 1988). These patterns may include reduced risk-taking behavior, i.e., realism regarding alcohol use, increased willingness to take responsibility for drinking, and reduced emotional reactivity to stressful life events, including family events which makes the adolescent less

vulnerable to stress. This theory is supported by the findings that show the significant interaction among family conflict, stress, and individuation. Third, the quality of family relationships an individual experiences may be viewed as predisposing the individual to the repetition of maladaptive behavior patterns exhibited by earlier generations, such as alcohol abuse or other dysfunctional patterns (Bowen, 1978; Kerr, 1981). This view was not directly examined in the present study, but would be supported by research showing that, for individuals from families with a history of alcohol abuse, those experiencing more individuation in their relationships would be less prone to reproduce similar patterns of substance abuse (Protinsky & Ecker, 1990). Further research that illuminates these pathways to adolescent alcohol use or abuse is needed to develop prevention programs and therapeutic interventions.

These findings support the importance of parental monitoring as a protective factor against increases in adolescent drinking. Monitoring involves parents being aware of the various areas of an adolescent's life (Dishion & McMahon, 1998; Hetherington & Clingempeel, 1992). It is believed that by monitoring adolescents' behavior, parents are able to prevent involvement in deviant activities and association with deviant peers that may lead to behavioral problems such as alcohol abuse. In addition, monitoring involves appropriate influence in adolescents' lives, which is less likely to lead to oppositional acting-out behavior. Parental monitoring was most effective for reducing the negative association between adolescent separation and increased alcohol use and was important for all levels of intergenerational individuation. It appears that adolescents' belief that their parents are maintaining an awareness of their behavior and activities mitigates some of the negative impact of detachment and separation from the family that can lead to increased alcohol use. These two factors may provide important keys to reducing youth drinking and alcohol abuse.

The patterns of relationships were remarkably similar for white, Mexican-American and African-American adolescents. The exception was the effects of the interaction between separation and stress on alcohol use. An examination of the characteristics of the various ethnic groups suggests explanations for these differences. A higher percentage of African-American adolescents live in single-parent, maritally separated, or three-genera-

tional families (*National Center for Health Statistics, 1997; Thomas, Farrell, & Barnes, 1996; Wilson, 1992*). Adolescents in these families are more likely to have adult responsibilities and roles while parents are working outside the home, but parents expect adolescents to continue to respect parental authority in their absence (*Smetana, Abernethy, & Harris, 2000; Spencer & Dupree, 1996*). Therefore, separation within African-American families may have less influence on increasing alcohol use, particularly in the middle-class families of this study. In contrast, increases in separation and detachment in the face of high levels of stress place Mexican-American and white youth at greater risk for increased alcohol usage. Use of alcohol may be a form of rebellion and distancing from family ties, and may drive these youth to develop friends who use more alcohol. However, Mexican-American and white youth who increase their level of intergenerational individuation within the family are less likely to increase their drinking even in the face of high stress.

This research is useful for developing prevention and intervention programs for adolescents. The findings suggest that focusing on helping adolescents through the individuation process and, especially, decreasing the sense of separation and detachment from family will help them deal with the stresses and conflict of the adolescent transition. Enhancing individuation involves multiple aspects that include being aware of functional and dysfunctional family patterns, developing a strong sense of self, taking responsibility for one's actions, being less influenced by peer pressure, and developing appropriate autonomy. It is believed that enhancing individuation would also decrease the effects of friends and peers on alcohol use (*Baer & Bray, 1999; Bray et al., 2000, 2001*).

Therapy interventions based on this type of approach have been helpful for the treatment of adolescent substance abuse problems (*Szapocznik, Foote, Perez-Vidal, Hervis, & Kurtines, 1986*). Further, helping parents increase appropriate parental monitoring, improving parent-adolescent relationships, and decreasing family conflict in the context of increasing individuation appear to be important factors that can assuage adolescents from using alcohol (*Baer & Bray, 1999*). The use of family-based interventions as an approach to treating adolescent substance use and abuse is supported by this research. These findings suggest that more emphasis be placed on enhanced individual

growth of autonomy and differentiation from problematic family-of-origin patterns. Interventions from this perspective might include conflict resolution skills in the context of facilitating positive family and peer relationships (*Baer et al., 1987; Duncan, Duncan, & Hops, 1994*). Such interventions may enhance the programs that focus on peer influence and social skills (*Botvin, Botvin, & Ruchlin, 1998*).

There are limitations of this study that need to be considered when interpreting the findings. The data were limited to self-reports from the adolescents for all information collected, and some of the relationships may be enhanced due to contamination and method variance. The careful assessment and development of the measures using IRT methodology may serve to reduce some of these problems. Further, the data are the adolescents' personal perceptions of their development and social contexts, and are not necessarily reflective of the family as a whole or of actual family processes (*Bray, 1995*). More research is required to bear out the various perspectives and observations of families and further substantiate the impact of these factors on adolescent alcohol use (*Duncan, Duncan, Tildesley, & Hops, 1995; Duncan et al., 1996; Zucker, Boyd, & Howard, 1994*).

This study emphasizes the need to use longitudinal designs to investigate developmental and family processes and changes in substance use (*Duncan et al., 1996; Farrell, 1994*). This work highlights the significance of examining interactions among factors associated with adolescent alcohol use to better identify the combination of influences that may lead adolescents down the pathway to alcohol abuse. It is important that future research continue to examine the adolescent transition, evaluate the multiple perspectives of different family members and peers, and determine how these processes may change during later adolescence and young adulthood in ways that lead to problem drinking and alcoholism.

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