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## Do Incest, Depression, Parental Drinking, Serious Romantic Relationships, and Living with Parents Influence Patterns of Substance Use During Emerging Adulthood?

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### Abstract

This study examined how incest, depression, parental drinking, relationship status, and living with parents affect patterns of substance use among emerging adults, 18 to 25 years old. The study sample included (n = 11,546) individuals who participated in Waves I, II, and III of the National Longitudinal Study of Adolescent Health (Add Health). The study used separate latent class analysis for males and females to determine how patterns of substance use clustered together. The study identified the following three classes of substance use: heavy, moderate, and normative substance use patterns. Multinomial logistic regression indicated that, for females only, incest histories also nearly doubled the risk of heavy-use class membership. In addition, experiencing depression, being single, and not living with parents serve as risk factors for males and females in the heavy-use group. Conversely, being Black, Hispanic, or living with parents lowered the likelihood of being in the group with the most substance use behaviors (i.e., heavy use). Findings highlight the need for interventions that target depression and female survivors of incest among emerging adults.

### Keywords

depression; emerging adult; incest; latent class analysis; relationship status; substance use

### INTRODUCTION

According to the 2010 National Survey on Drug Use and Health, illicit drug use, tobacco use, alcohol consumption, and alcohol-related problems are most prevalent among emerging adults (18- to 25-year-olds) (SAMHSA 2011). Risk factors associated with a greater likelihood of substance use include sexual abuse, depression, and parental drinking; protective factors include living with parents or being involved in a serious romantic relationship, which buffer against substance use (Fergusson, Boden & Horwood 2008; Ompad et al. 2005; Shin, Hong & Hazen 2010). Despite these findings, researchers have yet

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to explore whether these risk and protective factors predict distinct patterns of substance use and related behaviors among emerging adults. This study examines how patterns of problematic substance use differ based on the risk factors of depression and incest (i.e., sexual abuse by a parent or caregiver), and the protective factors of either living at home with parents or being involved in a romantic relationship. Using the applied risk and protective framework, this study illuminates intervention points for addressing emerging adults' problematic substance use.

### Emerging Adulthood

American society has experienced massive demographic changes over the past 50 years that have transformed the expected life course. In particular, more young adults are pursuing higher education and delaying marriage and childbirth, and shifts in societal values have made both premarital sex and cohabitation commonplace among emerging adults. In response to these changes, Arnett (2000) proposed the theory of emerging adulthood, the developmental period that is typically the period from 18 to 25 years old. Substance abuse is especially prominent during emerging adulthood but decreases drastically thereafter (Arnett 2005). White et al. (2006) found that emerging adults' increases in heavy episodic drinking were associated with leaving their parents' homes.

### Social Development Model

This study applies the social development model to understand substance use among emerging adults. This model unifies key elements of social control, social learning, and differential association theories to understand how risk and protective factors influence substance use. Social control theory identifies precursors to substance use, while the social learning theory identifies processes that either deter or foster substance use. Differential association identifies the causal pathways for either using or abstaining from substances. Social bonds are an important element of the social development model because individuals who have social connections to *prosocial influences* (i.e., individuals who abstain from substance use) are less likely to experience substance-use-related problems. Conversely, youth who are bonded to individuals who use substances are at greater risk of using themselves. Applying a developmental perspective, the social development model identifies which socializing agents have the most influence during specific developmental periods. In addition, the social development model proposes reciprocal effects, which means past experiences can affect future behaviors differently at various developmental stages. For example, antecedents to substance use, such as incest, can become more salient at different stages of development (Catalano et al. 1996; Fleming et al. 2008).

**Incest**—Within the framework of the social development model, incest could have deleterious effects on an individual's ability to form trusting, prosocial relationships. Although researchers have yet to focus on incest specifically, some available studies have explored sexual abuse more broadly. Child sexual abuse has been associated with using tobacco (Jun et al. 2008; Topitzes, Mersky & Reynolds 2010), alcohol (Shin, Edwards & Heeren 2009; Shin, Hong & Hazen 2010), and illicit drugs (Fergusson, Boden & Horwood 2008; Ompad et al. 2005). However, these studies have not considered emerging adults as a distinct development group. Further, few studies have explored ways in which sexual abuse

and other covariates affect patterns of substance use. A notable exception is Shin et al.'s (2010) study exploring the influence of child sexual abuse and other covariates on patterns of substance use during adolescence.

**Determining classes of substance use**—Shin et al. (2010) used latent class analysis (LCA) on data from 1,019 youth involved in the Patterns of Youth Mental Health Care in Public Service Systems study to explore male and female patterns of alcohol, marijuana, amphetamines, cocaine, opioids, and hallucinogens usage. LCA is a person-centered analytic technique that uses individuals' responses to observed measures (i.e., survey questions) to identify clusters or latent classes of shared behavioral patterns among individuals (Collins & Lanza 2010). All respondents were between 13 and 18 years old, from a large metropolitan area, and were involved with at least one of the following systems: child welfare, juvenile justice, drug treatment, mental health, and public-school-based mental health. A majority of the sample (66%) was male.

Shin et al. (2010) identified four classes of substance use patterns for females and three classes for males. Female LCA results include: (1) heavy polysubstance use (17.7%); (2) high alcohol and marijuana and low amphetamine and cocaine (24.0%); (3) moderate usage alcohol and marijuana users (33.8%); and (4) abstainers or low users (24.5%). Male LCA results include: (1) heavy polysubstance use (29%); (2) high alcohol and marijuana and low amphetamine (50.5%); (3) abstainers or low users (20.5%). After latent class membership was regressed on covariates, for females only, childhood sexual abuse increased the likelihood of being in the class of moderate-use alcohol and marijuana users (OR = 2.61, 95% CI: 1.10-6.18), of being a high alcohol/marijuana and moderate-use amphetamine/cocaine user (OR = 4.75, 95% CI: 1.68-13.44), and of being in the heavy polysubstance-use class (OR = 4.85, 95% CI: 1.75-13.45).

### **Other Factors Associated with Substance Use during Emerging Adulthood**

Being depressed can elevate the risk of substance use to self-medicate (Arnett 2005). Depression has been associated with tobacco use (Audrain-McGovern et al. 2011; Lenz 2004), alcohol consumption, alcohol-related problems (e.g., school- or work-related problems) (Weitzman 2004), and illicit drug use (Repetto, Zimmerman & Caldwell 2008).

Parental alcohol use has been correlated with a greater risk of substance use (White & Jackson 2004). The rationale for using parental alcohol use as a covariate is to control for both genetic and social influences of a parent who drinks heavily (Wilson & Widom 2010).

A central task of emerging adults is moving towards making enduring commitments in love. Serious romantic involvements have been found to reduce substance use, while less serious relationships have been found to have minimal, if any, effects. Several studies have reported on the "marriage effect," wherein marriage reduces alcohol use, especially for men (c.f. Horwitz & White 1991; Leonard & Rothbard 1999; Umberson 1987). Marriage may function as a protective factor because it provides social support and social control (Umberson 1987). Cohabitation may have a similar effect. Bachman et al. (1997) found comparable rates of substance use among individuals who were cohabitating and engaged to be married. Fleming et al. (2010) used data from 909 emerging adults in the Pacific

Northwest who participated in the Raising Healthy Children project to examine the impact of romantic relationships on substance use. Respondents 18 to 20 years old were surveyed regarding cigarette, alcohol, and marijuana use, and relationship status. Respondents who were cohabitants reported higher rates of cigarette smoking and marijuana use than individuals who were single and not dating. Single emerging adults were more likely to engage in heavy drinking compared to those in serious committed relationships. The findings of this study supported the hypothesis developed from the social development model that social bonds can be a protective or risk factor, depending on the partner's substance-use patterns.

Research has found that emerging adults who continue to live with their parents engage in lower rates of substance use than emerging adults who have left their parents' homes (White et al. 2006; Gfroerer, Greenblatt & Wright 1997). Parents can provide daily monitoring of an emerging adult's behavior, and therefore exert control over substance use.

Although emerging adults as a group engage in high rates of substance abuse, there are exceptions. Blacks and Hispanics have lower rates of substance use compared to other racial groups, particularly Whites (Gil, Wagner & Tubman 2004; Johnston et al. 2011). After 35, substance use among Blacks "crosses over" to surpass the rates of other racial groups. This phenomenon is referred to as the *cross-over effect* (Watt & Rogers 2007). Research has also found that Hispanic females drink less than Hispanic males (Corbin, Vaughan & Fromme 2008).

### The Current Study

This study investigates whether depression, incest, and parental drinking correlated with different latent classes of substance use during emerging adulthood. Do romantic relationships and living with parents serve as protective factors against problematic patterns of substance use? This study adds to the literature by focusing on emerging adults using a national dataset, by including a wider range of substance use variables and by including covariates that have not previously been studied together. There are three hypotheses:

*Hypothesis 1:* Emerging adults will cluster into at least three distinct classes of substance-use behaviors, including a group with low substance use.

*Hypothesis 2:* Incest, depression, and parental drinking experienced during emerging adulthood will elevate the risk of substance-using behaviors.

*Hypothesis 3:* Being involved in a serious romantic relationship or living with parents will reduce the risk of substance-using behaviors.

## METHOD

### Study Design

We used data from Waves I, II, and III of the National Longitudinal Study of Adolescent Health Add Health dataset (see Harris et al. 2009). In 1994, in-school surveys were administered to 90,118 youth. From the school sample, an in-home sample was drawn that was stratified by sex and grade and consisted of 20,745 youth in Grades 7 through 12, which

includes ages 11 to 21 who were interviewed between 1994 and 1995. Between April and August 1996, a second wave of in-home interviews was conducted with 14,738 youth who had been interviewed for Wave I; at the time of the Wave II interviews, the respondents were between the ages of 12 and 21. Approximately six years later (August 2001 to April 2002), the sample was re-interviewed and Wave III data were collected from 15,197 emerging adults who were between the ages of 18 and 28. The institutional review board at the University of North Carolina at Chapel Hill approved all of the original Add Health study protocols and consent was obtained from all study participants.

Add Health selected both schools and individuals with unequal probabilities. As a result, appropriate steps must be made to ensure that analytic estimates are unbiased. We used Wave III sampling weights and survey analysis techniques that adjusted for the unequal probability of selection, clustered sampling design, and attrition of participants from prior waves.

### Study Sample

The study sample included 11,546 participants who participated in all three waves of the Add Health in-home survey data collection and who were emerging adults (i.e., 18 to 25 years old) at Wave III. Table 1 provides sample characteristics.

### Measures

**Substance use**—This study used 16 dichotomous *yes/no* items (yes = 1) that were asked in the Wave III survey to measure substance-use behaviors. Two items assessed cigarette use: (1) had the respondent ever tried a cigarette; and (2) had the respondent regularly smoked (defined as smoking at least one cigarette a day for 30 days). Eleven items focused on alcohol use behaviors. Unless otherwise specified, these questions used the prior 12 months as the time reference in assessing whether respondents had (1) drunk more than a sip or taste of beer, wine, or liquor on at least two or three occasions; (2) had experienced being drunk; (3) had a hangover; (4) had consumed five or more drinks on a single occasion; (5) had consumed five or more drinks in the past two weeks; (6) had been drunk at school or work once; (7) had experienced school or work problems because of drinking alcohol; (8) had experienced problems with their friends related to the respondent's alcohol consumption; (9) had experienced problems with dating related to respondent's drinking alcohol; (10) had ever regretted sex because of alcohol; and (11) had ever driven drunk.

The remaining three items asked respondents about their use of illicit drugs during the past seven years, since they were 11 to 18 years old. Specifically, the questions assessed whether respondents had: (1) used marijuana; (2) used other drugs; and (3) used cocaine (including crack, freebase, or powder).

**Demographics**—Respondents were asked their sex, race, Hispanic origin, educational attainment, and date of birth. Races included Black, White, Asian/Pacific Islander and other. Black race was dummy coded 1, with the other races serving as the referent. A separate dichotomous question asked, "Are you of Hispanic or Latino origin?" Hispanic ethnicity was coded as 1 with the referent being those who reported not being Hispanic. Educational

attainment ranged from not completing high school to beyond college. The dates of birth provided by respondents were used to calculate their ages. Education was unadjusted, and ages were standardized ( $M = 0$ ;  $SD = 1$ ).

### Risk and Protective Factors

**Incest**—During Wave III, respondents were asked if, prior to starting the sixth grade, “one of your parents or other adult caregivers touched you in a sexual way, forced you to touch him or her in a sexual way, or forced you to have sexual relations?” The sexual abuse response was dichotomized.

**Depression**—At Wave III, we used the 10-item modified version of the Center for Epidemiologic Studies–Depression (CES-D) scale to assess respondents’ level of depression. The summed scores for these questions were standardized ( $M = 0$ ;  $SD = 1$ ).

**Parental drinking**—The Wave I parent survey asked parents whether they had consumed five or more alcoholic drinks on one occasion in the past month (1 yes). The majority of parents who were surveyed were biological mothers (86.6%); biological fathers were the next largest group (4.1%), followed by adoptive mothers (2.8%) and grandmothers (1.8%). The rest of the respondents included adoptive fathers, stepmothers, stepfathers, other relatives and foster care providers.

**Relationship status**—Respondents reported whether they were currently married or cohabiting at Wave III. If respondents answered yes to the question “Are you still married?” then they were considered married. The measure for cohabitation combined a question that asked respondents if they had ever lived in a “marriage-like relationship” for at least one month and if they were “still living together.” Respondents who were not married or cohabiting were deemed single. Single serves as the referent to determine the impact of being in a serious romantic relationship on patterns of substance use.

**Live with parents**—Respondents were asked during Wave III if they lived with their parents (1 = yes).

### Statistical Analysis

Because the extent to which emerging adults engage in problematic substance-use behaviors cannot be captured with a single survey question, we chose to use LCA to identify the latent or unobserved subgroups based on the 16 observed substance-use variables. Data were prepared for analysis in Stata 12.1 and the LCAs were conducted in Mplus version 6.1. We modeled substance use as a categorical variable. To account for the sex differences reported in earlier studies, we conducted separate analyses for females and males. The first step of the modeling process was to fit the 16 substance-use variables with a model consisting of only one class. Then, the classes were increased in increments of one until seven classes were modeled. Similar to structural equation modeling, LCAs cannot be evaluated with a single indicator assessing model fit. Statistical outcomes, called *model fit* statistics, and evaluation of the usefulness of the model, called *model usefulness*, determine model fit. The model fit statistics include the log likelihood, the Bayesian Information Criteria (BIC), the Akaike

Information Criteria (AIC), and the Lo-Mendell Rubin Test (LMRT). Lower values are desired for the log likelihood, the BIC, and the AIC. LMRT tests indicate if the current model is preferred over a model with one less class (i.e., K classes versus K-1 classes). Entropy measures model usefulness and should be as close to one as possible (Collins & Lanza 2010). Another consideration is to determine if the fit makes sense based on the theory used. After determinations were made regarding the appropriate class structure, covariates (e.g., demographic, depression, and incest variables) were incorporated into the model in Mplus using multinomial logistic regression based on probability estimates of membership in latent classes. All analyses accounted for stratification, clustering and sampling weights.

## RESULTS

Table 2 provides the prevalence of the substance-use behaviors that form the class structure. The most frequent behavior among both females and males was drinking alcohol at least two to three times in the past year (78.04% and 79.74%, respectively). The least frequent behavior for females was being drunk at school or work (2.7%), whereas the least frequent behavior for males was experiencing problems at school or work due to alcohol consumption (8.3%).

The model fit and usefulness indices for one- to seven-class solutions are presented in Table 3, with the top row indicating the number of classes in the model and the lefthand side providing the fit indices used to evaluate the models. The three-class solution was chosen based on overall model fit and usefulness. Specifically, for both females and males, the three-class model had lower BIC and AIC statistics than the one- or two-class models. For both males and females, the three-class model also had the highest entropy value.

Table 4 depicts the probabilities of substance-use behaviors. The three classes reflect heavy use (females = 15.6%, males = 21.8%), moderate use (females = 40.2%, males = 44.8%), and normative substance-use behaviors (females = 44.3%, males = 33.5%). For both sexes, the respondents in the heavy-use class had the highest probabilities of consuming alcohol and using other substances, as well as highest likelihood of driving drunk and experiencing alcohol-related problems with friends, in dating relationships, as well as at work or school. Within each class, a few between-sex differences were evident when exploring the item probabilities. For example, in the heavy-use class, males were more likely than females to be drunk at school or work, to drive drunk, or to use cocaine. At the other end of the spectrum, respondents in the normative class had the lowest rates of substance use and the fewest problems associated with substance use. Males in the normative class were more likely than females to have been drunk or to have consumed five or more drinks in the past year and in the past two weeks, but females were more likely than males to have consumed alcohol two to three times in the past year.

Tables 5 and 6 provide the results as odds ratios (ORs) and 95% confidence intervals after class membership was regressed on the individual-level predictors in a multinomial logistic regression in Mplus. The normative latent class serves as the reference.

A history of incest nearly doubled the likelihood of heavy-use class membership versus the normative class for females only. Higher depression scores raised the risk of being in the heavy-use class by 49% for females and 34% for males. Having a parent who reported heavy drinking during the first wave of the Add Health Study more than doubled the risk of heavy-use class membership for female respondents and raised the risk by 62% for male respondents. Living with parents was a significant protective factor among emerging adults; females who lived with their parents were 45% less likely to be in the heavy-use class, and males who lived with their parents were 55% less likely to be in the heavy-use class of substance users.

For both females and males, Hispanics were less likely to be in the heavy-use class than the normative class (64% and 48%, respectively). Among both female and male respondents, the likelihood of being in the heavy-use substance-use class was significantly lower for Blacks than for the referent group consisting of all other racial groups (96% and 88%, respectively). For females only, the odds of being in the heavy-use class (as compared with the normative class) decreased by 19% for each one standard deviation increase in age; the odds of females being in the heavy-use class increased by 18% for each unit increase in education. Being depressed increased the risk of moderate-use class membership by 20% for females only. Parental drinking increased the risk of moderate-use class membership for females and males by 48% and 84%, respectively. For both females and males, being single increased the risk of moderate class membership by 53% and 41%, respectively. For both females and males, living with parents decreased the likelihood of moderate-use class membership by 35% for females and 22% for males. For each unit increase in education for females, the likelihood of moderate use membership increased by 20%, and for males the likelihood increased by 13%. For females only, being Hispanic reduced the likelihood of moderate-substance use class membership by 31%, compared to non-Hispanics. Members of the moderate-substance-use class were also less likely to be Black than other races, 76% less likely for females, and 67% less likely for males.

## DISCUSSION

This study used the social development model to explore whether incest, depression, parental drinking, living with parents, relationship status, and demographic characteristics (i.e., race, sex, age, and education) influenced patterns of substance use among emerging adults.

A key finding is the relationship between incest and membership in the heavy substance use group for female emerging adults, suggesting that victims of incest are especially vulnerable to self-medicating to cope with the aftermath of incest. Our work builds on Shin et al.'s (2010) study of adolescents from a large metropolitan area who were involved in systems (e.g., child welfare, mental health, and juvenile justice). However, our study uses a national dataset and includes a wider range of substances and substance-use-related problems, enhancing generalizability. We conducted separate analyses for males and females to account for sex-based differences. However, our results yielded three class models for both males and females, while Shin et al. (2010) found four classes for females and three classes for males. Shin et al. may have found more classes for females because they were exploring



adolescents who were involved with social service agencies, such as juvenile justice or child welfare. Service involvement may indicate an even greater risk of heavy polysubstance use than child sexual abuse alone. In addition, the respondents were adolescents and substance use may vary more for females during adolescence than emerging adulthood.

The findings regarding the relationship between depression and heavy substance use are consistent with previous literature (Weitzman 2004). However, our findings extend the existing literature by highlighting the patterns of polysubstance use and problems resulting from alcohol consumption. Moreover, it is possible that experiencing problems with friends or in dating relationships as well as at work or school could exacerbate the isolation that is typically experienced by people who are depressed. Given these findings, more resources should be targeted at addressing the co-occurrence of substance use and depression.

The findings regarding parental drinking differed by gender. Females' risk of being in the heavy-use class was more than doubled if a parent had reported drinking five or more drinks at one time during the Wave I data collection, whereas males had a 62% greater likelihood of class membership. The sex of the responding parent may provide one explanation for this difference, as the parents responding to this question were overwhelmingly females (94%). Thus, it might be that females are slightly more likely than males to model their behaviors after their mothers.

Regarding relationships, the finding that being single was a significant risk factor for both males and females is an important indicator of the social control that serious relationships can provide. This finding differs from the results of Fleming et al. (2010), who found increased marijuana use and smoking among cohabiting couples.

Similar to White et al. (2006), living with parents was a significant protective factor against membership in the heavy- and moderate-use classes for both males and females, which suggests the need to establish alternative forms of social controls among emerging adults. Females in the heavy-use class were more likely than males to be younger and more educated, suggesting that females might be especially vulnerable to risky substance-use behaviors during the transition to college life.

Finally, racial and ethnic differences in substance use were quite large and varied somewhat based on sex. Our findings provide support for the idea that Black and Hispanic emerging adults engage in lower substance use than other groups (Gil, Wagner & Tubman 2004; Johnston et al. 2011). For Black females, the risk of membership in the heavy or moderate substance-use classes was especially low. Thus, future studies need to explore which factors contribute to low rates of substance use among Black and Hispanic emerging adults, particularly females.

## Implications

From a research perspective, future studies should explore how the variables used in this study are predictive of substance use at different stages of development. In addition, researchers and clinicians need to concentrate their efforts on the social processes within a family that either thwart or foster substance use. In particular, researchers and practitioners

should delve into the dynamics of families with histories of incest to better understand the factors most associated with substance use. Likewise, studies should assess what characteristics of families support emerging adults remaining at home with their parents. Because it is possible that emerging adults who have better relationships with their parents are more likely to remain at home, clinicians should inquire about the familial relationships of emerging adults who live outside the home. Because serious romantic relationships can serve as protective factors for emerging adults, practitioners should explore whether emerging adults are romantically involved, whether relationships are exclusive, and the quality of those relationships. Finally, qualitative studies could be used to understand more fully the individual experiences of emerging adults who use substances.

This study included longitudinal data from when participants were adolescents to predict substance use during emerging adulthood. As a result, some of the predictive variables are longitudinal, but the outcome is cross-sectional. A limitation of this design is that it does not present information about how substance use changes over time. Despite this limitation, this design also furthers our understanding of substance use during emerging adulthood. Focusing on emerging adults provides a richer understanding of the issues that are germane to this developmental period. This study highlights the need for interventions and policies that target female survivors of incest who have a high risk of engaging in problematic substance use.

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**TABLE 1**  
**Weighted Sample Characteristics for Male and Female Respondents**

	Female		Male		Total	
Actual Sample Size	6145.00		5401.00		11, 546.00	
Weighted Sample Size	8, 989, 267.10		9, 109, 705.40		18, 098, 972.50	
Percent	53.22		46.78		100.00	
	<b>% or Mean</b>	<b>(SE)</b>	<b>% or Mean</b>	<b>(SE)</b>	<b>% or Mean</b>	<b>(SE)</b>
Age	21.60	(0.04)	21.74	(0.04)	21.67	(0.04)
Hispanic						
Yes	10.77		11.59		11.18	
Race						
Asian/ Pacific Islander	2.74		2.94		2.84	
Black	14.43		13.65		14.04	
White	72.70		72.15		72.42	
Other	10.13		11.27		10.70	
Education						
< High school	8.44		11.64		10.05	
High school/ GED	71.76		73.99		72.89	
Some college	6.83		5.54		6.18	
College	12.09		8.13		10.10	
Beyond college	0.87		0.70		0.79	
Relationship status						
Single	62.80		73.29		68.08	
Cohabitation	17.16		14.24		15.69	
Married	20.03		12.47		16.23	
Living situation						
Parents	36.86		45.42		41.17	
Another's home	5.05		5.36		5.20	
Own place	52.43		43.82		48.09	
Group quarters	5.22		4.41		4.81	
Other	0.44		0.99		0.72	
Incest victim *	4.49		4.24		4.36	
Parental drinking **	12.66		13.60		13.13	
Depression ***	6.11	(0.09)	4.70	(0.08)	5.39	(0.06)

Note: We have provided frequencies for categorical variables and means and standard errors for continuous variables. Some numbers may not sum to 100 due to rounding. Similarly, the standard errors for age were slightly above zero, but the rounding masks these values.

\*Incest includes sexual abuse experiences prior to starting the sixth grade wherein a parent or other adult caregiver touched the child in a sexual way, forced the child to engage in sexual touch, or forced the child to have sexual relations.

\*\*Parental drinking is a dichotomous measure capturing whether parents had consumed five or more alcoholic drinks on one occasion in the past month (1 = yes) during Wave I.

\*\*\*The CES-D is scored as follows: <10 indicates no depression, 10-14 indicates mild depression, and >14 indicates severe depressive symptoms. Scores ranged from 0 to 28. The values presented for depression are mean values.

**TABLE 2**  
**Number and Percentage<sup>I</sup> of Respondents Indicating Engagement in Substance Use Behaviors**

	Female	Male	Total
Actual Sample Size	6145.00	5401.00	11, 546.00
Weighted Sample Size	8, 989, 267.10	9, 109, 705.40	18, 098, 972.50
Percent	53.22	46.78	100.00
	%	%	%
Tried cigarette	75.23	76.45	75.84
Smoke regularly cigarette <sup>*</sup>	40.83	45.02	42.94
Drank alcohol 2-3 times past year <sup>**</sup>	78.04	79.74	78.89
Drunk at least once past year	49.66	59.31	54.52
Hungover past year	41.72	48.32	45.04
Drank 5 drinks past year	44.65	60.75	52.75
Drank 5 drinks past two weeks	25.82	44.91	35.43
Drunk at school/work past year	2.72	8.63	5.70
Alcohol school/work problems past year	4.85	8.33	6.60
Alcohol friend problems past year	6.31	10.77	8.55
Alcohol dating problems past year	9.85	12.30	11.08
Regretted sex because of alcohol past year	12.24	19.35	15.82
Driven drunk past year	19.19	34.25	26.77
Used marijuana past 7 years	41.83	52.35	47.13
Used other drugs past 7 years	15.12	20.92	18.04
Used cocaine past 7 years	8.70	13.87	11.30

Note:

<sup>I</sup>Values are based on the weighted sample.

<sup>\*</sup>Smoked regularly means smoked at least one cigarette a day for 30 days.

<sup>\*\*</sup>Drunk more than a sip or taste of beer, wine, or liquor on at least two or three occasions.

**TABLE 3**  
**Indicators of Fit with One through Seven Latent Classes by Sex**

	1	2	3*	4	5	6	7
LL – Males	-37547.30	-33399.88	- <b>32329.95</b>	-31859.45	-31612.82	-31414.20	-31310.11
LL – Females	-39010.56	-34186.50	- <b>33210.34</b>	-32733.08	-32489.81	-32321.30	-32220.68
BIC – Males	75232.11	67083.38	<b>65089.62</b>	64294.71	63947.57	63696.42	63634.35
BIC – Females	78160.70	68660.88	<b>66856.85</b>	66050.64	65712.39	65523.65	65470.71
BIC SSA – Males	75181.27	66978.51	<b>64930.74</b>	64081.81	63680.64	63375.47	63259.38
BIC SSA – Females	78109.85	68556.01	<b>66698.96</b>	65837.73	65445.46	65202.70	65095.74
AIC – Males	75126.60	66865.76	<b>64759.90</b>	63852.89	63393.64	63030.39	62856.22
AIC – Females	78053.12	68439.00	<b>66520.68</b>	65600.17	65147.63	64844.59	64677.35
LRT – Males		8238.45	<b>2125.31</b>	934.62	489.90	394.55	425.87
<i>P</i> value – Males		0.000	<b>0.000</b>	0.001	0.122	0.056	0.670
LRT – Females		9583.49	<b>1939.25</b>	948.12	483.28	334.78	199.89
<i>P</i> value – Females		0.000	<b>0.000</b>	0.010	0.106	0.640	0.245
Entropy – Males		0.79	<b>0.81</b>	0.80	0.76	0.77	0.75
Entropy – Females		0.81	<b>0.81</b>	0.79	0.79	0.78	0.76

*Note.* LL = Log Likelihood; AIC = Akaike Information Criteria; BIC = Bayesian Information Criteria; BIC SSA = sample-size-adjusted BIC; LRT = Lo-Mendell Rubin Test.

\*The three-class model is bold-faced to indicate that it was the model chosen.

**TABLE 4**  
**Mean Probabilities of Latent Class Indicators for Three-Class Solution**

	<u>Heavy Use</u>		<u>Moderate Use</u>		<u>Normative</u>	
	Female	Male	Female	Male	Female	Male
Tried cigarette	0.96	0.96	0.88	0.85	0.57	0.53
Smoke regularly cigarette	0.80	0.80	0.64	0.63	0.59	0.66
Drank alcohol 2-3 times	0.96	0.96	1.00	1.00	0.53	0.44
Drunk at least once	0.99	0.97	0.88	0.88	0.12	0.19
Hung over	0.93	0.90	0.71	0.69	0.08	0.09
Drank 5/>drinks past year	0.98	0.98	0.74	0.90	0.13	0.21
Drank 5/>drinks past two weeks	0.76	0.83	0.36	0.64	0.05	0.10
Drunk at school/work	0.13	0.30	0.02	0.06	0.00	0.00
Alcohol school/work problems	0.26	0.32	0.03	0.04	0.00	0.01
Alcohol friend problems	0.30	0.39	0.05	0.06	0.00	0.01
Alcohol dating problems	0.42	0.40	0.09	0.10	0.01	0.00
Regretted sex because of alcohol	0.49	0.53	0.12	0.19	0.02	0.04
Driven drunk	0.68	0.86	0.22	0.37	0.04	0.08
Used marijuana	0.95	0.96	0.52	0.58	0.14	0.17
Used other drugs	0.56	0.65	0.14	0.13	0.01	0.02
Used cocaine	0.39	0.50	0.06	0.05	0.00	0.01

**TABLE 5**  
**Females' Odds Ratios Comparing Substance Use Classes to the Normative Class**

	<u>Heavy vs. Normative</u>		<u>Moderate vs. Normative</u>	
	Odds	95% CI	Odds	95% CI
Hispanic	0.36 <sup>***</sup>	[0.24, 0.54]	0.69 <sup>**</sup>	[0.53, 0.91]
Black	0.04 <sup>***</sup>	[0.02, 0.07]	0.24 <sup>***</sup>	[0.19, 0.31]
Age	0.81 <sup>***</sup>	[0.70, 0.93]	0.94	[0.86, 1.04]
Education	1.18 <sup>*</sup>	[1.03, 1.35]	1.20 <sup>**</sup>	[1.08, 1.34]
Single	2.71 <sup>***</sup>	[1.97, 3.73]	1.53 <sup>***</sup>	[1.25, 1.87]
Live with parents	0.55 <sup>***</sup>	[0.41, 0.73]	0.65 <sup>***</sup>	[0.54, 0.78]
Incest	1.83 <sup>*</sup>	[1.14, 2.94]	0.87	[0.58, 1.30]
Depression	1.49 <sup>***</sup>	[1.33, 1.68]	1.20 <sup>***</sup>	[1.09, 1.32]
Parental drinking	2.11 <sup>***</sup>	[1.53, 2.90]	1.48 <sup>***</sup>	[1.14, 1.92]

<sup>\*</sup>  $p < 0.05$ ,

<sup>\*\*</sup>  $p < 0.01$ ,

<sup>\*\*\*</sup>  $p < 0.001$ .

*Note.* Normative is the referent for both heavy and moderate use. Hispanic was equal to 1 for individuals who responded *yes* to a question asking if they were of Hispanic decent and zero for those who responded *no*. Thus, the referent group for Hispanics was non-Hispanics. Because of their low substance use during emerging adulthood, Black was given a value of 1 and the referent group contained individuals who identified as Asian/Pacific Islander, White, and other.



**TABLE 6**  
**Males' Odds Ratios Comparing Substance Use Classes to the Normative Class**

	<u>Heavy vs. Normative</u>		<u>Moderate vs. Normative</u>	
	Odds	95% CI	Odds	95% CI
Hispanic	0.52 **	[0.34, 0.81]	0.79	[0.59, 1.05]
Black	0.12 ***	[0.07, 0.19]	0.33 ***	[0.25, 0.46]
Age	0.94	[0.84, 1.06]	1.06	[0.96, 1.17]
Education	1.01	[0.89, 1.14]	1.13 *	[1.02, 1.26]
Single	2.28 ***	[1.63, 3.19]	1.41 **	[1.10, 1.82]
Live with parents	0.45 ***	[0.35, 0.59]	0.78 *	[0.62, 0.98]
Incest	1.78	[0.90, 3.56]	0.70	[0.38, 1.28]
Depression	1.34 ***	[1.19, 1.52]	1.02	[0.90, 1.16]
Parental drinking	1.62 **	[1.13, 2.33]	1.84 ***	[1.35, 2.50]

\*  $p < 0.05$ ,

\*\*  $p < 0.01$ ,

\*\*\*  $p < 0.001$ .

*Note.* Normative is the referent for both heavy and moderate use. Hispanic was equal to 1 for individuals who responded *yes* to a question asking if they were of Hispanic decent and zero for those who responded *no*. Thus, the referent group for Hispanics was non-Hispanics. Because of their low substance use during emerging adulthood, Black was given a value of 1 and the referent group contained individuals who identified as Asian/Pacific Islander, White, and other.