

Identity Consolidation and Health Risk Behaviors in College Students

Seth J. Schwartz, PhD ; Larry F. Forthun, PhD; Russell D. Ravert, PhD;
Byron L. Zamboanga, PhD; Adriana J. Umaña-Taylor, PhD; Beryl J. Filton, MA;
Su Yeong Kim, PhD; Liliana Rodriguez, PhD; Robert S. Weisskirch, PhD, MSW;
Michael Vernon, PhD; Yuliya Shneyderman, MS; Michelle K. Williams, PhD;
V. Bede Agocha, PhD; Monika Hudson, DM

Objectives: To investigate the protective role of personal identity consolidation against health risk behaviors in college-attending emerging adults. **Methods:** A multisite sample of 1546 college students completed measures of personal identity consolidation and recent risk behavior engagement. **Results:** Multivariate Poisson regression indicated that personal identity consolidation was negatively related to binge drinking, illicit drug use, sexual risk behaviors, and risky driving. These find-

ings were consistent across gender, ethnicity, and place of residence. **Conclusions:** A consolidated sense of personal identity may protect college-attending emerging adults from health-compromising behaviors. Health professionals could incorporate an identity development component into college health programming.

Key words: identity, alcohol use, illicit drug use, unsafe sex, impaired driving, college students

Am J Health Behav. 2010;34(2):214-224

Health risk behaviors such as excessive drinking, illicit drug use, unsafe sexual activity, and im-

paired driving represent considerable risks both to the individual and to society. Not only are these behaviors associated

Seth J. Schwartz, Associate Professor, Department of Epidemiology and Public Health, Leonard M. Miller School of Medicine, University of Miami, Miami, FL. Larry F. Forthun, Assistant Professor, University of Florida, Department of Family, Youth, and Community Sciences, Gainesville, FL. Russell D. Ravert, Assistant Professor, Department of Human Development and Family Studies, University of Missouri-Columbia, Columbia, MO. Byron L. Zamboanga, Assistant Professor, Department of Psychology, Smith College, Northampton, MA. Adriana J. Umaña-Taylor, Associate Professor, School of Social and Family Dynamics, Arizona State University, Tempe, AZ. Beryl J. Filton, Postdoctoral Fellow, Alcohol Research Group, St. John's University, Queens, NY. Su Yeong Kim, Assistant Professor, Department of Human Development and Family Sciences, University of Texas at Austin, Austin, TX. Liliana Rodriguez, Director of Diversity Recruitment, Williams College, Williamstown, MA. Robert S. Weisskirch, Associate Professor, Liberal Studies Department, California State University, Seaside, CA. Michael Vernon, PhD, Postdoctoral Fellow, Alcohol Research Group, Public Health Institute, Emeryville, CA. Yuliya Shneyderman, Doctoral Student, Department of Epidemiology and Public Health, Leonard M. Miller School of Medicine, University of Miami, Miami, FL. Michelle K. Williams, Associate Professor, Department of Psychology, University of Connecticut, Storrs, CT. V. Bede Agocha, Associate Professor, Department of Psychology, University of Connecticut, Storrs, CT. Monika Hudson, Assistant Professor, School of Business and Management, University of San Francisco, Millbrae, CA.

Address correspondence to Dr Schwartz, Department of Epidemiology and Public Health, Leonard M. Miller School of Medicine, University of Miami, 1425 NW 10th Avenue, Miami, FL 33136. E-mail: SSchwartz@med.miami.edu

with some of the leading causes of death in the United States¹ (eg, traffic crashes, drug overdoses), but they also pose costs to society in terms of property damage, violence, imprisonment, diminished lifespan, and treatment expenses.²

Although these health risk behaviors are often first initiated in adolescence,³ they may be even more prevalent and dangerous during emerging adulthood – the late teens and early twenties.⁴ Many emerging adults live independently from parents, allowing for increased freedom to spend their time and money as they wish. Even for those emerging adults who remain at home, parental supervision and authority are often substantially reduced.⁵ Accordingly, health policy scholars⁶ have recommended that studies of risk taking focus on emerging adulthood as well as on adolescence. College students tend to be among the highest-risk subgroups of emerging adults in terms of risk behaviors such as binge drinking,⁷ impaired driving,⁸ and misuse of prescription drugs.⁹ There is evidence that core developmental assets are protective against these and other emerging-adult health-compromising behaviors.⁴ Accordingly, the present study examined one theoretically salient developmental asset – personal identity consolidation – in protecting against health-compromising behaviors in college-attending emerging adults.

Personal Identity as a Protective Mechanism Against Health Risk Behavior

Developing a sense of personal identity has been posited as the primary psychosocial task of adolescence and emerging adulthood.^{10,11} Identity development involves forming an autonomous, agentic self;¹² establishing an internally consistent set of goals, self-perceptions, and behaviors;¹³ making and identifying with a set of life commitments;¹⁴ and perceiving oneself as an adult and as supported by a validating adult community.¹⁵ Erikson¹⁴ wrote that young people without these qualities may be the most likely to engage in high-risk behavior (eg, drug/alcohol abuse), either as an attempt to find themselves or to alleviate the anxiety associated with identity confusion. College students are more likely than working emerging adults to engage in identity exploration, but less likely to

have consolidated a sense of identity.¹⁵ Although the college atmosphere may encourage exploration of alternative possibilities, especially for younger students,¹⁶ this exploration is often associated with confusion and distress because it involves loosening or discarding existing commitments.¹⁷ Beginning to establish identity commitments and to settle into an adult lifestyle may help to relieve some of these symptoms and protect against risk behaviors.^{18,19} In some cases, prevention and intervention efforts may be needed to help college-attending emerging adults navigate this process as smoothly as possible.

More clarity is needed regarding the protective functions of personal identity vis-à-vis emerging-adult health risk behaviors. Personal identity consolidation is a multidimensional construct that subsumes several components that represent the goal of identity work in emerging adulthood: making and identifying with commitments, integrating various aspects of one's identity into a coherent whole, developing consistency across time, and perceiving oneself as an adult and as a member of an adult community.^{11,20} Although identity consolidation is conceptualized as a whole that is greater than its parts, it is nonetheless important to know whether this whole appears to be protective against health risk behaviors, as well as which specific components of identity consolidation are associated with specific health risk behaviors. Such knowledge could prove useful in developing and implementing prevention and intervention efforts.

The Present Study

The present study used an ethnically and geographically diverse sample drawn from 9 colleges and universities around the United States, including both public and private institutions (Table 1). We included one minority-serving college and one minority-serving university in the list of sites so that participants from ethnic minority groups would be adequately represented in the sample. We examined personal identity consolidation as an inverse correlate of binge drinking, illicit drug use, sexual risk taking, and impaired driving. Because past research has found gender, ethnic, and socioeconomic differences in health risk behavior participation, and in the relationship

Table 1
Description of Study Sites^a

Public/Private	Ethnicity	Gender	College ^b		University ^b	
			Primarily Commuter	Primarily Residential	Primarily Commuter	Primarily Residential
Private	Nonwhite	Male	8	11	0 ^d	0 ^d
		Female	11	18	0 ^d	0 ^d
	White	Male	4	32	0 ^d	0 ^d
		Female	7	48	0 ^d	0 ^d
Public	Nonwhite	Male	10	0 ^c	98	28
		Female	43	0 ^c	326	133
	White	Male	12	0 ^c	13	154
		Female	75	0 ^c	48	421

Note.

- a Twenty-eight participants did not indicate which college or university they attended, 14 did not report their gender, and 15 did not report their ethnicity.
- b For this table, *colleges* are defined as 4-year undergraduate-only institutions whereas *universities* are defined as institutions that offer both undergraduate and postgraduate programs.
- c There were no public residential 4-year colleges in our list of sites.
- d There were no private universities in our list of sites.

between psychosocial competencies and health risk behaviors,²¹ we examined consistency of our results across gender, ethnicity, and socioeconomic status. Moreover, because students who continue to live at home with parents may have fewer opportunities to take risks than students who live away from home, we also examined consistency of results across place of residence. A finding that the same (or similar) mechanisms are protective across living situations would suggest that similar interventions could be used with students living at versus away from home. We hypothesized that identity consolidation would be negatively associated with health risk behaviors and that this inverse relationship would generalize across gender, ethnicity, and residential status.

METHOD

Participants and Procedures

The 9 participating sites were selected to provide a broad geographic representation of the United States. Some were colleges and universities where the majority of students reside on campus or in off-campus apartments, and others were commuter schools where the majority of students reside at home with family members. Three of the sites were flagship

state universities, 4 were smaller state colleges and universities, and 2 were private colleges. At all sites, the study was approved by the site’s institutional review board. Participants were directed to the study Web-site using printed and e-mailed announcements. All data were collected online during the fall 2007 semester. Of students who logged in to the study Web-site, 93% completed the survey.

The sample consisted of 1546 students (25% men, 75% women; 54% White, 9% Black, 24% Hispanic, 7% Asian, and 6% other). Because of the focus on risk taking in the college context, only traditional college-age participants (ages 18-22) were included in the present analyses. The mean participant age was 19.29 years (SD 1.31). Nearly half of participants (45%) were in their first year of college, and the remainder were in their second (22%), third (19%), fourth (12%), or fifth (2%) years. Thirty percent of the sample reported living at home, 39% reported living on campus, and 24% reported residing in off-campus houses or apartments.

In terms of socioeconomic status, of those participants who reported their family’s annual income (85% of the sample), 18% indicated incomes below \$30,000; 20% indicated incomes between

\$30,000 and \$50,000; 32% indicated incomes between \$50,000 and \$100,000; and 30% indicated incomes above \$100,000. Consistent with data reported by the US Census Bureau,²² only 13% of Whites reported annual family incomes below \$30,000, compared to 30% of Blacks, 23% of Hispanics, and 22% of Asians. Similarly, and also consistent with Census data, 42% of Whites reported annual family incomes above \$100,000, compared to 12% of Blacks, 12% of Hispanics, and 28% of Asians.

Measures

Personal identity consolidation. Identity consolidation was indexed using 7 measures,²⁰ (1) the commitment making (5 items, $\alpha=.92$) and identification with commitment (5 items, $\alpha=.93$) subscales from the Dimensions of Identity Development Scale,¹⁵ (2) the identity synthesis subscale (6 items, $\alpha=.80$) from the Erikson Psychosocial Stage Inventory,^{23,24} (3) the subjective synthesis (5 items, $\alpha=.81$) and behavioral synthesis (5 items, $\alpha=.62$) subscales from the identity issues inventory,²⁵ and (4) the adult identity resolution (3 items, $\alpha=.79$) and community identity resolution (4 items, $\alpha=.70$) subscales from the Identity Stage Resolution Index.²⁶ A 5-point Likert scale, ranging from 1 (Strongly Disagree) to 5 (Strongly Agree), was used for all of the identity consolidation measures. All alpha coefficients reported here are from the current sample.

Health risk behaviors. Using a 5-point scale, participants were asked how many times in the past 30 days they had engaged in a variety of risky behaviors: 0 (Never), 1 (Once/Twice), 2 (3-5 Times), 3 (6-10 Times), 4 (10+ Times). We inquired about binge drinking as well as several types of illicit drug use, unsafe sexual behavior, and impaired driving. For illicit drug use, we included items referencing marijuana, hard drugs (eg, methamphetamines, cocaine, crack), inhalants, injectable drugs, and misuse of prescription drugs (any use not specifically prescribed by a doctor). For unsafe sexual behavior, we included items referencing unprotected sex, oral sex, anal sex, casual sex (sex with a stranger), and sex while drunk or high. For impaired driving, we asked about driving (or riding with a driver who was) under the influence of alcohol or drugs. Binge drinking was converted into a dichotomous yes/no variable because

over 99% of the sample provided responses of 0 or 1. The original response scale was used for all other risk behaviors.

Analytic Strategy

Analyses proceeded in 3 steps. First, we dichotomized each of the health risk behavior variables and cross-tabulated them by gender and ethnicity to examine demographic differences in risk behavior participation. We created these dichotomized health risk behavior variables by recoding the response scale for each behavior so that 0 was coded as "No" (ie, no use in the 30 days prior to assessment) and 1 was coded as "Yes" (ie, any valid response other than zero, reflecting at least some use in the 30 days prior to assessment). Second, we used confirmatory factor analysis to create a latent identity consolidation variable and regressed each of the risk behavior indices on this latent variable using multivariate Poisson regression. Third, we examined whether these associations were consistent across gender, ethnicity, and residential status. For the second and third steps of analysis, robust maximum likelihood estimation was used to include cases with missing data and to control for nonnormality in the identity variables. Little's²⁷ test of the missing completely at random (MCAR) assumption was nonsignificant for the identity variables, $\chi^2(52)=44.84$, $P=.75$; and for the risk behavior responses, $\chi^2(209)=193.59$, $P=.77$, suggesting that maximum likelihood estimation was appropriate.

RESULTS

Gender and Ethnic Differences

As shown in Table 2, significant gender differences emerged for 4 of the 6 substance use behaviors, 2 of the 5 sexual risk behaviors, and impaired driving, but not for riding with an impaired driver. Men were more likely than women to engage in all of the behaviors where significant gender differences occurred. Significant ethnic differences emerged for all of the substance use behaviors, for all of the sexual risk behaviors except for anal sex, and for both indices of risky driving. Whites were most likely, and Asians least likely, to engage in these risky behaviors. Injecting drug use was excluded from analysis because only 10 participants reported engaging in this behavior.

Table 2
Health Risk Behaviors by Gender and Ethnicity^a

Behavior	Gender		χ^2 (1)	Ethnicity				χ^2 (3)
	Male (%)	Female (%)		White (%)	Black (%)	Hispanic (%)	Asian (%)	
Binge Drinking	32.4	17.5	34.97***	32.3	4.8	6.4	13.7	122.34***
Illicit Drug Use								
Marijuana use	45.6	39.2	4.47*	47.9	27.8	30.8	31.0	43.38***
Hard drug use	9.0	8.8	0.03	10.3	3.1	5.8	7.0	11.71**
Inhalant use	8.2	5.6	5.29*	7.7	2.4	3.8	6.0	10.04*
Injecting drug use	1.8	0.7	3.16	0.9	0.0	0.6	2.0	3.02
Prescription drug misuse	13.3	9.1	5.06*	13.8	1.6	4.3	8.0	35.85***
Unsafe Sexual Behavior								
Unprotected sex	44.5	49.3	2.42	50.3	50.0	46.2	36.0	8.07*
Oral sex	71.9	66.8	3.10	72.6	62.4	66.3	50.0	24.53***
Anal sex	20.2	14.6	6.21*	15.7	12.7	17.6	15.0	1.84
Casual sex	24.9	17.2	10.24**	20.7	23.6	13.6	15.7	10.52*
Sex while intoxicated	47.3	45.0	0.57	55.7	32.3	32.8	32.7	69.85***
Impaired Driving								
Driving while intoxicated	25.5	17.5	10.91**	21.9	19.2	16.3	11.8	8.94*
Riding with impaired driver	41.4	40.9	0.03	44.0	36.5	36.1	34.0	9.27*

Note.

a To control for Type I error inflation, post hoc comparisons were conducted at $\alpha = .01$.

* $P < .05$ ** $P < .01$ *** $P < .001$

Health Risk Behaviors by Personal Identity Consolidation

We created a latent variable for personal identity consolidation using indices of identity synthesis, adult identity resolution, community resolution, subjective synthesis, and commitment. Because commitment making and identification with commitment were strongly correlated ($r = .86$), we summed these 2 variables into a composite indicator. The confirmatory factor analysis (CFA) model provided an adequate fit to the data, $\chi^2/df(N=1512) = 11.09$; comparative fit index (CFI) = .98; non-normed fit index (NNFI) = .95; root mean square error of approximation (RMSEA) = .082; standardized root mean square residual (SRMR) = .026. Although the chi-square to degrees of freedom (χ^2/df) ratio was large because of sample size, the other fit indices suggested that model fit was adequate. Factor pattern coefficients ranged from .53 to .90, with a mean of .71.

We then estimated a model in which personal identity consolidation predicted engagement in health risk behaviors. The responses to the health risk behav-

ior items followed a Poisson distribution, where the most frequently occurring response is zero. As a result, there is no way to transform these data so that they approximate a normal distribution. We therefore analyzed these data using multivariate Poisson regression,²⁸ where taking the inverse log of a given regression coefficient yields an incidence rate ratio (IRR). The IRR represents the multiplicative extent to which the expected count would be estimated to increase or decrease with each one-unit increase in the predictor variable. We standardized the identity consolidation latent variable by constraining its variance to 1, so that that the “units” in question would be standard deviations.

Another important issue in analyzing count variables is the extent to which zeroes dominate the frequency distribution. In cases where 80% or 90% of respondents indicate no engagement in the behavior in question, zero-inflated Poisson (ZIP) models²⁸ should be used, in which the zeroes are modeled separately from the nonzero count data. The count variable is split into 2 parts: a dichotomous

indicator reflecting whether or not the person engaged in the behavior in question and a count variable reflecting how many times the person engaged in the behavior. In cases where the person did not engage in the behavior, the count variable is specified as missing.

Count variables with less than 75% zero responses were modeled as simple count outcomes, whereas those with 75% or more zero responses were analyzed using ZIP models. Risk behaviors endorsed by less than 25% of participants included hard drug use, inhalant use, prescription drug misuse, casual sex, anal sex, and driving under the influence (Table 2). Regression coefficients are expressed as odds ratios (OR) for dichotomous variables and as incidence rate ratios (IRR) for count variables.

Effects of site were controlled by creating dummy-coded variables for all but one of the sites and modeling these dummy variables as additional predictors of the risk behavior outcomes. This is the preferred solution when there are not enough sites to estimate a multilevel model (Bengt Muthén, Mplus workshop, August 2007). The reference group for these dummy variables was the site that provided the largest number of participants.

Results of the multivariate Poisson regression analysis are presented in Table 3. As hypothesized, identity consolidation was significantly and negatively associated with binge drinking, marijuana use, hard drug use, inhalant use, and prescription drug misuse. Identity consolidation was negatively related to 3 of the sexual risk behaviors: unprotected sex, casual sex, and sex while intoxicated. Identity consolidation was also negatively associated with impaired driving and riding with an impaired driver. Model results did not change appreciably when age was statistically controlled.

Invariance Across Gender, Ethnicity, and Residential Status

We then examined the extent to which the relationships between identity consolidation and risk behaviors were consistent across gender, ethnicity, socioeconomic status, and residential status (at home versus elsewhere). Mixture models, using gender, ethnicity, socioeconomic status, or living arrangements as “known class” variables, can be used to test for invariance in models with di-

chotomous or count variables.²⁹ As in standard multigroup invariance testing, a model with all paths from identity consolidation to health risk behaviors free to vary across gender, ethnicity, socioeconomic status, or residential status is compared against a model with these paths constrained equal. Although standard goodness-of-fit indices are not available in models with count outcomes, the invariance test can be conducted by computing the difference between the -2 log likelihood values for the constrained versus unconstrained models. This difference is distributed and interpreted as a $\Delta\chi^2$ value. If the $\Delta\chi^2$ value is not significant, the model can be assumed to fit equivalently across groups. Results indicated that the relationship of identity consolidation to health risk behaviors was consistent across gender, $\Delta\chi^2(17)=13.95$, $P=.67$; ethnicity, $\Delta\chi^2(51)=29.84$, $P=.99$; socioeconomic status, $\Delta\chi^2(51)=18.98$, $P=.99$; and residential status, $\Delta\chi^2(34)=23.85$, $P=.90$.

Post Hoc Decomposition Models

As stated earlier, in addition to ascertaining whether identity consolidation – as a higher-order construct – may be protective against health risk behaviors, for intervention purposes it is important to ascertain precisely *which* components of identity consolidation may be significantly and negatively related to engagement in health risk behaviors. Those components of identity consolidation that emerge as significant vis-à-vis health risk behaviors would then represent potential targets for risk reduction interventions targeted toward college students.

Post hoc decomposition models were then conducted, using the individual indicators for identity consolidation as predictors of health risk behaviors (Table 3). All of the identity consolidation indicators were significantly and negatively related to marijuana use and to riding with an impaired driver. Identity synthesis appeared to be the most consistent inverse correlate of illicit drug use and impaired driving. Perceiving oneself as an adult was negatively related to binge drinking, marijuana use, prescription drug misuse, casual sex, and riding with an impaired driver. Subjective self-consistency was negatively associated with prescription drug misuse, unprotected sex, casual sex, and sex under the influence of

Table 3
Health Risk Behaviors by Personal Identity Consolidation and Its Indicators (Point Estimates and Confidence Intervals)

	Identity Consolidation (Composite)	Identity Synthesis	Adult Identity Resolution	Community Identity	Subjective Consistency	Behavioral Consistency	Commitment ^a
Binge Drinking	.97* (.95-.99)	1.00 (.98-1.02)	.97*** (.95-.98)	.99 (.98-1.01)	.99 (.97-1.01)	.99 (.97-1.01)	.99 (.97-1.00)
Illicit Drug Use							
Marijuana use	.87*** (.81-.93)	.94** (.91-.98)	.92*** (.89-.96)	.96* (.92-.99)	.94*** (.90-.97)	.93*** (.90-.97)	.94** (.91-.98)
Hard drug use ^b							
Yes/No	.65** (.47-.90)	.69*** (.57-.83)	.82 (.66-1.01)	1.04 (.86-1.27)	.84 (.69-1.03)	.73*** (.61-.89)	.80* (.66-.96)
Count	.98 (.90-1.06)	1.04 (.96-1.12)	.96 (.87-1.06)	1.00 (.91-1.10)	.99 (.91-1.09)	.98 (.89-1.08)	1.05 (.96-1.15)
Inhalant use ^b							
Yes/No	.67* (.47-.95)	.75** (.61-.92)	.83 (.64-1.03)	.91 (.73-1.12)	.85 (.68-1.06).97	.77* (.62-.96)	.77* (.63-.95)
Count	.97 (.87-1.07)	1.01 (.91-1.12)	.94 (.85-1.04)	.98 (.86-1.11)	.97 (.86-1.10)	.94 (.84-1.04)	1.10 (.99-1.23)
Prescription drug misuse ^b							
Yes/No	.61*** (.45-.82)	.71*** (.60-.84)	.79* (.65-.96)	.87 (.73-1.04)	.79* (.66-.95)	.75** (.63-.90)	.76** (.64-.90)
Count	1.02 (.92-1.12)	1.00 (.92-1.09)	1.04 (.94-1.14)	1.09 (.99-1.21)	1.03 (.94-1.14)	1.02 (.93-1.12)	1.07 (.98-1.16)
Unsafe Sexual Behavior							
Unprotected sex	.94* (.90-.99)	1.02 (.98-1.05)	1.00 (.97-1.04)	.99 (.95-1.02)	.96* (.93-.99)	.97 (.94-1.01)	1.02 (.98-1.06)
Oral sex	.98 (.94-1.02)	1.03 (1.00-1.07)	1.01 (.98-1.04)	.99 (.96-1.02)	1.00 (.97-1.02)	1.00 (.97-1.03)	1.03 (1.00-1.06)
Anal sex ^b							
Yes/No	1.00 (.97-1.02)	.99 (.86-1.14)	1.02 (.88-1.18)	1.17* (1.02-1.35)	.99 (.86-1.14)	.88 (.77-1.01)	1.13 (.97-1.31)
Count	.98 (.90-1.05)	.99 (.91-1.09)	1.07 (.99-1.16)	1.06 (.97-1.16)	1.01 (.92-1.11)	1.07 (.98-1.17)	1.02 (.93-1.12)
Casual sex ^b							
Yes/No	.96* (.93-.99)	.92 (.80-1.07)	.94 (.82-1.09)	1.03 (.90-1.17)	.87* (.76-.99)	.79*** (.69-.91)	.98 (.86-1.12)
Count	1.02 (.96-1.08)	.97 (.91-1.03)	1.07* (1.01-1.14)	1.09* (1.01-1.17)	1.05 (.98-1.12)	.96 (.90-1.02)	.99 (.93-1.06)
Sex while drunk/high	.92* (.87-.98)	1.02 (.98-1.06)	.98 (.94-1.01)	1.00 (.96-1.03)	.96* (.93-.99)	.96* (.93-.99)	1.01 (.97-1.04)
Impaired Driving							
Driving while drunk/high ^b							
Yes/No	.81* (.66-.98)	.87* (.76-.99)	1.04 (.90-1.20)	1.03 (.90-1.18)	1.00 (.87-1.15)	.89 (.78-1.02)	.89 (.77-1.02)
Count	.94 (.99-1.01)	.96 (.92-1.01)	.99 (.93-1.04)	.98 (.92-1.05)	.97 (.91-1.04)	.98 (.93-1.04)	.97 (.91-1.03)
Riding with impaired driver	.89*** (.85-.94)	.95** (.91-.98)	.91*** (.88-.95)	.94*** (.91-.98)	.93*** (.90-.96)	.93*** (.90-.96)	.94*** (.91-.97)

Note.

a Composite variable created using commitment making and identification with commitment.

b Zero-inflated Poisson (ZIP) models were used for these behaviors.

* P<.05 ** P<.01 *** P<.001

drugs or alcohol. Consistency of behavior across situations was negatively related to hard drug use, inhalant use, prescription drug misuse, casual sex, and sex while drunk or high. Having established identity commitments was negatively related to hard drug use, inhalant use, and prescription drug misuse. Identifying with one’s commitments was negatively related to hard drug use and prescription drug misuse. Unexpectedly, having found a validating adult community was *positively* associated with anal and casual sex.

DISCUSSION

The present study examined the role of personal identity consolidation, and its components, in potentially protecting college-attending emerging adults from health risk behaviors. Although the

sample was not randomly selected, the rates of risk behavior participation obtained were consistent with those reported in recent population-based studies.^{21,30} For example, consistent with recent epidemiological statistics on older adolescents,³⁰ gender differences emerged in 7 of the 13 health risk behaviors examined (binge drinking, marijuana use, inhalant use, prescription drug misuse, anal sex, casual sex, and intoxicated driving), with men more likely than women to engage in all of these behaviors. Furthermore, given our efforts to include both traditional and minority-serving institutions, the ethnic breakdown of the sample was consistent with the current ethnic distribution of the US population,³¹ and the differences by ethnicity – found for 11 of the 13 behaviors examined – suggest

that, among ethnic groups, Whites are most likely to engage in these behaviors. This is consistent with prior epidemiological research suggesting that, although in early adolescence Black and Hispanic youth are more likely than Whites to engage in sexual risk behavior, and Hispanics more likely than Whites to use drugs and alcohol, Whites may be more likely than members of other ethnic groups to engage in many health risk behaviors in emerging adulthood.³² Our sample was therefore largely consistent with epidemiological data, perhaps adding credence to our findings.

The Protective Role of Personal Identity Consolidation

Personal identity consolidation, a primary task of adolescence and emerging adulthood,^{10,11} was negatively related to binge drinking; marijuana use; hard drug use; inhalant use; prescription drug misuse; unprotected, casual, and intoxicated sex; and intoxicated driving and riding with an intoxicated driver. These relationships were consistent across gender, ethnicity, socioeconomic status, and living arrangements – suggesting that identity consolidation may be equally protective for men and women, across the 4 major US ethnic groups, across income brackets, and for students who reside at home as well as those who do not.

The protective nature of personal identity consolidation may be explained in several ways. First, college students, compared to emerging adults in the workforce, are more likely to engage in identity exploration, but less likely to have consolidated a sense of identity.¹⁵ As a result, although the college atmosphere is likely to encourage identity work,¹⁶ this exploration may prolong the process of identity consolidation and may induce confusion, at least temporarily.²³ In turn, this confusion, and concomitant lack of consolidation, can represent one factor that increases the likelihood of risk-taking behavior. On the other hand, risk-taking behavior often decreases with the assumption of adult roles (eg, marriage, parenthood, employment).³³ Given that personal identity consolidation represents a core developmental asset necessary for the successful transition to adulthood,¹¹ personal identity consolidation may be a sign that the emerging adult is settling into an adult lifestyle and is decreasing

engagement in health risk behaviors. In particular, the presence of *all* of the components of identity consolidation may suggest that the higher-order identity consolidation construct has been activated and may invoke additional protection against health risk behaviors.

Examining the component dimensions of identity consolidation separately suggested that different dimensions of identity consolidation may potentially protect emerging-adult college students against different types of health risk behaviors. Perceiving oneself as an adult was associated with decreased likelihood of binge drinking. Consistency across aspects of one's identity was associated with decreased likelihood of hard drug and inhalant use. Consistency of self across time and place appeared to be somewhat protective against casual, unprotected, and intoxicated sex. Synthesis among the various aspects of one's identity appeared to be protective against intoxicated driving. All of these components of identity consolidation appeared to be protective against marijuana use, prescription drug misuse (except for having found a validating community), and riding with an intoxicated driver.

These findings suggest that most or all of the components of identity consolidation appear to be required to maximally decrease the likelihood of most drug and alcohol risks, sexual risk behaviors, and impaired driving. Such a solid sense of identity, represented by identity consolidation and its various components, is likely associated with an orientation toward the future,³⁴ which can decrease the likelihood of engaging in hedonistic behaviors that bring short-term pleasure, but that may have severely negative health consequences.¹

Limitations and Future Directions

Although our findings are consistent with past research in this area,^{19,35} these findings should be interpreted in light of at least 4 important limitations. First, although we gathered data from a number of sites around the country, this was a sample of convenience. It is not known whether the findings might have been different with a population-based, gender-balanced sample of students. Second, although the present findings are suggestive of protective effects, the cross-sectional design used does not allow us to

draw definitive conclusions about causality or directionality.³⁶ The present results should be replicated longitudinally to increase confidence in the conclusions that can be drawn. It should also be noted that the present study examined only one potential protective resource – personal identity consolidation – and that many other correlates and predictors of health risk behaviors have been identified. Third, data on health risk behaviors were gathered exclusively through self-reports. As a result, we do not know whether participants may have underreported (or overreported) their engagement in risk behaviors. However, prior research suggests that young people tend to be more honest about sensitive or illegal behavior on computer-based, anonymous surveys than on paper-pencil or interview assessments.^{37,38} Fourth, although we found that men were more likely than women to report sexual risk behavior, we do not know whether this gender difference is due to (1) the presence of homosexual men in the sample, (2) multiple men reporting sexual encounters with the same women, (3) inaccuracies in reporting, or (4) some combination of these possibilities. It is important for future research to assess gender of sexual partners as well as to gather collateral reports of sexual encounters (eg, from sexual partners) if possible.

Despite these limitations, the present results suggest that the process of personal identity consolidation, which results from a period of exploration and represents the demarcation between emerging and full adulthood,^{18,39} may be an important developmental resource against binge drinking, illicit drug use, unsafe sexual behavior, and impaired driving among emerging-adult college students. Helping young people to explore identity alternatives in a systematic way, and to consolidate a sense of identity from among the alternatives that have been considered, could prove useful in prevention and intervention programming efforts. Although young people exploring their identities are likely to experience some temporary identity confusion, intervention programs may be most important and relevant for those individuals who are drifting and experiencing more aggregated and prolonged identity confusion. What is important, of course, is stimulating the *process* (meaningful and

systematic exploration) by which identity is developed – regardless of the *content* of the identity formed. There is a growing knowledge base regarding the types of intervention strategies that are most likely to promote systematic exploration (and hopefully consolidation), such as problem-solving and introspection exercises.^{40,41} Youth development programs may also be important in helping emerging adults explore and develop a sense of identity.⁴² Such programming should be implemented in addition to strategies that specifically target risk behaviors and should be delivered to students residing at home and off campus, as well as those residing in on-campus dormitories or apartments. It is hoped that recognizing the protective role of identity consolidation, and better understanding how it can be promoted, can stimulate the development of more effective programs to help prevent health risk behaviors and the potentially serious consequences that may follow.

Acknowledgments

We thank Melina Bersamin, Roxanne Donovan, Eric Hurley, and Nadja Schreiber for their help with data collection. ■

REFERENCES

1. Mokdad AH, Marks JS, Stroup DF, Gerberding JL. Correction: actual causes of death in the United States, 2000. *JAMA*. 2005;293:293-294.
2. Kolek EA. Recreational prescription drug use among college students. *NASPA Journal*. 2006;43:19-39.
3. Steinberg L. Risk taking in adolescence: what changes and why? *Ann NY Acad Sci*. 2004;1021:51-58.
4. Arnett JJ. The developmental context of substance use in emerging adulthood. *J Drug Issues*. 2005;35:235-254.
5. Aquilino WS. Family relationships and support systems in emerging adulthood. In: Arnett JJ, Tanner JL, eds. *Emerging Adults in America: Coming of Age in the 21st Century*. Washington, DC, American Psychological Association 2006:193-217.
6. Furstenberg FF. Editorial: growing up healthy: are adolescents the right target Group? *J Adolesc Health*. 2006;39:303-304.
7. Slutske WS. Alcohol use disorders among US college students and their non-college-attending peers. *Arch Gen Psychiatry*. 2005;62:321-327.
8. Chou SP, Grant BF, Dawson DA, et al. Twelve month prevalence and changes in driving after drinking: United States, 1991-1992 and 2001-2002. *Drug Alcohol Depend*. 2005;80:223-

- 230.
9. Whitten L. Studies identify factors surrounding rise in abuse of prescription drugs by college students. Available at: http://www.nida.nih.gov/NIDA_notes/NNvol20N4/Studies.html. Accessed December 3, 2008.
 10. Arnett JJ. Emerging adulthood: a theory of development from the late teens through the twenties. *Am Psychol.* 2000;55:469-480.
 11. Erikson EH. *Childhood and Society*. New York: Norton; 1950.
 12. Côté JE, Levine CG. *Identity Formation, Agency, and Culture: A Social Psychological Synthesis*. Mahwah, New Jersey: Lawrence Erlbaum Associates Publishers; 2002.
 13. Dunkel CS. The relation between self-continuity and measures of identity. *Identity.* 2005;5:21-34.
 14. Luyckx K, Goossens L, Soenens B, Beyers W. Unpacking commitment and exploration: preliminary validation of an integrative model of late adolescent identity formation. *J Adolesc.* 2006;29:361-378.
 15. Luyckx K, Schwartz SJ, Goossens L, Pollock S. Employment, sense of coherence, and identity formation: contextual and psychological processes on the pathway to sense of adulthood. *J Adolesc Res.* 2008;23:566-591.
 16. Montgomery MJ, Côté JE. College as a transition to adulthood. In: Adams GR, Berzonsky MD (Eds). *Blackwell Handbook of Adolescence*. Malden, MA: Blackwell, 2003;149-172.
 17. Schwartz SJ, Zamboanga BL, Weisskirch RS, Rodriguez L. The relationships of personal and ethnic identity exploration to indices of adaptive and maladaptive psychosocial functioning. *Int J Behav Dev.* 2009;33:131-144.
 18. Fischer JL, Forthun LF, Pidcock BW, Dowd DA. Parent relationships, emotion regulation, psychosocial maturity and college student alcohol use problems. *J Youth Adolesc.* 2007;36:912-926.
 19. Hernandez JT, DiClemente RJ. Self-control and ego identity development as predictors of unprotected sex in late adolescent males. *J Adolesc.* 1992;15:437-447.
 20. Schwartz SJ. The structure of identity consolidation: multiple correlated constructs or one superordinate construct? *Identity.* 2007;7:27-49.
 21. Johnston LD, O'Malley PM, Bachman JG, Schulenburg JE. *Monitoring the Future National Results on Adolescent Drug Use: Overview of Key Findings, 2007*. Bethesda, MD: National Institute on Drug Abuse; 2007.
 22. U.S. Census Bureau. *Statistical Abstract of the United States, 2000*. Washington, DC: U.S. Census Bureau, 2001.
 23. Rosenthal DA, Gurney RM, Moore SM. From trust to intimacy: a new inventory for examining Erikson's stages of psychosocial development. *J Youth Adolesc.* 1981;10:525-537.
 24. Schwartz SJ, Zamboanga BL, Wang W, Olthuis JV. Measuring identity from an Eriksonian perspective: two sides of the same coin? *J Pers Assess.* 2009;91:143-154.
 25. Côté JE, Roberts SE. *Identity Issues Inventory—Manual*. London, Canada: University of Western Ontario; 2006.
 26. Côté JE. An empirical test of the identity capital model. *J Adolesc.* 1997;20:577-597.
 27. Little RJA. A test of missing completely at random for multivariate data with missing values. *J Am Stat Assoc.* 1988;83:1198-1202.
 28. Atkins DC, Gallop RJ. Rethinking how family researchers model infrequent outcomes: a tutorial on count regression and zero-inflated models. *J Fam Psychol.* 2007;21:726-735.
 29. Muthén LK, Muthén BO. *Mplus User's Guide (5th edition)*. Los Angeles, CA: Muthén and Muthén; 2007.
 30. Chou SP, Grant BF, Dawson DA, et al. Twelve month prevalence and changes in driving after drinking: United States, 1991-1992 and 2001-2002. *Drug Alcohol Depend.* 2005;80:223-230.
 31. Bernstein R. Minority population tops 100 million. Available at: http://www.census.gov/dcmd/www/embargo/popest/national/pionat_stat.html. Accessed March 17, 2007.
 32. Siebert DC, Wilke DJ, Delva J, et al. Differences in African American and White college students' drinking behaviors: consequences, harm reduction strategies, and health information sources. *J Am Coll Health.* 2003;52:123-129.
 33. Bachman JG, O'Malley PM, Schulenberg JE, et al. *The Decline of Substance Use in Young Adulthood: Changes in Social Activities, Roles, and Beliefs*. Mahwah, NJ: Lawrence Erlbaum Associates, 2002.
 34. Luyckx K, Lens W, Smits I, Goossens L. Time perspective and identity formation: Short-term longitudinal dynamics in college students. *Int J Behav Dev.* (In press).
 35. Schwartz SJ, Mason CA, Pantin H, Szapocznik J. Effects of family functioning and identity confusion on substance use and sexual behavior in Hispanic immigrant early adolescents. *Identity.* 2008;8:107-124.
 36. Kraemer HC, Yesavage JA, Taylor JL, Kupfer D. How can we learn about developmental processes from cross-sectional studies, or can we? *Am J Psychiatry.* 2000;157:163-171.
 37. Newman JC, Des Jarlais DC, Turner CF, et al. The differential effects of face-to-face and computer interview modes. *Am J Public Health.* 2002;92:294-297.
 38. Turner CF, Ku L, Rogers SM, et al. Adolescent sexual behavior, drug use, and violence: increased reporting with computer survey technology. *Science.* 1998;280:867-873.
 39. Schwartz SJ, Côté JE, Arnett JJ. Identity and agency in emerging adulthood: two developmental routes in the individualization process. *Youth Soc.* 2005;37:201-229.
 40. Ferrer-Wreder L, Lorente CC, Kurtines W. Promoting identity development in marginalized youth. *J Adolesc Res.*

2002;17:168-187.

41.Schwartz SJ, Kurtines WM, Montgomery MJ. A comparison of two approaches for facilitating identity exploration processes in emerging adults: an exploratory study. *J Adolesc Res.* 2005;20:309-345.

42.Larson R, Walker K, Pearce N. A comparison of youth-driven and adult-driven youth programs: balancing inputs from youths and adults. *J Community Psychol.* 2005;33:57-74.