Sociological Spectrum, 32: 20–36, 2012

ISSN: 0273-2173 print/1521-0707 online
DOI: 10.1080/02732173.2012.628553

Routledge
Taylor & Francis Group

GENDER, RACE/ETHNICITY, AND DEVIANT DRINKING: A LONGITUDINAL APPLICATION OF SOCIAL STRUCTURE AND SOCIAL LEARNING THEORY

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Aker's (1998) theory of social structure and social learning (SSSL) argues that structural variations in deviant behavior, such as gender or racelethnic differences in underage or heavy drinking, are mediated by social learning variables. However, longitudinal analyses of deviant drinking in an urban sample of white, black, and Hispanic adolescents fail to support the SSSL mediation hypothesis. Significant gender and racelethnic differences persist after controls for social learning variables as well as for social bonding variables. Interaction effects involving two social bonding variables—family attachment and moral belief—point to theoretically important conditions that maintain a gender gap in underage drinking and relatively low levels of deviant drinking among African American adolescents.

Some of the strongest and most consistent patterns in epidemiological research on adolescent alcohol use involve gender and race/ethnic differences. Young men tend to drink more frequently, in heavier quantities, and with more problematic consequences than do young women (Johnston et al. 2007; Office of the Surgeon General 2007; Wallace et al. 2003). Similarly, white adolescents in the United States are more frequent and heavier users of alcohol than are Hispanic, African American, or Asian teenagers (Johnston et al. 2007; Oetting and Beauvais 1990; Wallace and Bachman 1991; Wallace et al. 2002). These differences are theoretically interesting as well as substantively important, because, in each case, the prevalence of deviant drinking is higher among adolescents in traditionally more privileged social statuses. Surprisingly, relatively few efforts have been made to explore broader implications of these patterns of norm-violating activity by examining their bearing on general theories of deviance.

We attempt to move toward a clearer theoretical understanding of gender and race/ethnic differences in deviant drinking by examining how social learning and social bonding processes affect patterns of alcohol use in adolescence and early adulthood. Theories of social learning or differential association posit that social

We are grateful for the advice and assistance of Jay Turner, Richard Wilsnack, Don Lloyd, and John Reynolds.

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interaction with peers, family, and other primary groups is the principal source of subjective definitions and behavioral techniques that promote deviant activity such as heavy or underage drinking (Akers 1998; Sutherland 1947). On the other hand, social bonding or control theory argues that deviant behavior tends to occur when adolescents' bonds to family, school, and other conventional relationships and institutions are weak or absent (Hirschi 1969; Marcos et al. 1986). These two theoretical perspectives have widely been applied to adolescent delinquency and substance use, but evidence of their ability to account for gender and race/ethnic differences in deviant drinking is limited (Lee et al. 2004; Liu and Kaplan 1999; Wallace and Bachman 1991).

Our analysis builds on the recent efforts of Akers and his associates to develop and test a theory of social structure and social learning (SSSL) that can explain gender, race/ethnic, and other structural patterns of deviant behavior (Akers 1998, 1999; Akers and Lee 1999; Lee et al. 2004). In particular, this study examines what we term the SSSL *mediation hypothesis*: that social learning variables such as differential association and normative definitions account for most, if not all, of the variation in deviant drinking by gender and race/ethnicity (see Akers 1998, pp. 340–341). We use multivariate techniques to determine whether controls for social learning variables eliminate or markedly reduce gender and race/ethnic differences in underage drinking and heavy alcohol use. We also examine a second implication of SSSL theory—the *generality hypothesis*—by testing for statistical interactions between social learning variables and the structural variables, gender and race/ethnicity (cf. Tittle et al. 2003). If Akers' (1998; also see Krohn et al. 1984) claims about the generality of social learning mechanisms are valid, then we should find that the ''main effects'' of social learning variables on deviant drinking are similar for men and women and across various race/ethnic groups. On the other hand, as some of Akers' own research on alcohol and marijuana use suggests (Krohn et al. 1984; Lee et al. 2004), evidence of interaction effects would indicate that learning mechanisms operate differently for adolescents in particular structural locations. Finally, we assess Akers and Lee's (1999) *comparative hypothesis* that the mediating effects of social learning variables will be stronger than those of social bonding variables. We include measures of conventional attachments, commitments, and moral beliefs based on social bonding theory (Hirschi 1969; Marcos et al. 1986) to determine whether these elements of the social bond better account for longitudinal relationships between gender, race/ethnicity and deviant drinking than do differential associations and definitions favorable to alcohol use.

Using longitudinal data from a racially- and ethnically-diverse sample of over a thousand adolescents in Miami-Dade County, Florida (Gil et al. 2002; Warheit et al. 1995), we examine the effects of social learning and bonding variables measured prior to high school on alcohol use among young men and women during their post–high school years. In contrast to previous assessments of the SSSL model that used cross-sectional data (Akers 1998; Lee et al. 2004), the data we use allow us to establish a clear time order between potential mediating or moderating variables (such as friends' alcohol use) and respondents' drinking behavior four or five years later. Also, this data set permits comparison of Cuban American drinking patterns to those of other Hispanic groups in the Miami-Dade area as well as to those of white non-Hispanics and African Americans. Recent epidemiological evidence

indicates that Cuban American youths have the highest rate of underage or heavy drinking of any Hispanic American group (Delva et al. 2005; Wallace et al. 2002).

GENDER, RACE/ETHNICITY, AND ADOLESCENT ALCOHOL USE

Reports from the Monitoring the Future (MTF) project continue to show that the prevalence of deviant drinking among adolescents in the United States varies significantly by gender and race/ethnicity (Johnston et al. 2007; Wallace et al. 2002, 2003). Although the gender gap in alcohol use among high school seniors has narrowed since the 1970s, 12th grade boys still exceed girls in the 30-day prevalence of alcohol use, heavy drinking (5+ drinks within the past two weeks), and having been drunk (O'Malley et al. 1998; Wallace et al. 2003). With regard to race/ethnicity, white students exceed most other groups of seniors in the annual and 30-day prevalence of alcohol use and on measures of heavy or frequent drinking, with the notable exceptions of Native American and Cuban American seniors (Wallace et al. 2002, 2003). Based on pooled data from the 1996–2000 MTF surveys for groups represented in our study, Wallace and colleagues (2002, p. S71) report that the 30-day prevalence rate of alcohol use among Cuban American seniors (56.8%) is virtually identical to the rate for white seniors (56.1%), both of which are substantially higher than the rates for African Americans (32.5%) and other Latin Americans (47.5%). Their data on rates of heavy drinking (2002, p. S72) show a similar pattern, with whites (35.1%) and Cuban Americans (30.0%) being considerably more likely to have consumed five or more drinks in a row within the past two weeks than African Americans (12.4%) and other Latin Americans (25.8%).

There have been few efforts to explain these persistent variations in underage and heavy drinking among adolescents. Wallace and Bachman (1991, p. 334) used MTF data to determine whether "the often large racial/ethnic differences in drug [and heavy alcohol] use may be attributable to racial/ethnic differences in background and in other important lifestyle factors." Because they did not include or control for "proximal" social learning variables such as peers' drug/alcohol use or respondents' attitudes, Wallace and Bachman's study does not constitute an adequate test of the SSSL mediation hypothesis. However, using pooled MTF data on high school seniors from 1985–1989, they did find that "distal" lifestyle variables reflecting educational commitment (e.g., grades, truancy) and religiosity (church attendance, importance of religion) were significantly related to heavy drinking (5+ drinks in the past two weeks). Controls for these lifestyle variables and background variables in multiple regression equations reduced, but did not eliminate the gap between white students' rates of heavy drinking and the lower rates for African American and non-Mexican Hispanic students. Although Wallace and Bachman did not formally compare their separate regression analyses by gender, the patterning of significant lifestyle and background predictors was quite similar for boys and girls, even though boys were generally more likely to drink heavily.

In an analysis designed specifically to assess the SSSL framework, Lee et al. (2004) found that three social learning variables—differential association, definitions, and differential reinforcement—mediated the effects of several structural variables (e.g., age, family structure, community size) on alcohol use in a sample of adolescents that were surveyed in the 1970s for the Boys Town project (Akers

et al. 1979). However, the effects of gender on underage drinking remained significant after controls for social learning variables, leading Lee et al. (2004, p. 30) to speculate that "social learning may not mediate as much as it moderates . . . the gender ratio." Nonetheless, they did not address this point empirically by examining whether gender interacted with other variables in the SSSL model. Furthermore, given that the Boys Town sample included few non-white students, Lee and colleagues (2004, p. 30) indicated that future "research should more adequately address the question of whether differences . . . by race are mediated by differences in exposure to social learning experiences."

Watt and Rogers (2007) present evidence bearing on this question in a cross-sectional analysis of race (white versus black) differences in underage drinking among adolescents in the nationally representative Add Health Survey.[1] White males and females were significantly more likely to drink than their black counterparts, and this race difference was unaffected by controls for a large set of neighborhood, family, and peer-related factors. Furthermore, Watt and Rogers found several significant interactions involving race and other predictors of underage drinking, including an interaction indicating that white women were more strongly influenced by friends' alcohol use than were black women. Thus, results from this study are inconsistent with both the SSSL mediation hypothesis and the generality hypothesis.

However, the results of an investigation of "binge drinking" among college students by Durkin and colleagues (2005) are more in line with Akers' SSSL framework. These researchers found that controls for several social learning variables in multivariate analyses markedly reduced significant bivariate effects of gender and race (white versus "other") on binge drinking, although the net effect of race remained statistically significant. Durkin and colleagues did not design their study as a test of the SSSL model, and the cross-sectional nature of their data limits inferences that can be drawn about support for Akers' theory. Yet, their results suggest that differences in conditions of social learning may explain most of the variation in deviant drinking by gender and race/ethnicity among young people. In sum, the evidence from previous cross-sectional studies of deviant drinking offers mixed support for the SSSL mediation hypothesis. We now turn to our longitudinal examination of this and other implications of the SSSL model.

Our assessment of the SSSL mediation, generality, and comparative hypotheses proceeds in three stages involving three different measures of deviant drinking. First, after describing our sample and measures, we present a logistic regression analysis of *underage drinking* among respondents who are below the age of 21. Here, we examine whether variations in social learning and/or social bonding in mid-adolescence can account for subsequent gender and race/ethnic differences in the onset of underage drinking. Second, focusing on current drinkers in our sample, we use OLS regression to see if patterns of heavy and frequent alcohol use, as measured by a *quantity-frequency (Q-F) scale*, can be adequately explained by SSSL theory. Third, we examine a stronger indicator of deviant drinking in a logistic regression analysis of how social learning and social bonding variables affect the

[1]Unlike Monitoring the Future and other national surveys, the Add Health data analyzed by Watt and Rogers (2007) do not show significant race differences in heavy drinking or in the 30-day prevalence of illegal drug use.

likelihood that drinkers from different gender and race/ethnic groups will meet the *DSM-IV criteria for alcohol abuse* (see Wagner et al. 2002).

METHODS

Sample

Our data come from a four-wave longitudinal survey of Cuban-Hispanic, non-Cuban Hispanic, African American, and white males and females in Miami-Dade County, Florida.[2] The data for the first three waves were collected annually starting in 1990 from a panel of students who initially ranged in age from 10 to 14 years. Male panel members were selected from the population of 9,763 sixth- and seventh-grade boys who were students in Miami-Dade County's 48 middle schools. Female panel members were drawn from a population of 669 girls who attended sixth and seventh grades in six of the 48 middle schools. Of students eligible for participation in the study, 7,386 completed the wave 1 survey. Total attrition between waves 1 and 3 was 19.79 percent, yielding a sample of 5,924 adolescents for the wave 3 survey in 1993. In the first three waves, study project staff administered questionnaires to respondents in classrooms.

The sample for the wave 4 survey in 1998–2000 included 410 female members of the original panel and 1,273 young men who were randomly selected from the male participants in wave 3. Trained interviewers completed face-to-face interviews in the respondents' homes or in project research offices with 76.4% of these young adults. Our measures come from a final sample of 1266 young adults who had valid responses for both gender and race/ethnicity in waves 3 and 4.

The sample was stratified by race/ethnicity, which allows us to study differences in alcohol use by national origin within the large Hispanic population in south Florida. Four race/ethnic groups comprise nearly equal proportions of the sample: non-Hispanic whites (29.0%), African Americans (27.4%), Cuban-Hispanics (23.3%), and other Hispanics (20.3%). Men comprised 74.4% of this sample, and 91.8% of respondents in wave 4 were between 19–21 years of age (range 18–23).

Dependent Variables

We measure our three dependent variables—*Underage Drinking*, quantity and frequency of alcohol use (*Q-F scale*), and DSM-IV *Alcohol Abuse*—with data from young adults in the fourth wave of the study. The first two measures are based on a series of questions about the quantity and frequency of alcohol use over the prior year. The respondents were asked about the largest number of drinks they had in the past 12 months in a single day; the categories are: 20 or more drinks, 10–19 drinks, 5–9 drinks, 3–4 drinks, or 1–2 drinks. Depending on the number of drinks specified in the first question, respondents were then asked how often they consumed the high-

[2]See Gil and colleagues (2002) for details on sampling and survey administration. Gil and colleagues report that there were no statistically significant differences in 28 behaviors and family factors between wave 3 respondents who did not complete the wave 4 survey versus those who did. Also, the high school drop-out rate among young adults in the wave 4 sample is similar to that of the population of students in the Miami-Dade public school system.

Table 1 Means (*n*) for measures of deviant drinking by gender and race/ethnicity

	Underage drinking (under 21 only)[a,b]		Q-F scale (drinkers only)[b]		Alcohol abuse (drinkers only)[c]	
	Men	Women	Men	Women	Men	Women
Non-Hispanic White	0.77 (209)	0.75 (83)	3.69 (204)	3.55 (80)	0.38 (204)	0.30 (80)
African American	0.40 (167)	0.22 (81)	2.91 (98)	3.09 (23)	0.19 (98)	0.13 (23)
Cuban Hispanic	0.71 (195)	0.46 (56)	3.21 (163)	3.00 (31)	0.34 (163)	0.26 (31)
Other Hispanic	0.64 (153)	0.46 (39)	3.32 (139)	2.68 (22)	0.35 (139)	0.23 (22)

Note. Means are followed by subsets of the sample in parentheses (*n*).
[a]Main effect of gender significant at $p < .01$.
[b]Main effect of race/ethnicity significant at $p < .01$.
[c]Main effect of race/ethnicity significant at $p < .05$.

est number of drinks, followed by questions asking about consumption of a lower number of drinks across the categories of decreasing quantity. We derived the following six quantity-frequency categories from these items: 0 = non-drinkers (never had at least 12 drinks in any 12-month period of their lives or who had no drinks in the past 12 months), 1 = low-infrequent (1–2 drinks less often than once per month), 2 = low-weekly (1–2 drinks once per month to two times per week), 3 = high-infrequent (3 or more drinks less often than once per month), 4 = high-weekly (3 or more drinks once per month to two times per week), and 5 = frequent (drinks three times per week or more often).[3]

For our analyses of Underage Drinking, we dichotomize the above categories into 0 = Nondrinkers versus 1 = Drinkers (categories 1–5 combined), and restrict the sample to respondents who were under the age of 21 at wave 4. On the other hand, our analyses of the Q-F scale exclude non-drinkers (category 0) and treat the five categories of drinkers as a quasi-interval scale ranging from 1 to 5. We do not impose any age restrictions on the latter analyses. See Table 1 for descriptive statistics on these and the following dependent variables.

Finally, our analyses of Alcohol Abuse are based on items adapted from the Composite International Diagnostic Interview (Wagner et al. 2002). Based on DSM-IV criteria (American Psychiatric Association 1994), respondents are scored 1 for Alcohol Abuse (otherwise 0) if they respond affirmatively to any of the following: failure to meet important role obligations at work, school, or home due to alcohol use; continued use despite risk of injury due to the effects of alcohol; recurrent alcohol-related legal problems; and recurrent problems with family, friends, or work due to alcohol use. We use scores for annual (past year) prevalence of Alcohol Abuse, including any respondents who also meet the DSM-IV criteria for Alcohol Dependence.

[3]Although a few frequent drinkers drink one to two drinks three or more times a week, the vast majority drinks three or more per occasion. The distribution of wave 4 respondents across these six quantity frequency categories is as follows: 39.9% non-drinkers, 9.3% low-infrequent drinkers, 6.8% low-weekly drinkers, 12.9% high-infrequent drinkers, 16.8% high-weekly drinkers, and 14.2% are frequent drinkers.

Independent Variables

Gender is coded 1 for men and 0 for women. *Race/ethnicity* is dummy-coded into three variables—non-Hispanic White, Cuban, and Other Hispanic—with African American as the reference category. We use *Parental Socioeconomic Status* (SES) as a control variable. This is a composite measure of parental income level, educational attainment, and occupational prestige. Most of the data on parental SES were obtained from parent interviews, but these interview data were supplemented with information from the young adult respondents where needed. This SES measure was constructed by standardizing and summing each of the three components and dividing by the number of status dimensions for which there were data (minimum = −2.30; maximum = 2.17; mean = .12). An advantage of using SES from the family of origin is that causal direction between SES and alcohol use is clear. *Prior Drinking at Wave 3* (eighth/ninth grade), which we use as a control variable in some analyses, is based on the number of different days on which the respondent had beer, wine, or liquor to drink during the 12 months preceding wave 3 data collection, excluding drinking for religious reasons (0 = zero to 6 = 40 or more; mean = 1.02).

Our measures of two key variables in SSSL theory (Akers 1998) come from the wave 3 data. *Differential Association* is an additive scale based on three questions: "How many of your close friends do you think drink alcohol?"; "How do you think your close friends would feel about people who drink alcohol?"; and "How would your parents feel if they thought your friends drink alcohol?" This scale ranges from 1 (*unfavorable to alcohol use*) to 4 (*favorable to alcohol use*), with a mean of 1.75 and an alpha of .67. We use a single item to measure respondents' positive or negative *Definition of Alcohol Use*: "How harmful do you think it would be for you if you drank beer, wine, or liquor (alcohol)?" (1 = not harmful at all to 4 = very harmful; mean = 3.1).

To assess the comparative hypothesis, we employ three additive scales based on wave 3 data to represent major elements in Hirschi's (1969) social bonding theory.[4] *Family Attachment* includes three dimensions as reported by respondents: (1) the degree to which family members like to spend time together; (2) how close the family feels to each other; and (3) the importance of family togetherness. This scale ranges from 1–5, with 5 indicating a high degree of attachment; the mean is 3.45 and the alpha is .83. *School Commitment* consists of three variables which tap respondents' perceptions of the quality of their schoolwork, the importance of getting good grades in school, and the degree to which they would like to quit school (reverse scored). This scale ranges from 0 (negative about school) to 8 (positive about school). The sample mean is 6.72 and the alpha is .56, a low value which points to potential measurement problems for this variable. *Moral Beliefs* is an additive scale derived

[4]In preliminary analyses, we also examined a scale of *Familism*, which is comprised of seven items dealing with family, trust, loyalty, and pride (e.g., "My family shares values and beliefs," "I can express my feelings with my family"). However, this scale did not yield any significant main effects or interactions in equations for our three measures of deviant drinking. Given these negative results and the conceptual overlap of this scale with our measure of Family Attachment, we do not include it in this report. Similar to other research on social bonding theory, our wave 3 data do not include a measure of the temporal bond of "involvement."

from four questions asking respondents whether they think various dishonest acts are acceptable or not (e.g., sneaking into a movie, stealing a bicycle without getting caught). This variable ranges from 1–4 with a mean of 3.26 and an alpha of .72; higher values indicate stronger moral beliefs (i.e., greater condemnation of dishonest acts).

RESULTS

We begin by presenting descriptive findings on gender and race/ethnic differences in our three measures of deviant drinking. Then, we present the results of logistic and OLS regression analyses to determine whether social learning and/or social bonding mechanisms can account for these patterns of drinking behavior. All analyses were conducted with SPSS 15.0 for Windows.[5]

Gender and Race/Ethnic Differences

The comparisons of means in Table 1 show that, for men and especially for women, non-Hispanic white respondents were much more likely to engage in all three forms of deviant drinking than were respondents from the other race/ethnic groups. At the other extreme, African American respondents had the lowest rates of deviant drinking in all comparisons except the Q-F scale for women. The two Hispanic groups occupied the middle ground and had similar scores on all three measures, with the exception of a relatively low Q-F scale score for Other Hispanic women. The effect of race/ethnicity is statistically significant for all three drinking outcomes (based on two-way ANOVAs). Thus, in line with previous epidemiological research, we find a strong and consistent relationship between race/ethnicity and deviant drinking that remains to be explained in our multivariate analyses.

In contrast, we find a significant gender difference only for Underage Drinking, in which African American, Cuban Hispanic, and Other Hispanic men are substantially more likely than women to drink before the age of 21. However, this "gender gap" in Underage Drinking is non-existent among non-Hispanic white respondents, with approximately three-fourths of both men and women engaging in this form of deviant drinking. Elsewhere in Table 1, men generally have higher scores on our outcome measures; yet, neither the Q-F scale nor the measure of Alcohol Abuse shows a statistically significant effect of gender.[6]

[5]We used the SPSS Binary Logistic Regression program to estimate equations for our analyses of Underage Drinking and DSM-IV Alcohol Abuse. The equations for the Q-F scale were estimated with the SPSS Linear Regression program. All analyses employed list-wise deletion of missing data. We used product terms to estimate two-way and three-way interaction effects, retaining those interactions that made a statistically significant improvement ($p < .05$) in the fit of logistic regression equations or variance explained in OLS regression equations.

[6]The two-way interaction effect of gender × race/ethnicity on Underage Drinking was marginally significant at $p = .078$ as was the main effect of gender on Alcohol Abuse at $p = .061$.

Underage Drinking: Multivariate Results

Table 2 reports the results of our logistic regression analysis of Underage Drinking among respondents aged 20 and under. The series of models presented in this and subsequent tables are based on the following five steps in our analyses: (1) a baseline equation including only the main effects of gender and race/ethnicity; (2) an equation adding relevant control variables; (3) an equation including social learning variables to test the mediation hypothesis; (4) an equation including social bonding variables to assess the comparative hypothesis; and, if warranted, (5) equation(s) including statistically significant interaction effects to examine the generality hypothesis. In the case of Underage Drinking, the findings for Models 1 and 2 reinforce the results of our descriptive analysis and show that a control for parental SES does not substantially diminish the significant effects of gender and race/ethnicity. More important theoretically, the results in Model 3 do not support the SSSL mediation hypothesis. Although Differential Association with friends and family and negative Definitions of Alcohol Use are both significantly related to Underage Drinking, the inclusion of these variables in Model 3 has virtually no effect on the magnitude or statistical significance of the coefficients for gender and race/ethnicity. Net of the effects of the social learning variables and SES, men are still twice as likely as women to engage in Underage Drinking. Moreover, the net rate of Underage Drinking is more than four times higher among white non-Hispanic respondents than among African American respondents. Similarly, the net rate of Underage Drinking is significantly higher among the two Hispanic groups than among African American respondents after controls for social learning and SES.

The addition of three social bonding variables in Model 4 makes a modest improvement in the longitudinal prediction of Underage Drinking. However, social bonding processes clearly do not mediate the effects of gender or race/ethnicity, because the main effects of the latter variables are unchanged from Model 3 to Model 4. Furthermore, the significant *positive* effect of School Commitment—i.e., the odds of Underage Drinking are higher among students with stronger bonds to school—runs contrary to the theoretical position of social bonding theory (but bear in mind the low alpha for this scale). The negative effect of strong Moral Beliefs on Underage Drinking is consistent with social bonding theory as well as with social learning theory, which would incorporate this factor as a measure of definitions unfavorable to deviant behavior (see Akers 1998, p. 83). In sum, social bonding variables fare no better than do social learning influences as mediators of gender and race/ethnic differences in Underage Drinking.

However, a third social bonding variable—Family Attachment—comes into play in Model 5, which includes the single significant interaction effect in our analysis of Underage Drinking. As shown in Figure 1, there is a negative relationship between Family Attachment and Underage Drinking, and this effect is much stronger for young women than it is for young men. Among respondents with low levels of Family Attachment, the rate of Underage Drinking is relatively high and very similar for men and women. However, at the highest level of Family Attachment, underage women are only about half as likely to drink compared to their male counterparts. Thus, the social bonding variable Family Attachment appears to be an

Table 2 Longitudinal logistic regression results for underage drinking (under 21 only; $n = 866$)

	Model 1		Model 2		Model 3		Model 4		Model 5	
Variable	*b*	Exp(*b*)	*b*	Exp(*b*)	*b*	Exp(*b*)	*b*	Exp(*b*)	*b*	Exp(*b*)
Gender: Male = 1	.622	1.863**	.657	1.928**	.734	2.084**	.690	1.993**	−.554	.575
Race/Ethnicity:										
White = 1	1.864	6.450**	1.592	4.913**	1.464	4.322**	1.530	4.620**	1.543	4.677**
Hispanic = 1	1.025	2.786**	1.016	2.763**	.965	2.625**	.952	2.591**	.939	2.557**
Cuban = 1	1.301	3.674**	1.295	3.651**	1.190	3.287**	1.188	3.281**	1.175	3.238**
Control Variable:										
SES			.313	1.367**	.306	1.358**	.314	1.368**	.318	1.375**
Social Learning Variables:										
Alcohol Use Harmful					−.276	.759**	−.251	.778**	−.250	.779**
DA Scale					.453	1.573**	.378	1.459**	.366	1.442*
Social Bonding Variables:										
Family Attachment							−.106	.900	−.365	.694*
School Commitment							.126	1.134*	.131	1.140*
Moral Beliefs							−.326	.722*	−.354	.702*
Interaction:										
Gender × Family Attachment									.356	1.428*
Constant	−1.151		−1.151		−1.037		−.378		.603	
Model chi-square		109.02**		122.83**		166.75**		175.85**		179.88**
Chi-square change				13.81**		43.92**		9.11*		4.03*

*$p \leq .05$. **$p \leq .01$.

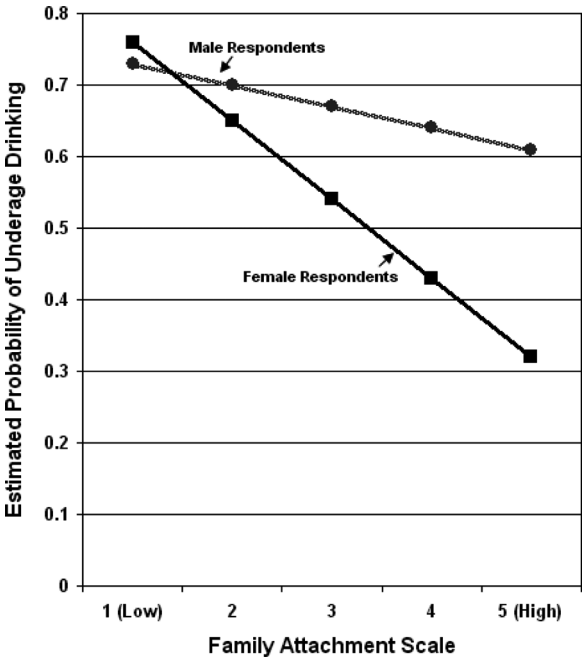

Figure 1 Gender by family attachment interaction for underage drinking controlling for other independent variables (respondents under 21 only).

important moderator of the relationship between gender and this particular form of deviant drinking.

Quantity-Frequency Scale: Multivariate Results

The OLS regression results for the Q-F scale among drinkers in the sample, which we report in Table 3, provide very little support for either social learning theory or social bonding theory. In fact, the only predictor that significantly affects the quantity and frequency of alcohol use among drinkers in late adolescence is, unsurprisingly, a control for Prior Drinking at wave 3 of the study. Consequently, a significant tendency for white adolescents to drink more heavily than do those from other groups is unaffected by the introduction of background, social learning, and social bonding variables in Models 2–4.

However, two significant interaction effects indicate that social bonding variables moderate the relationship between race/ethnicity and our measure of quantity and frequency of alcohol use. The interaction equation in Model 5 specifies a *positive* relationship between Family Attachment and the Q-F scale for the two Hispanic groups in contrast to *negative* relationships between these variables for white and black drinkers. Thus, contrary to the implications of social bonding theory, higher levels of Family Attachment among Hispanic respondents in mid-adolescence predict somewhat higher rates of alcohol use several years later.

Table 3 Longitudinal OLS regression results for quantity-frequency scale (drinkers only; $n = 584$)

	Model 1		Model 2		Model 3		Model 4		Model 5		Model 6	
Variable	*b*	β	*b*	β	*b*	β	*b*	β	*b*	β	*b*	β
Gender: Male = 1	.191	.057	.215	.064	.212	.063	.197	.059	.177	.053	.179	.053
Race/Ethnicity:												
White = 1	.787	.282**	.695	.249**	.668	.239**	.668	.239**	1.079	.386	−.922	−.330
Hispanic = 1	.276	.083	.236	.071	.241	.072	.246	.074	−.633	−.189	−1.992	−.596*
Cuban = 1	.300	.096	.242	.077	.232	.074	.243	.078	−.214	−.068	−1.608	−.514*
Control Variables:												
SES			.053	.039	.042	.031	.049	.036	.056	.042	.047	.035
Prior Drinking (Wave 3)			.044	.054	.009	.011	.000	.000	−.004	−.005	.009	.011
Social Learning Variables:												
Alcohol Use Harmful					−.157	−.118*	−.156	−.117*	−.153	−.114*	−.131	−.098
DA Scale					−.044	−.023	−.067	−.034	−.068	−.035	−.047	−.024
Social Bonding Variables:												
Family Attachment							.013	.010	−.029	−.022	.023	.017
School Commitment							−.036	−.039	−.032	−.035	−.026	−.028
Moral Beliefs							−.026	−.014	−.021	−.011	−.520	−.274*
Interactions:												
White × Family Attachment									−.122	−.159		
Hispanic × Family Attachment									.264	.279		
Cuban × Family Attachment									.136	.157		
White × Moral Beliefs											.487	.598*
Hispanic × Moral Beliefs											.694	.665**
Cuban × Moral Beliefs											.568	.587*
Constant	2.739		2.703		3.302		3.638		3.755		5.049	
Equation R^2		.046**		.050**		.059**		.061**		.073**		.073**
R^2 change				.004		.009		.002		.013*		.012*

*$p \leq .05$. **$p \leq .01$.

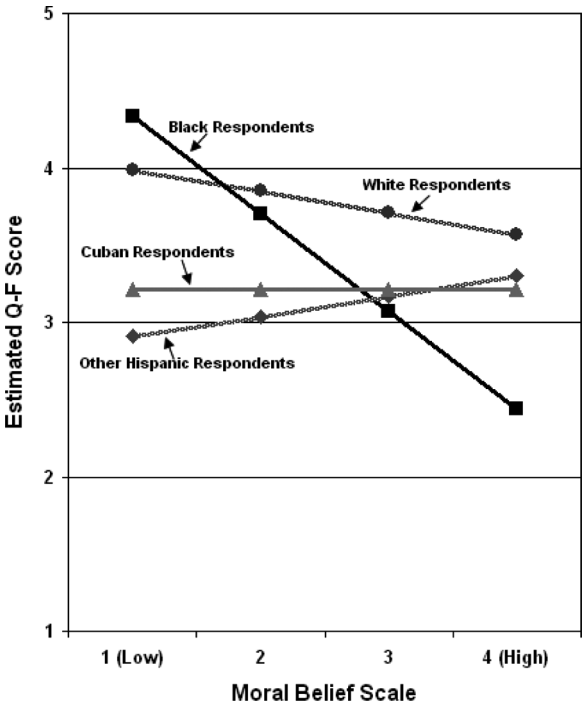

Figure 2 Race/ethnicity by moral belief interaction for Q-F scale controlling for other independent variables (respondents who drink).

The interaction equation in Model 6 singles out a strong, inverse relationship between Moral Beliefs and the Q-F scale that is *unique* to African American adolescent drinkers. As shown graphically in Figure 2, the slopes for the other three race/ethnic groups are essentially flat. This is because the positive coefficients for their respective product terms cancel out the significant negative coefficient for Moral Beliefs ($b = -.520$), which, of course, specifies the inverse relationship for the omitted reference group, African Americans. Moreover, under the condition of low levels of Moral Belief, black respondents appear to be equally or more likely to drink heavily as compared to white or Hispanic respondents—a sharp contrast to drinking patterns at high levels of Moral Belief, where black respondents have relatively low Q-F scores. This is a theoretically challenging finding: neither social learning theory nor social bonding theory can readily account for the unique influence of moral bonding on the drinking behavior of African Americans in late adolescence.

DSM-IV Alcohol Abuse: Multivariate Results

The logistic regression results for our final measure of deviant drinking—whether drinkers meet DSM-IV criteria for Alcohol Abuse—are reported in Table 4. Here, too, there is no support for the SSSL mediation hypothesis and no social learning variables are significantly related to this outcome. Across the four

Table 4 Longitudinal logistic regression results for DSM-IV alcohol abuse (drinkers only; $n = 584$)

	Model 1		Model 2		Model 3		Model 4	
Variable	*b*	Exp(*b*)	*b*	Exp(*b*)	*b*	Exp(*b*)	*b*	Exp(*b*)
Gender:								
Male = 1	.321	1.379	.352	1.422	.359	1.433	.314	1.369
Race/Ethnicity:								
White = 1	1.031	2.803**	.964	2.623**	.950	2.586**	.971	2.640**
Hispanic = 1	.573	1.774	.443	1.557	.459	1.583	.508	1.662
Cuban = 1	.815	2.259**	.628	1.873	.655	1.925	.738	2.092*
Control Variable:								
SES			−.089	.915	−.090	.914	−.049	.952
Prior Drinking (Wave 3)			.168	1.183**	.081	1.085	.038	1.038
Social Learning Variables:								
Alcohol Use Harmful					−.178	.837	−.167	.846
DA Scale					.147	1.159	.032	1.033
Social Bonding Variables:								
Family Attachment							−.020	.980
School Commitment							−.167	.846*
Moral Beliefs							−.110	.896
Constant	−1.772		−1.915		−1.576		.174	
Model chi-square		14.25**		25.30**		30.57**		39.04**
Chi-square change				11.05**		5.27		8.47*

*$p \leq .05$. **$p \leq .01$.

models in this analysis, white drinkers are consistently much more likely to meet the criteria for Alcohol Abuse than are African American drinkers, and this pattern is unaffected by controls for SES, Prior Drinking, and the two sets of theoretical variables. We also find some evidence for higher levels of DSM-IV Alcohol Abuse among Cuban Hispanics relative to African Americans in Models 1 and Model 4. The only theoretical variable that attains statistical significance is School Commitment, which is negatively related to this measure of deviant drinking.

DISCUSSION AND CONCLUSIONS

These longitudinal analyses yield some interesting findings that are relevant to understanding gender and race/ethnic differences in deviant drinking. And, yet, they offer surprisingly little support for the key predictions of the SSSL framework. To be sure, our results show that differential association and negative definitions of alcohol use are significant predictors of the onset of underage drinking in late adolescence and of higher levels of alcohol use among drinkers. Nonetheless, we find virtually no indication that these social learning variables—or the social bonding variables—mediate gender differences in underage drinking or explain away substantial variations in drinking behavior among the four race/ethnic groups in our sample. Based on these results, then, we would reject the SSSL mediation hypothesis.

On the other hand, no news is good news for the SSSL generality hypothesis. Although several interaction effects emerged in our multivariate analyses, none of these group-specific patterns involved our measures of differential association and

negative definitions of alcohol. At least with regard to deviant drinking, these social learning mechanisms appear to operate similarly for men and women and for the four race/ethnic groups in our sample.

Two of our analyses provide some support for the SSSL comparative hypothesis in that social learning variables are better than social bonding variables at predicting underage drinking and heavier alcohol use. In fact, higher scores on one social bonding measure, School Commitment, actually increase the odds of underage drinking. Interestingly, this same measure is negatively related to DSM-IV Alcohol Abuse—the only significant relationship we found in that analysis. Perhaps the first finding reflects a relatively benign process of social integration into a college-oriented drinking culture, whereas the latter finding speaks to the role of alienation from school in the onset of more serious drinking problems. Clearly, the shifting relationship between commitment to school and various forms of deviant drinking among adolescents is an issue that deserves further empirical examination with a more adequate measure of this variable.

Some intriguing leads for future research are also given by the interactions involving measures of family attachment and moral beliefs. As a moderator of the relationship between gender and underage drinking, family attachment partially explains the greater prevalence of underage drinking among adolescent men. Strong family attachment seems to bring with it a double standard that discourages underage drinking among women but not men. At the other end of the scale, young women who are less tightly bonded to their families appear to be as free to drink as are young men in general. Thus, adding a feminist twist to the predictions of bonding theory, this finding suggests that paternalistic norms and controls give special force to the constraints of family attachment on the decisions of young women to begin drinking. However, the absence of gender differences or gender-related interactions for the Q-F scale indicates that paternalistic controls are less salient once young women actually start to drink (as well as become older).

The interaction of race/ethnicity and moral beliefs in our analysis of the Q-F scale highlights a distinctive feature of African American drinking patterns that is difficult to reconcile with social bonding theory or, for that matter, social learning theory. Why would black students' beliefs about dishonest behavior be so closely and uniquely tied to their drinking behavior four or five years later? Conversely, why don't variations in the strength of this moral bond affect white or Hispanic drinking patterns? These questions raise the prospect of subcultural variations or structural contingencies that fall outside the scope of micro-level theories. The pursuit of answers to these questions should be high on the agenda of researchers interested in the links between inequality and alcohol problems. At least among black adolescents and young adults, strong moral beliefs appear to be a key factor in the social regulation of drinking behavior in the face of high levels of stress and other disadvantages that confront many African Americans (see Turner and Lloyd 2003).

AUTHOR NOTES

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