

Socioeconomic Status and Substance Use Among Young Adults: A Comparison Across Constructs and Drugs

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ABSTRACT. Objective: Little consensus exists regarding the relationship between socioeconomic status (SES) and substance use. This study examined the associations of three indicators of family SES during childhood—income, wealth, and parental education—with smoking, alcohol use, and marijuana use during young adulthood. **Method:** Data were obtained from the national Panel Study of Income Dynamics, a survey of U.S. families that incorporates data from parents and their children. In 2005 and 2007, the Panel Study of Income Dynamics was supplemented with two waves of Transition into Adulthood data drawn from a national sample of young adults, 18–23 years old. Data from the young adults ($N = 1,203$; 66.1% White; 51.5% female) on their current use of alcohol, cigarettes, and marijuana were used as outcome variables in logistic regressions. Socioeconomic background was calcu-

lated from parental reports of education, wealth, and income during the respondent's childhood (birth through age 17 years). **Results:** Smoking in young adulthood was associated with lower childhood family SES, although the association was explained by demographic and social role covariates. Alcohol use and marijuana use in young adulthood were associated with higher childhood family SES, even after controlling for covariates. **Conclusions:** Findings based on three indicators of family background SES—income, wealth, and parental education—converged in describing unique patterns for smoking and for alcohol and marijuana use among young adults, although functional relationships across SES measures varied. Young adults with the highest family background SES were most prone to alcohol and marijuana use. (*J. Stud. Alcohol Drugs*, 73, 772–782, 2012)

ALCOHOL AND OTHER DRUG USE is costly to society, with estimated annual expenses of \$185 billion in the United States for alcohol (Harwood, 2000) and \$181 billion for other drug use and consequences (Office of National Drug Control Policy, 2004; Rice, 1999). Substance use has a negative impact on public health and human development. Familial socioeconomic status (SES) is associated with substance use, yet there is little consensus on how the two are related (e.g., Hanson and Chen, 2007; Huckle et al., 2010). A variety of outcomes for children and adolescents—cognition, health behaviors, antisocial behavior, educational attainment (Conger et al., 2010; Duncan and Brooks-Gunn, 1999)—have well-documented links with family SES. In this article, we explore the relationship between childhood SES and substance use during young adulthood, when substance use tends to peak. Using a study uniquely suited to provide SES data from parents and substance use reports from young adults, we examine how family SES can help explain who is at risk for higher levels of substance use in young adulthood.

We focus on the relationship between SES during childhood and substance use behaviors during young adulthood for two reasons. First, the peak in substance use in the early twenties has been well documented (Chassin et al., 2009; Johnston et al., 2011; Park et al., 2006); identifying precursors and risk factors for this vulnerable time should be a primary public health focus. Second, assessing the associations of SES in childhood and adolescence (i.e., birth through age 17 years) with young adult substance use will help identify the most appropriate targets for prevention programs. Many substance use prevention and intervention programs target individuals in middle school and high school (Tobler et al., 2000). Therefore, understanding the contexts of individuals at risk for engaging in the highest levels of substance use will help in implementing cost-effective prevention programming that is salient and most likely to be effective.

Some studies have found a greater likelihood of substance use among youth from families with higher SES. Based on a composite index of SES, young adults from families with higher SES tend to consume alcohol in greater quantities and frequencies (Martin and Pritchard, 1991). Children of more affluent families may be at greater risk, specifically, for engagement in anxiety- and depression-related substance use (Luthar, 2003; Luthar and Latendresse, 2005). Luthar (2003) has suggested that risk may increase for children in affluent families because they experience greater achievement pressure combined with isolation from parents who have careers that are more demanding. In addition, parents in high-SES

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families compared with those in lower SES families may have attitudes that are more tolerant toward substance use (Luthar and Goldstein, 2008). However, the extent to which these patterns are found in national samples is unknown (Luthar and Latendresse, 2005). In a meta-analysis of the literature pertaining to adolescents ages 10–21 years, lower SES was associated with more smoking; there was no clear pattern of SES with alcohol or marijuana use, and no negative health factors were associated with high SES (Hanson and Chen, 2007). Discrepant results suggest that additional research is required.

Various indicators of SES have been used to examine related but distinct aspects of economic conditions. Indicators of SES are often studied in isolation, making comparisons across SES constructs as they relate to substance use difficult. Three commonly used SES markers are considered here. First, family income, frequently used as a primary SES marker, has not shown a clear relationship with various forms of substance use. Higher family income may be associated with substance use because of the increased ability to access or purchase substances and to have social associations with others who also have financial resources. On the other hand, lower income may be related to substance use as a coping mechanism because of increased stress and less access to alternative activities. Previous studies have not yielded consistent findings in these areas (Huckle et al., 2010). Among adolescents in the Youth Risk Behavior Surveillance Study, family income was negatively associated with smoking and heavy episodic drinking (Lowry et al., 1996). However, in the Add Health study, household income was inversely related to smoking and positively related to alcohol use (Goodman and Huang, 2002).

Wealth, typically defined as the total value of a household's nonliquid assets (e.g., housing equity, stocks, savings) minus the value of debts and liabilities (e.g., mortgages, credit card debt), is a better measure of more permanent or lifetime economic status of families. Wealth and income are independent indicators of economic status and are correlated at just .32 (Díaz-Giménez et al., 1997). In addition, wealth is distributed much more unequally than income; some studies demonstrate that wealth inequality is 10 times greater than income inequality in the United States (Díaz-Giménez et al., 1997). Despite the usefulness of wealth for conveying economic status and showing an impact on psychological health (Luthar, 2003), empirical study of the relationship between parental wealth and substance use behaviors among young adults is lacking.

Finally, parental education is a common indicator of SES and an important contributor to child development (Davis-Kean, 2005). Among adolescents in the Youth Risk Behavior Surveillance Study, lower education level of adults in the home was associated with a greater risk of smoking and heavy episodic drinking (Conley, 1999). In the national Monitoring the Future study (Johnston et al., 2011), adoles-

cents whose parents were least educated tended to have the highest proportion of drug users among 8th and 10th graders, although for marijuana and alcohol the association between parental education and substance use became positive by 12th grade. The associations between cigarette smoking and parental education continued to be negative throughout high school (Johnston et al., 2011).

Data limitations have prevented prior studies from assessing the comparative and joint roles of the three indicators of SES in determining substance use among young adults. Such data limitations arise for two primary reasons. First, SES factors are typically not the focal point of surveys of health behaviors and thus receive limited interview time. Second, young respondents may not be the most reliable reporters of family SES; although adolescents and young adults are necessarily the primary responders to assess their own substance use, they typically do not know the intricacies of their parents' family income and wealth. As a result, surveys with information on substance use among young adults typically rely on parental education, more likely to be reported accurately by a young adult, as the primary indicator of family background SES. The data used in the current study overcome these limitations by obtaining self-reports of substance use by young adults combined with detailed self-reports of income, wealth, and education by their parents.

Research questions

The current study examined two questions: (a) How are three different indicators of SES—family income, family wealth, and parental education—associated with substance use (i.e., smoking, drinking, heavy episodic drinking, and marijuana use) in young adulthood, and (b) controlling for demographics (i.e., age, race, gender), family background characteristics (i.e., parents' marital status, parent age), and young adult concurrent social role status (i.e., attending college, working, living with parents, married, cohabiting, parenting), which family SES indicators are most strongly associated with young adult substance use? A number of covariates were used in the current study to control for relevant background characteristics and young adult experiences. Demographics and family background characteristics were control variables to isolate the effects of SES during childhood. Social role statuses in young adulthood—including education, employment, residence, and relationship status—were concurrent control variables.

Method

Participants

The Panel Study of Income Dynamics (2011) is the longest-running, nationally representative, longitudinal household survey in the United States. It began in 1968

with a sample of roughly 18,000 individuals living in 5,000 households. Although the Panel Study of Income Dynamics focuses on employment and income experiences of respondent households, a great deal of other information is also collected. In 1997, Panel Study of Income Dynamics children from birth to age 12 years residing in respondent households were recruited into the Child Development Supplement. In 2005 and 2007, participant children who ended high school (graduated or dropped out) and were at least 18 years old were interviewed over the telephone as part of the Transition into Adulthood survey.

The Panel Study of Income Dynamics sample is composed of two subsamples: a nationally representative subsample and an oversample of low-income households. Through the application of sampling weights, the full sample was initially representative of the U.S. population. Each person born to or adopted by a sampled person since 1968 has become a sampled person herself/himself. As a result, the sample has expanded as children raised in respondent households have begun to form their own independent families. In this way, the sample has continued to be representative of nonimmigrant U.S. households (Fitzgerald et al., 1998). In 1997, the core samples were “refreshed” with the addition of a subsample of immigrant families, and the Panel Study of Income Dynamics came to be representative of the entire U.S. population once again (Hofferth et al., 1999). Thus, the Child Development Supplement sample is itself representative of children from birth through age 12 years living in the United States in 1997. The attrition rate between the 1997 wave of Child Development Supplement

interviews and the 2005 wave of Transition into Adulthood interviews was 11.2%. For the 2007 wave of interviews, the cumulative response rate was 77%. At each wave, sampling weights accounted for both attrition and the unequal household selection probabilities from the original Panel Study of Income Dynamics sampling frame. Consequently, the Transition into Adulthood sample is, at each point in time, representative of young adults who were ages 0–12 years in 1997. We pooled across the 2005 and 2007 waves of the Transition into Adulthood survey ($N = 1,853$ responses from $N = 1,203$ individuals). We also restricted the sample to respondents’ first Transition into Adulthood interview to determine if our findings were driven by individuals who appeared in both waves. Results were replicated; findings were similar in magnitude and statistically significant for the high-SES categories. Sample characteristics are provided in Table 1. The mean age was 19.5 years ($SD = 1.55$), 32% of the sample were non-White, and 51.5% were female.

Measures

In young adulthood, current cigarette smoking was measured by asking, “Do you smoke cigarettes?” (0 = no, 1 = yes). Questions regarding alcohol consumption included current drinking and frequent heavy episodic drinking. Current drinking was assessed with the question, “Do you ever drink any alcoholic beverages such as beer, wine, or liquor?” (0 = no, 1 = yes). Frequent heavy episodic drinking was assessed with, “In the last year, on how many days have you had (if male ‘five’/if female ‘four’) or more drinks on

TABLE 1. Sample characteristics

Variable	Sample	Average income		Average wealth		Parental education	
		Bottom quartile	Top quartile	Bottom quartile	Top quartile	No high school	Post-graduate
Age							
17–18 years	30.4%	29.4%	33.2%	30.9%	33.7%	25.9%	28.6%
19–20 years	44.5%	45.3%	42.3%	44.4%	41.5%	46.1%	44.7%
21–22 years	22.3%	23.3%	22.4%	21.6%	21.8%	24.0%	23.9%
≥23 years	2.8%	2.0%	2.1%	3.1%	3.0%	4.0%	2.9%
Non-White	32.2%	70.7%	13.1%**	59.8%	16.1%**	68.1%	16.8%**
Female	51.5%	54.6%	51.1%	52.9%	49.9%	56.6%	59.3%
Family background							
Parents married in 1997	72.7%	51.0%	85.3%**	46.7%	84.2%**	58.3%	82.6%**
Household head’s age in 1997, <i>M</i> years	40.209	38.696	42.694**	38.053	43.404**	40.610	44.042**
High school graduate	89.7%	77.7%	97.8%**	80.8%	95.8%**	79.3%	99.2%**
Educational and employment status							
Working only	34.9%	41.7%	17.4%**	41.0%	22.4%**	39.3%	10.6%**
Student	50.4%	32.4%	73.7%**	34.3%	67.8%**	36.7%	85.0%**
Residence and relationship status							
Lives with parents	70.4%	73.3%	69.8%	68.5%	67.5%	68.4%	62.3%
Married	5.1%	3.5%	2.6%	6.0%	4.5%	3.8%	4.4%
Cohabiting	12.2%	19.1%	3.6%**	17.4%	3.5%**	15.7%	2.4%**
Ever been pregnant/fathered a child	15.9%	29.1%	3.8%**	29.5%	6.2%**	28.7%	4.4%**
Sample size, <i>n</i>	1,853	539	410	552	372	322	110

Note: Statistics are percentages except for household head’s age in 1997 and sample size.

** $p < .01$ for the difference between bottom and top income and wealth quartiles and the high and low parental education categories.

one occasion?"; it was coded as 1 = 12 or more occasions in the past year (on average, once a month or more), and 0 = fewer occasions. The frequency of marijuana consumption was measured by use in the past year with the question, "On how many occasions (if any) have you used marijuana in the past 12 months?" (0 = none, 1 = any). This measure is constructed from categorical responses that range from 1–2 occasions to 40 or more. Of those respondents with a positive value, the percentage reporting less than 12 times a year is roughly equal to the percentage reporting at least 12 times a year.

Three different measures of household SES were included based on parental responses: average household income, average household wealth, and parental education. The income and wealth measures were each calculated by averaging over the respondent's childhood and adolescence (i.e., birth to age 17 years). Average household income per person was generated by dividing annual total family income by family size for each wave to account for differences in the number of people across families. Average household wealth per person was the total value of owned vehicles, real estate and business holdings, checking and savings accounts, stocks, retirement savings, and trusts less the value of any liabilities against these assets and other debts. (Asset information was collected every 5 years from 1984 to 1999 and, since 2001, as part of the regular biennial survey.) This measure was also adjusted for family size. To allow for flexible nonlinear relationships, each measure was divided into quartiles and dummy coded. A categorical index was used for parental education at the time of the respondent's first Child Development Supplement survey year, with responses of 1 = *less than high school completion*, 2 = *completed high school*, 3 = *some college/postsecondary education*, 4 = *completed college*, and 5 = *postgraduate or professional school after college*. Mother's and father's scores were averaged; if only one parent's education was reported, that score was used. Parental education was most highly correlated with income ($r = .52$) and to a lesser extent with wealth ($r = .17$). Similar to rates found in prior studies of the United States, income and wealth were correlated at a modest level ($r = .34$).

Control variables for the young adult's own education, employment, and background were also included based on self-reports. Educational attainment was measured as whether or not the respondent was a General Educational Development (GED) credential recipient or a high school graduate (the reference group being high school dropouts). Educational and employment statuses were included as dummy variables for whether the respondent was working exclusively or in school (the reference group reporting neither, or "idle"). Residence and relationship status included whether the respondent was living with his or her parents, cohabiting or married, and had ever fathered a child or been pregnant. Family background variables included controls for parents' marital status and age of the household head, both measured

in 1997 (first wave of the Child Development Supplement). We also include a dummy variable for the interview year, 2005 versus 2007 (the reference).

Plan of analysis

Logistic regressions were used to estimate the models. Odds ratios and standard errors were corrected for clustering, given that the sample included siblings and, in some cases, multiple responses from the same individual. The 1,853 observations comprising our analytic sample came from 1,203 unique respondents (650 entered the Transition into Adulthood sample in 2005 and were reinterviewed in 2007). Of the unique respondents, there are 179 sibling pairs and 1 sibling quartet. For each substance use measure, a series of nested specifications was tested. First, each outcome was individually regressed on each SES measure controlling only for race, gender, and the interview year. These results are reported by SES measure (i.e., average income, average wealth, parental education) in the first data column shown for each outcome in Table 3. The second data column for each outcome in Table 3 presents the results obtained after adding controls for the respondent's educational attainment, education and employment status, family status, family background, and religiosity. Therefore, every column presents the results from three separate regression analyses, one for each of the three SES constructs. We also conducted additional analyses using combinations of the three SES measures.

Results

Descriptive statistics for the covariates and substance use outcomes and measures of SES are presented in Tables 1 and 2, separately by the highest and lowest SES categories. Table 2 also reports the minimum and maximum values for (per capita) income and wealth for the sample as a whole and for the bottom and top quartiles. Ranges illustrate that these measures capture different aspects of SES. For example, the top income quartile includes households with negative net worth and, conversely, within the lowest income and parental education categories are households with relatively substantial wealth.

Turning to the substance use measures, observed descriptive patterns were generally consistent across SES measures. Cigarette smoking was more prevalent in young adults raised in households with lesser resources. Alcohol use, heavy episodic drinking, and marijuana use were all more prevalent among young adults raised in households with greater resources. Moreover, the magnitude of the differences in prevalence rates between the top quartile and the bottom quartile for income versus wealth were quite similar. For example, smoking rates in the low versus high quartile were 26.7% versus 16.5% based on income and 27.4% versus 18.2% based on wealth.

TABLE 2. Summary statistics for substance use and socioeconomic status measures

Variable	Sample	Average income		Average wealth		Parental education	
		Bottom quartile	Top quartile	Bottom quartile	Top quartile	No high school	Post-graduate
Whether smokes	24.0%	26.7%	16.5%*	27.4%	18.2%*	24.4%	9.8%*
Whether drinks	64.9%	51.0%	75.8%*	53.0%	74.6%*	53.7%	82.1%*
Heavy episodic drinking ^a	19.6%	8.3%	28.8%*	7.0%	29.0%*	9.8%	36.7%*
Marijuana in previous 12 months	28.0%	19.3%	39.1%*	20.2%	38.5%*	20.3%	40.1%*
Parental education							
No high school	17.6%	50.6%	0.6%*	40.4%	1.8%*	100.0%	0.0%*
Completed high school	22.0%	28.3%	3.2%*	28.4%	11.0%*	0.0%	0.0%
Some postsecondary education	32.3%	18.3%	25.2%†	27.5%	23.9%	0.0%	0.0%
Completed college	20.0%	1.3%	46.8%*	2.3%	41.1%*	0.0%	0.0%
Some postgraduate education	7.6%	0.0%	24.1%*	0.9%	22.1%*	0.0%	100.0%*
Average income per person, U.S.\$ ^b	15,994	4,872	32,250*	7,079	28,739*	6,385	32,668*
(SD)	(14,383)	(1,754)	(19,934)	(4,247)	(21,678)	(4,234)	(21,300)
Minimum	867	867	19,309	867	6,352	1,114	8,412
Maximum	196,461	7,697	196,461	29,217	196,461	32,552	121,380
Average wealth per person, U.S.\$ ^c	53,419	4,981	150,892*	919	173,541*	7,445	135,229*
(SD)	(230,181)	(10,248)	(440,013)	(3,214)	(438,299)	(12,190)	(161,688)
Minimum	-30,931	-30,931	-4,122	-30,931	45,190	-8,196	-286
Maximum	5,687,799	62,576	5,687,799	4,074	5,687,799	64,904	755,827

Note: Statistics are percentages except for the average income per person and average wealth per person data. ^aAt least four drinks (for females) or five drinks (for males) per occasion, 12 or more times per year; ^baverage income per person was generated by dividing annual total family income by family size for each wave to account for differences in the number of people across families; ^caverage household wealth was the total value of owned vehicles, real estate and business holdings, checking and savings accounts, stocks, retirement savings, and trusts less the value of any liabilities against these assets and other debts, adjusted for family size.

† $p < .10$; * $p < .05$.

Figures 1a–1d show the patterns in substance use behavior by each measure in greater detail. The lines for income and wealth were constructed by calculating the average of the indicated behavior within each percentile of the distribution and then fitting a locally weighted regression, essentially a moving average process that put greater weight on neighboring observations, to investigate potential nonlinearity. Because the years of parental education were highly concentrated at certain levels, such as high school graduate, the prevalence of substance use was placed at the value along the x axis associated with the proportion of parents with a given level of education. For example, 40% of young adults

have parents whose education is less than or equal to a high school education, and therefore the prevalence of substance use for young adults whose parents have a high school education is plotted at the 40th percentile on the x axis. Patterns of income, wealth, and education were remarkably similar, despite education not being a continuous variable.

Smoking and SES had a nonlinear relationship: rates actually increased with income and wealth until roughly the 20th or 30th percentile and then fell throughout most of the rest of the income and wealth distribution. For drinking and heavy episodic drinking, the relationship with income and wealth was fairly constant throughout the entire distribu-

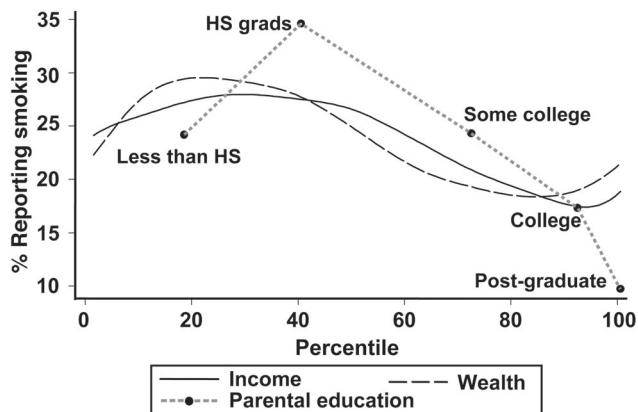


FIGURE 1A. Percentage reporting current smoking according to income percentile, wealth percentile, and parental education. HS = high school.

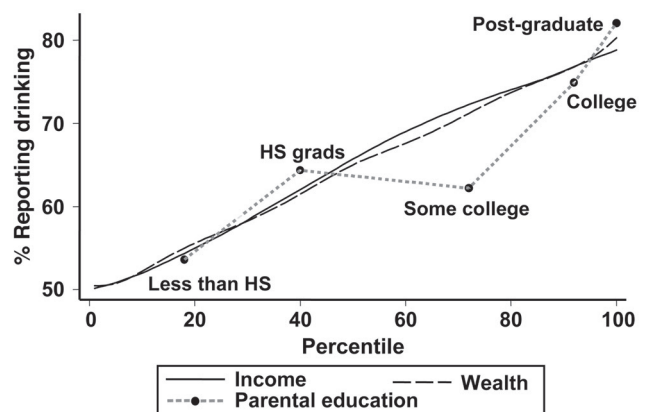


FIGURE 1B. Percentage reporting current drinking according to income percentile, wealth percentile, and parental education. HS = high school.

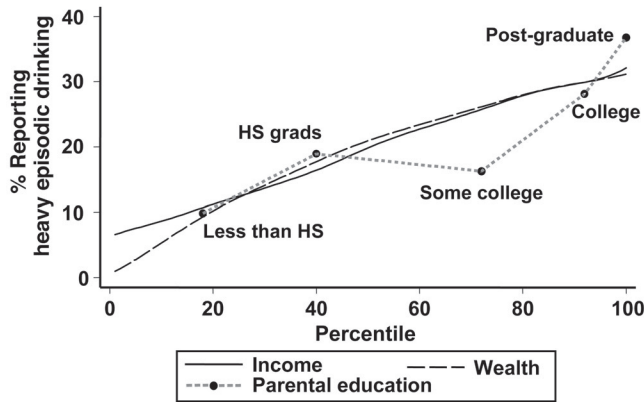


FIGURE 1C. Percentage reporting heavy episodic drinking 12 or more times per year according to income percentile, wealth percentile, and parental education. HS = high school.

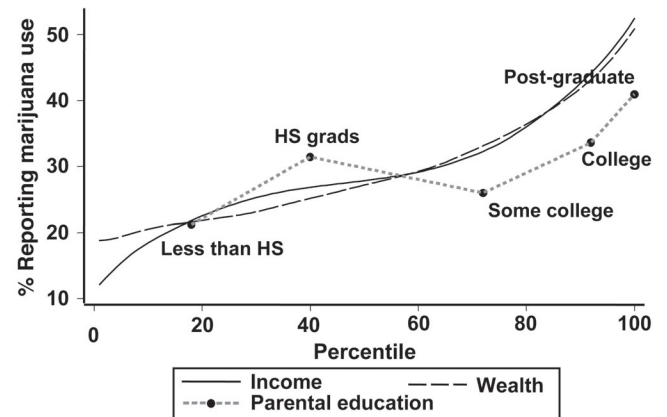


FIGURE 1D. Percentage reporting marijuana use in past year according to income percentile, wealth percentile, and parental education. HS = high school.

tion. For marijuana, although rates of use increased at all levels of income and wealth, the increase was greatest at the lowest and highest levels of income and wealth. For all four outcomes, the association between substance use and income was very similar to the association between substance use and wealth.

The patterns by parental education were generally consistent with the patterns by income and wealth, with one important exception. Drinking, heavy episodic drinking, and marijuana use were not higher for young adults whose parents had some college education versus a high school degree. That is, in the middle of the parental education distribution, use of these substances did not vary substantially. However, for parental income and wealth, smoking declined and drinking, heavy episodic drinking, and marijuana use increased as wealth and income rose through the middle of the distribution.

Smoking

The multivariate substance use results are reported for covariates in Table 3. Effects of covariates are shown in Table 4. Smoking results are reported in the first panel (“Current smoking”) of Table 3. Higher SES individuals were less likely to smoke according to all three measures but only in the absence of covariates. For example, young adults whose parents had some postgraduate experience had one fifth the odds of being current smokers compared with young adults whose parents did not complete high school. This differential persisted once covariates were added to the model, although none of the SES indicators remained statistically significant. Considering the effects of the covariates (Table 4), the odds of smoking were lower among non-White young adults and women. In addition, high school graduates and those currently in school were less likely to smoke than nongraduates

and nonstudents, respectively. Young adults in cohabiting relationships (and those who had ever been pregnant or fathered a child, at a trend level of significance) were more likely to smoke than those who were not in either marital or cohabiting relationships.

Alcohol use

The results from the alcohol consumption models are presented in the second panel (“Current drinking”) and third panel (“Heavy episodic drinking”) of Table 3. Across all three measures of SES, the odds of current drinking increased with higher SES. Young adults in the highest income, highest wealth, and highest parental education had at least twice the odds as those in the lowest SES categories of being current drinkers. Moreover, this pattern did not change substantially in direction or magnitude when covariates were added to the models. Concerning the covariates, age was a predictor, with the greatest odds of drinking among individuals ages 21–22 years. White young adults and men were more likely to be current drinkers. There was a trend toward married young adults being less likely to be current drinkers.

In contrast to current drinking, heavy episodic drinking (at least four/five drinks for women/men per occasion on 12 or more occasions in the past year) was predicted most robustly by wealth rather than by income or education. Relative to low-wealth respondents, respondents in each of the remaining three wealth quartiles had significantly greater odds for heavy episodic drinking, even with the addition of covariates. However, none of the income effects was significant in the full model with covariates, and parental education generated significantly greater odds only among respondents raised by postgraduate-educated parents relative to low parental education. Covariates were

TABLE 3. Logistic regressions predicting substance use

Variable	Current smoking		Current drinking		Heavy episodic drinking ^a		Marijuana use ^b	
	Baseline	Covariates	Baseline	Covariates	Baseline	Covariates	Baseline	Covariates
Average income								
Quartile 1 (ref.)	—	—	—	—	—	—	—	—
Quartile 2	0.63 [†]	0.98	1.22	1.18	1.27	1.05	1.18	1.34
	[0.38, 1.06]	[0.56, 1.69]	[0.79, 1.89]	[0.76, 1.83]	[0.66, 2.47]	[0.53, 2.08]	[0.68, 2.03]	[0.76, 2.34]
Quartile 3	0.43*	0.92	1.76*	1.69*	1.65	1.14	1.05	1.31
	[0.24, 0.75]	[0.51, 1.66]	[1.09, 2.85]	[1.03, 2.76]	[0.87, 3.14]	[0.57, 2.29]	[0.61, 1.81]	[0.73, 2.35]
Quartile 4	0.26*	0.70	2.34*	2.30*	2.29*	1.50	1.93*	2.53*
	[0.14, 0.47]	[0.37, 1.32]	[1.42, 3.86]	[1.34, 3.95]	[1.22, 4.30]	[0.73, 3.08]	[1.15, 3.24]	[1.39, 4.62]
Average wealth								
Quartile 1 (ref.)	—	—	—	—	—	—	—	—
Quartile 2	0.85	1.08	1.19	1.10	2.17*	1.81 [†]	1.09	1.04
	[0.53, 1.38]	[0.64, 1.84]	[0.77, 1.83]	[0.70, 1.72]	[1.19, 3.95]	[0.97, 3.39]	[0.67, 1.77]	[0.62, 1.73]
Quartile 3	0.42*	0.73	1.55 [†]	1.43	2.59*	2.09*	1.25	1.35
	[0.25, 0.69]	[0.43, 1.24]	[1.00, 2.40]	[0.89, 2.28]	[1.41, 4.75]	[1.10, 3.98]	[0.74, 2.11]	[0.81, 2.24]
Quartile 4	0.26*	0.69	2.04*	1.92*	3.37*	2.63*	1.92*	2.16*
	[0.21, 0.60]	[0.39, 1.20]	[1.27, 3.26]	[1.15, 3.22]	[1.87, 6.08]	[1.39, 4.95]	[1.20, 3.08]	[1.32, 3.53]
Parental education								
Less than high school (ref.)	—	—	—	—	—	—	—	—
Completed high school	1.20	1.46	1.36	1.32	1.40	1.35	1.39	1.45
	[0.71, 2.04]	[0.82, 2.62]	[0.86, 2.15]	[0.82, 2.11]	[0.74, 2.64]	[0.73, 2.52]	[0.81, 2.36]	[0.84, 2.48]
Some postsecondary	0.66	1.02	1.17	1.12	1.10	0.91	1.03	1.14
	[0.39, 1.13]	[0.58, 1.80]	[0.74, 1.85]	[0.68, 1.82]	[0.60, 2.03]	[0.50, 1.65]	[0.59, 1.79]	[0.65, 2.01]
Completed college	0.38*	0.82	1.88*	1.74 [†]	1.88*	1.35	1.34	1.54
	[0.21, 0.69]	[0.42, 1.61]	[1.12, 3.16]	[0.98, 3.10]	[1.03, 3.41]	[0.71, 2.55]	[0.78, 2.31]	[0.85, 2.80]
Some postgraduate	0.20*	0.52	3.25*	3.13*	3.36*	2.50*	2.07*	2.57*
	[0.08, 0.51]	[0.20, 1.38]	[1.46, 7.20]	[1.39, 7.07]	[1.62, 6.97]	[1.17, 5.32]	[1.07, 3.98]	[1.25, 5.30]
<i>p</i> value								
Income variables	.000	.575	.003	.009	.023	.476	.012	.004
Wealth variables	.000	.253	.017	.059	.001	.028	.018	.006
Parental education	.000	.110	.013	.028	.002	.030	.130	.078

Notes: Odds ratios and 95% confidence intervals [reported in brackets] are shown, except for *p* value data. Baseline model includes controls for age, race, gender, parents' marital status, parental age, and young adult education, employment, residence, and relationship social role statuses. *P* values are from *F* tests of joint significance of socioeconomic status indicators. Ref. = reference. ^aAt least four drinks (for women) or five drinks (for men) per occasion, 12 or more times per year; ^breference period is the 12 months before the interview.

[†]*p* < .10; **p* < .05.

also significant predictors of heavy episodic drinking. Age was a predictor, with young adults age 23 and older having the highest odds of heavy episodic drinking. White young adults and men were more likely to engage in heavy episodic drinking, as were young adults whose parents were married. The odds of heavy episodic drinking were lower among young adults who lived with their parents or who were currently in a cohabiting relationship. We found similar patterns using 24 or more occasions of heavy episodic drinking per year (approximately bimonthly).

Marijuana

The marijuana results are presented in the fourth panel ("Marijuana use") in Table 3. The odds of marijuana use in the past year were consistently, significantly greater only among respondents in the highest categories across each SES measure. These results remained with the addition of covariates. For marijuana use, significant covariate effects included lower odds of use for those who were non-White,

women, high school graduates (at a trend level), and currently married. We also estimated models using monthly marijuana use. Respondents in the top income quartile (including controls) and those in all higher parental education categories (with and without controls) were significantly more likely to have engaged in this behavior relative to respondents from low-income backgrounds and families headed by high school dropouts, respectively. The covariate effects were largely similar to those generated by the yearly use model.

Additional analyses

Previous research has demonstrated different patterns of substance use for men and women. We tested whether these differences also held with respect to SES by interacting the female dummy variable with the SES indicators. We found no significant differences with respect to current smoking and monthly heavy episodic drinking. However, with respect to current drinking and monthly marijuana use, we found

TABLE 4. Covariate and control effects in logistic regressions

Variable	Current smoking	Current drinking	Heavy episodic drinking ^a	Marijuana use ^b
Age (ref.: 17–18 years)				
19–20 years	1.17 [0.81, 1.67]	1.90* [1.43, 2.54]	2.30* [1.57, 3.37]	1.16 [0.85, 1.59]
21–22 years	1.26 [0.74, 2.14]	4.41* [2.73, 7.12]	3.22* [1.81, 5.73]	1.39 [0.84, 2.31]
≥23 years	0.75 [0.25, 2.30]	2.13† [0.90, 5.03]	7.90* [2.92, 21.38]	2.35 [0.81, 6.81]
Non-White (ref.: White)	0.32* [0.21, 0.49]	0.43* [0.30, 0.60]	0.19* [0.11, 0.32]	0.47* [0.32, 0.71]
Female (ref.: male)	0.69* [0.47, 0.99]	0.58* [0.43, 0.79]	0.53* [0.37, 0.76]	0.57* [0.40, 0.79]
Family background				
Parents married in 1997 (ref.: unmarried)	1.00 [0.65, 1.53]	1.26 [0.89, 1.77]	2.10* [1.29, 3.42]	1.37 [0.92, 2.02]
Parental age in 1997 (ref.: <age 36)				
36–49 years	0.86 [0.57, 1.30]	1.31 [0.91, 1.87]	0.93 [0.59, 1.46]	1.10 [0.74, 1.63]
≥50 years	1.44 [0.62, 3.35]	0.95 [0.53, 1.70]	0.73 [0.33, 1.63]	1.42 [0.73, 2.78]
High school graduate (ref.: nongraduates)	0.27* [0.16, 0.46]	1.06 [0.62, 1.82]	1.10 [0.52, 2.34]	0.65† [0.40, 1.06]
Educational and working status (ref.: not working or in school)				
Working only	0.83 [0.55, 1.25]	1.21 [0.79, 1.84]	1.08 [0.57, 2.04]	0.99 [0.64, 1.54]
Student	0.32* [0.20, 0.50]	0.96 [0.63, 1.47]	1.26 [0.66, 2.42]	0.68 [0.42, 1.08]
Residence and relationship status				
Lives with parents (ref.: lives on own)	0.84 [0.58, 1.21]	0.76 [0.54, 1.06]	0.63* [0.43, 0.92]	0.93 [0.66, 1.31]
Married (ref.: neither married nor cohabiting)	0.74 [0.31, 1.77]	0.54† [0.26, 1.10]	0.41 [0.12, 1.41]	0.26* [0.09, 0.74]
Cohabiting (ref.: neither married nor cohabiting)	1.77* [1.07, 2.93]	0.91 [0.56, 1.49]	0.56* [0.32, 0.98]	1.04 [0.64, 1.68]
Ever been pregnant/fathered a child (ref.: never pregnant/fathered)	1.57† [0.93, 2.65]	0.72 [0.45, 1.16]	0.68 [0.32, 1.46]	0.66 [0.38, 1.15]
Year 2005 (ref.: Year 2007)	1.00 [0.74, 1.37]	1.41* [1.07, 1.85]	2.07* [1.45, 2.97]	1.35* [1.03, 1.77]
Constant	2.61* [1.12, 6.06]	1.41 [0.63, 3.13]	0.13* [0.05, 0.34]	0.72 [0.31, 1.64]
Pseudo R ²	.1444	.0969	.1474	.0605
Sample size, <i>n</i>	1,853	1,853	1,853	1,853

Notes: Odds ratios and 95% confidence intervals [reported in brackets] are shown. Ref. = reference. ^aAt least four drinks (for females) or five drinks (for males) per occasion, 12 or more times per year; ^breference period is the 12 months before the interview.

†*p* < .10; **p* < .05.

that women from middle-wealth families had significantly higher odds of these behaviors; there were no interactions with income or parental education.

We created an aggregate measure by summing across each of the three SES constructs. For this summary measure, we combined the high school completion and some postsecondary education categories. This gave us three SES constructs, each with four categories. As a result, the indicators generated by the sum and average have intuitive meaning. This variable ranged from 3 (low SES [value of 1] in education, income, and wealth) to 12 (high SES [value of

4] in all three constructs). We then created dummy variables for each possible value. Twenty percent of all respondents were in the bottom two categories, compared with 15% in the top two. The modal value was 4, which translates to low SES in two categories and second lowest in the third. This wider distribution of categories allowed us to investigate whether the relationship between substance use and SES was concentrated among respondents who were high on all measures and provided an opportunity to observe more subtle nonlinearities. Using this set of indicators, the odds of smoking declined as the aggregated value increased, although only

categories 2–4 were statistically significantly different from the bottom category. In contrast, the odds of drinking, heavy episodic drinking, and marijuana use were orders of magnitude higher among respondents in the top two categories, which suggests that much of the effect was driven by those in the highest SES categories across measures.

Discussion

The period between adolescence and adulthood represents a crucial developmental transition when initial plans meet the realities and opportunities of post-high school experiences. Substance use is common during this period, and attention to risk and protective factors associated with young adult substance use continues to be needed (e.g., Carter et al., 2010; Schulenberg and Maggs, 2002). Experiences during this transition are clearly structured by SES (e.g., Conger et al., 2010; Settersten et al., 2005). Consistent with other research, this study found that family SES is associated with substance use.

In general, we saw a convergence across the three indicators of SES—income, wealth, and parental education—in terms of the associations with various types of substance use. The consistency of the findings helps bring some needed clarity to the understanding of how family background SES relates to substance use during late adolescence and early adulthood. The general concurrence across the three SES measures suggests that using just one measure (e.g., when limited by survey design) may be generally sufficient to capture the SES–substance use linkages. However, the exact functional relationship between SES and substance use differs across the three SES indicators; information about each SES indicator allows researchers to better identify young adults at risk. For example, because wealth is the strongest predictor of heavy episodic drinking, sole reliance on a different SES measure such as young adult self-report of parental education may miss important nuances in the associations between SES and alcohol use behaviors.

We found broad support for existing studies that show smoking to be more prevalent among individuals from lower SES households (Centers for Disease Control and Prevention, 2008; Goodman and Huang, 2002; Hanson and Chen, 2007; Schoenborn and Adams, 2010). However, this association was explained by the addition of covariates. In addition, we found suggestive evidence of a positive association between current smoking and childhood SES among young adults from the poorest 20%–30% of the income and wealth distributions. This was also evident for respondents whose parents were high school dropouts compared with those whose parents finished high school. Because of a lack of statistical power, these patterns were not significant in our sample but do warrant additional attention.

Our findings support previous research that has shown affluent children to be at greater risk for current alcohol use,

frequent heavy episodic drinking, and marijuana use during the transition to adulthood (Luthar, 2003; Luthar and Latendresse, 2005; Martin and Pritchard, 1991; Schoenborn and Adams, 2010). In fact, individuals in the highest SES groups (i.e., highest income and wealth quartiles, parents with post-graduate training) showed the strongest and most consistent effects. These risks and their associations with family SES had not yet been examined in both a national sample and a sample targeting the specifically vulnerable period of young adulthood. We recommend interpreting wealth- and income-related findings in light of other evidence suggesting that health outcomes are associated with the relative position of an individual in the SES distribution (i.e., the perceived social status) rather than the absolute amount of available money (Wilkinson, 1997). In addition, certain contexts more likely to be accessible for young adults from relatively higher family SES backgrounds, such as universities, are especially supportive of excessive alcohol and marijuana use (Schulenberg and Maggs, 2002).

Research on neighborhood effects has yielded compelling related findings on substance use. For example, in the Moving to Opportunity study, adolescents in families who were given housing vouchers enabling them to move out of areas of poverty evidenced different patterns of substance use. For girls, moving to higher SES areas was associated with lower alcohol and marijuana use; for boys, the same move was associated with higher alcohol and marijuana use (Kling et al., 2007). Affluent neighborhoods may contribute to higher levels of substance use because in these areas there is less supervision of children and more exposure to substance-using peers (Trim and Chassin, 2008). However, the experience of a sudden change in neighborhood context and its effects on substance use may differ greatly from the experience of being raised in a family with a more stable socioeconomic environment. Wealth may serve as a proxy for neighborhood effects, given that home ownership is the most common form and repository of wealth (Conley, 1999; Gouskova and Stafford, 2007).

Although this study focused on childhood SES, a related literature assesses the SES of young adults themselves. Available studies have documented that higher occupation status among adults is associated with more alcohol and substance use disorders (Diala et al., 2004; Wohlfarth and Van den Brink, 1998), and higher income predicts more frequent drinking and less smoking (Schoenborn and Adams, 2010). However, SES is difficult to measure accurately for those who are still moving toward adult-level income, wealth, and education. As the period between high school graduation and career attainment has elongated, consistent SES estimation has become an emerging issue for researchers. Limitations of our work include not having available measures of current young adult SES, parental or family history of substance use, or neighborhood context.

Our purpose was to examine how the socioeconomic

environment in which young adults were raised as children predicts their behavior in young adulthood. Understanding this relationship, especially to predict substance use during the peak substance-using years, is an important step in identifying individuals at risk. Children and adolescents are common targets for prevention programs focused on substance use (Tobler et al., 2000); therefore, understanding which contexts confer the greatest risks is important for designing effective programs. The findings confirm trends increasingly documented in empirical research that youth from lower SES families are more likely to smoke, suggesting that lower SES communities may be more likely to see long-term benefits from smoking-prevention programs. Youth from affluent families appear to be especially prone to alcohol use, heavy episodic drinking, and marijuana use, suggesting that high-SES communities should acknowledge these risks and address the particular need for programs that help prevent alcohol and marijuana use. However, affluent youth may not suffer the same social, health, and economic consequences of their higher levels of alcohol and marijuana use that lower SES youth would because of a buffering effect from their available resources. Luthar and Goldstein (2008) suggest that higher substance use in high-SES communities is, in part, attributable to permissive parental attitudes and inconsistently enforced consequences; thus, interventions that engage parents and encourage them to set clear rules and consequences surrounding substance use by adolescents might prove effective. Further research should explore not only levels of substance use but also experienced consequences, including symptoms of substance use disorders later in life. Multiple measures of SES add to our understanding of the complex associations, although additional work must identify and describe the mechanisms by which childhood SES influences young adult substance use. A fruitful next step may be to determine the extent to which substance use attitudes, modeling, and perceived social norms mediate the effects of SES on substance use behaviors in young adulthood.

References

- Carter, A. C., Brandon, K. O., & Goldman, M. S. (2010). The college and noncollege experience: A review of the factors that influence drinking behavior in young adulthood. *Journal of Studies on Alcohol and Drugs, 71*, 742–750.
- Centers for Disease Control and Prevention. (2008). Cigarette smoking among adults—United States, 2007. *Morbidity and Mortality Weekly Report, 57*, 1221–1226. Retrieved from <http://www.cdc.gov/mmwr/preview/mmwrhtml/mmm5745a2.htm>
- Chassin, L., Hussong, A., & Beltran, I. (2009). Adolescent substance use. In R. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (Vol. 1, pp. 723–763). Hoboken, NJ: Wiley.
- Conger, R. D., Conger, K. J., & Martin, M. J. (2010). Socioeconomic status, family processes, and individual development. *Journal of Marriage and the Family, 72*, 685–704.
- Conley, D. (1999). *Being Black, living in the read: Race, wealth, and social policy in America*. Berkeley, CA: University of California Press.
- Davis-Kean, P. E. (2005). The influence of parent education and family income on child achievement: The indirect role of parental expectations and the home environment. *Journal of Family Psychology, 19*, 294–304.
- Diala, C. C., Muntaner, C., & Walrath, C. (2004). Gender, occupational, and socioeconomic correlates of alcohol and drug abuse among U.S. rural, metropolitan, and urban residents. *American Journal of Drug and Alcohol Abuse, 30*, 409–428.
- Díaz-Giménez, J., Quadrini, V., & Ríos-Rull, J.-V. (1997). Dimensions of inequality: Facts on the U.S. distributions of earnings, income and wealth. *Federal Reserve Bank of Minneapolis Quarterly Review, 21*(2), 3–21.
- Duncan, G., & Brooks-Gunn, J. (1999). *Consequences of growing up poor*. New York, NY: Russell Sage Foundation.
- Fitzgerald, J., Gottschalk, P., & Moffitt, R. (1998). An analysis of the impact of sample attrition on the second generation of respondents in the Michigan Panel Study of Income Dynamics. *The Journal of Human Resources, 33*, 300–344.
- Goodman, E., & Huang, B. (2002). Socioeconomic status, depressive symptoms, and adolescent substance use. *Archives of Pediatrics & Adolescent Medicine, 156*, 448–453.
- Gouskova, E., & Stafford, F. (2007). Trends in household wealth dynamics, 2003–2005. *Panel Study of Income Dynamics Technical Series Paper #07-07*. Ann Arbor, MI: Survey Research Center—Institute for Social Research, University of Michigan. Retrieved from http://psidonline.isr.umich.edu/Publications/Papers/tsp/2007-07_Trends_in_Household_Wealth.pdf
- Hanson, M. D., & Chen, E. (2007). Socioeconomic status and health behaviors in adolescence: A review of the literature. *Journal of Behavioral Medicine, 30*, 263–285.
- Harwood, H. (2000). *Updating estimates of the economic costs of alcohol abuse in the United States: Estimates, update methods, and data*. Report prepared by The Lewin Group for the National Institute on Alcohol Abuse and Alcoholism, 2000. Based on estimates, analyses, and data reported in Harwood, H.; Fountain, D.; and Livermore, G. *The economic costs of alcohol and drug abuse in the United States 1992*. Report prepared for the National Institute on Drug Abuse and the National Institute on Alcohol Abuse and Alcoholism, National Institutes of Health, Department of Health and Human Services. NIH Publication No. 98-4327. Rockville, MD: National Institutes of Health, 1998. Retrieved from <http://pubs.niaaa.nih.gov/publications/economic-2000/alcoholcost.PDF>
- Hofferth, S., Davis-Kean, P. E., Davis, J., & Finkelstein, J. (1999). *The child development supplement to the Panel Study of Income Dynamics: 1997 User Guide*. Ann Arbor, MI: Survey Research Center, Institute for Social Research, The University of Michigan. Retrieved from https://psidonline.isr.umich.edu/CDS/cdsi_userGD.pdf
- Huckle, T., You, R. Q., & Casswell, S. (2010). Socio-economic status predicts drinking patterns but not alcohol-related consequences independently. *Addiction, 105*, 1192–1202.
- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2011). *Monitoring the Future national survey results on drug use, 1975–2010. Volume II: College students and adults ages 19–50*. Ann Arbor, MI: Institute for Social Research, The University of Michigan.
- Kling, J. R., Liebman, J. B., & Katz, L. F. (2007). Experimental analysis of neighborhood effects. *Econometrica: Journal of the Econometric Society, 75*, 83–119.
- Lowry, R., Kann, L., Collins, J. L., & Kolbe, L. J. (1996). The effect of socioeconomic status on chronic disease risk behaviors among US adolescents. *Journal of the American Medical Association, 276*, 792–797.
- Luthar, S. S. (2003). The culture of affluence: Psychological costs of material wealth. *Child Development, 74*, 1581–1593.
- Luthar, S. S., & Goldstein, A. S. (2008). Substance use and related behaviors among suburban late adolescents: The importance of perceived parent containment. *Development and Psychopathology, 20*, 591–614.

- Luthar, S. S., & Latendresse, S. J. (2005). Children of the affluent: Challenges to well-being. *Current Directions in Psychological Science, 14*, 49–53.
- Martin, M. J., & Pritchard, M. E. (1991). Factors associated with alcohol use in later adolescence. *Journal of Studies on Alcohol, 52*, 5–9.
- Office of National Drug Control Policy. (2004). *The economic costs of drug abuse in the United States, 1992–2002* (Publication No. 207303). Washington, DC: Executive Office of the President.
- Panel Study of Income Dynamics. (2011). *Public use dataset*. Produced and distributed by the Institute for Social Research. Ann Arbor, MI: Survey Research Center, University of Michigan.
- Park, M. J., Paul Mulye, T., Adams, S. H., Brindis, C. D., & Irwin, C. E., Jr. (2006). The health status of young adults in the United States. *Journal of Adolescent Health, 39*, 305–317.
- Rice, D. P. (1999). Economic costs of substance abuse, 1995. *Proceedings of the Association of American Physicians, 111*, 119–125.
- Schoenborn, C. A., & Adams, P. F. (2010). Health behaviors of adults: United States, 2005–2007. *Vital and Health Statistics, 10(245)*. Hyattsville, MD: National Center for Health Statistics. Retrieved from http://www.cdc.gov/nchs/data/series/sr_10/sr10_245.pdf
- Schulenberg, J. E., & Maggs, J. L. (2002). A developmental perspective on alcohol use and heavy drinking during adolescence and the transition to young adulthood. *Journal of Studies on Alcohol, Supplement 14*, 54–70.
- Settersten, R. A., Jr., Furstenberg, F. F., Jr., & Rumbaut, R. G. (Eds.). (2005). *On the frontier of adulthood: Theory, research, and public policy*. Chicago, IL: University of Chicago Press.
- Tobler, N. S., Roona, M. R., Ochshorn, P., Marshall, D. G., Streke, A. V., & Stackpole, K. M. (2000). School-based adolescent drug prevention programs: 1998 meta-analysis. *The Journal of Primary Prevention, 20*, 275–336.
- Trim, R. S., & Chassin, L. (2008). Neighborhood socioeconomic status effects on adolescent alcohol outcomes using growth models: Exploring the role of parental alcoholism. *Journal of Studies on Alcohol and Drugs, 69*, 639–648.
- Wilkinson, R. G. (1997). Socioeconomic determinants of health: Health inequalities: Relative or absolute material standards? *British Medical Journal, 314*, 591–595.
- Wohlfarth, T., & Van den Brink, W. (1998). Social class and substance use disorders: The value of social class as distinct from socioeconomic status. *Social Science & Medicine, 47*, 51–58.