Published in final edited form as:

Subst Use Misuse. 2009 ; 44(8): 1121–1141. doi:10.1080/10826080802494727.

Typologies of Alcohol Use in White and African American Adolescent Girls

Sarah Dauber,

National Center on Addiction and Substance Abuse at Columbia University

Aaron Hogue,

National Center on Addiction and Substance Abuse at Columbia University

James F. Paulson, and

Division of Behavioral Research and Community Health, Department of Pediatrics, Eastern Virginia Medical School

Jenn A. Leiferman

Department of Preventive Medicine and Biometrics, University of Colorado Denver Health Sciences Center School of Medicine

Abstract

This study examined typologies of alcohol use in 2948 White and African American adolescent girls using data from the National Longitudinal Study of Adolescent Health. Self-report data were collected on frequency and quantity of alcohol use, negative consequences and high risk drinking behaviors, as well as co-occurring internalizing and externalizing problems. Latent class analysis revealed a four-group typology for White girls and a three-group typology for AA girls. Problematic drinkers had more internalizing and externalizing problems in both racial groups. The study's limitations and implications are discussed.

Keywords

alcohol; adolescents; race; drinking typologies

Alcohol is the most widely used substance among adolescent girls, with 75% reporting lifetime use by the end of high school, and 43% reporting past month use (Centers for Disease Control and Prevention (CDC), 2006). Rates of heavy alcohol use among adolescent girls range from 16% to 24%, according to recent survey data (CDC, 2006; Substance Abuse and Mental Health Services Administration (SAMHSA), 2006). High rates of use combined with associated negative outcomes, including motor vehicle accidents, risky sexual behavior, mental health problems, and delinquency (Arata, Stafford, & Tims, 2003), have made the prevention of adolescent alcohol use a national priority (United States Department of Health and Human Services, 2000). The majority of existing research on adolescent alcohol use has focused on samples of boys, or boys and girls together; however studies showing sex differences in the nature and correlates of adolescent alcohol use suggest the need for more

Correspondence concerning this article should be addressed to Sarah Dauber, Research Associate, Health and Treatment Research, National Center on Addiction and Substance Abuse at Columbia University, 633 Third Avenue, New York, NY 10017. sdauber@casacolumbia.org.

Persons interested in obtaining data files from Add Health should contact Add Health, Carolina Population Center, 123 W. Franklin Street, Chapel Hill, NC 27516-2524 (addhealth@unc.edu).

within-sex research (Andrews, 2005). The current study adds to the sparse literature in this area by focusing only on girls.

Race differences in the prevalence rates of alcohol use among adolescent girls are well-established, with surveys typically showing higher rates of alcohol use in White girls compared to African American (AA) girls (CDC, 2006; Johnston, O'Malley, Bachman, & Schulenberg, 2006; SAMHSA, 2006). Previous research has also supported the existence of several subtypes of adolescent alcohol users, and White adolescents are more likely than AA adolescents to be in the more problematic subgroups (Orlando, Tucker, Ellickson, & Klein, 2005; Schulenberg, O'Malley, Bachman, Wadsworth, & Johnston, 1996; Stewart & Power, 2002). However, it is not known whether the number and structure of subgroups vary by race; that is, whether race-specific typologies of adolescent alcohol use exist. Moreover, while studies have shown that problem drinkers tend to have the highest rates of co-occurring emotional and behavioral problems (Colder & Chassin, 1999; Windle, 1996), the extent to which the patterns of co-occurrence of these problems vary by race is not well understood. The current study aims to address these gaps in the literature by examining race-specific typologies of alcohol use, as well as co-occurring internalizing and externalizing problems, in a nationally representative sample of White and African American adolescent girls.

Typologies of Adolescent Alcohol Users

Adolescent alcohol users are a heterogeneous group, with several subtypes of users consistently emerging in White samples, including abstainers, experimenters, heavy drinkers, and problem drinkers (Colder & Chassin, 1999; Reboussin, Song, Shrestha, Lohman, & Wolfson, 2006; Steinhausen & Metzke, 2003; Windle, 1996). These subtypes are typically distinguished based on frequency and quantity of use and associated negative consequences, and their validity is supported by differences among subtypes in severity of co-occurring psychological and behavioral problems. For example, problem users have the highest levels of externalizing behaviors as well as the most stressful life events and emotional distress (Colder & Chassin, 1999; Steinhausen & Metzke, 2003; Windle, 1996). Taken together, these studies have established a typology of adolescent alcohol users in White samples, however the extent to which this typology generalizes to minority adolescents is not known.

Several existing studies have examined race differences in patterns of adolescent alcohol use either at a single time point (Stewart & Power, 2002) or over time (Flory, Brown, Lynam, Miller, Leukefeld, & Clayton, 2006; Orlando, et al., 2005; Schulenberg et al., 1996). Nearly all of these studies created subtypes of alcohol users based on the entire sample and then examined race differences in subtype membership. Findings of these studies suggest that White adolescents are more likely than AA adolescents to be in risky subtypes of alcohol users, characterized by escalating levels of use and associated problems over time (Orlando et al., 2005; Schulenberg et al., 1996; Stewart & Power, 2002). While these studies represent some of the best evidence to date regarding race differences in patterns of adolescent alcohol use, they do not allow for the possibility that the number and characteristics of the subtypes may differ for different racial groups. Only one study has created subtypes of alcohol users separately by race. Flory and colleagues (2006) found differences in the developmental trajectories of frequency of alcohol use in a community sample of AA and White adolescents from early adolescence through age 20. While three groups of alcohol users were found for both AA and White adolescents, an abstainers group was found for AA adolescents only, and the subtypes of White users were characterized by higher rates of use, although this difference lessened over time.

Race Differences in Co-Occurring Internalizing and Externalizing Problems

Alcohol and drug use in adolescents often co-occur with other problematic behaviors such as delinquency, truancy, and poor academic performance, as well as internalizing symptoms such as depression and anxiety (Armstrong & Costello, 2002). Some research has suggested that there may be race differences in the rates of these problems and in the degree to which each of these problems is associated with substance use¹ in adolescents (Wallace & Muroff, 2002). Several studies have found race differences in rates of co-occurrence of depression and alcohol use in adolescents (Kilpatrick, Ruggiero, Acierno, Saunders, Resnick, & Best, 2003; Maag & Irvin, 2005), however findings are generally inconclusive regarding which racial group has higher rates of co-occurring symptoms. Involvement in delinquency has been associated with higher risk for substance use among both AA and White youth, however some studies have shown that school-related conduct problems specifically may have a greater impact on substance use for White youth (Wells, Morrison, Gillmore, Catalano, Iritani, & Hawkins, 1992). Overall, while research has demonstrated race differences in rates of co-occurrence of substance use with internalizing and externalizing problems, the extent to which there are race differences in these co-occurring problems for particular subtypes of alcohol users has not been adequately examined to date.

Substantive and Methodological Advances of the Current Study

The current study advances past research in several important ways. First, most studies have created alcohol use typologies using samples of White adolescents; the extent to which the subtypes developed based on White adolescents generalize to adolescents of other ethnic backgrounds has not yet been established. Additionally, most previous studies have used clinical (Chung & Martin, 2001; Tarter, Kirisci, & Mezzich, 1997) or community samples (Colder & Chassin, 1999; Windle, 1996) to examine subtypes of adolescent alcohol users. The use of a large, nationally representative normative sample of adolescents is a strength of the current study, and will provide important information on whether previously defined alcohol use typologies generalize to a nationally representative sample. In terms of methodology, the current study is one of only a few studies to use state-of-the-art statistical methods to empirically define subtypes of alcohol users based on patterns of responses on a wide range of variables, including quantity and frequency of use, consequences of use in multiple domains, and high-risk drinking behaviors. Moreover, this study is the very first to conduct these analyses separately by race.

Study Goals and Hypotheses

The goals of the current study were to (a) investigate whether different typologies of alcohol users exist for White and AA adolescent girls, and (b) examine differences among subtypes of users on co-occurring internalizing and externalizing behaviors within racial groups. Based on previous research (Flory et al., 2006), we expected to find race differences in typologies, with groups of more problematic alcohol users emerging for White girls compared to AA girls. We also expected to find higher rates of co-occurring internalizing and externalizing behaviors in subtypes of more problematic alcohol users. Due to the limited research base examining race differences in this area, no specific hypotheses about race differences in patterns of co-occurring problems were developed.

---

¹Many studies in this area focus on substance use in general, including both alcohol and drug use. Where available, we present findings specific to alcohol use, but otherwise we use the term “substance use” to refer to studies that have combined across alcohol and other drugs.

Method

Data Source

This study used data from Wave I of the National Longitudinal Study of Adolescent Health (Add Health: Udry, 2003). A nationally representative sample of adolescents in grades 7 through 12 were recruited and assessed between 1994 and 1995. A sample of 80 high schools and 52 middle schools from the US was selected with unequal probability of selection. Incorporating systematic sampling methods and implicit stratification into the Add Health study design ensured this sample is representative of US schools with respect to region of country, urbanicity, school size, school type, and ethnicity. A random sample of adolescents who completed the Wave 1 in-school interview were included in the core in-home sample, which consisted of an in-home interview of the target adolescent and one of his/her parents. Adolescents from specific ethnic groups were oversampled (i.e., African Americans from well-educated families, Chinese, Cuban, and Puerto Rican). The final public-use dataset includes a total of 6504 cases in the core in-home sample assessed at Wave I, 3356 of which are female.

Sample

The sample for the current study included the 2948 female adolescent respondents at Wave I of the Add Health in-home sample who self-reported their race as either White (N=2126) or AA (N = 822), and were between the ages of 13 and 19 years. Overall, the two racial groups were demographically similar, with the following exceptions: White girls were more likely to have attended substance abuse treatment, and AA girls were more likely to be from single parent families and to belong to families on public assistance (see Table 1 for sample demographics).

Measures

Alcohol Use—The Add Health survey included 18 questions about the adolescent's use of alcohol in the past year. All items were recoded due to low frequencies of many response categories. Three items assessed frequency of use: frequency of drinking outside the family, frequency of heavy drinking (i.e., drinking 5 or more drinks in a row), and frequency of getting drunk (once a month or less, more than once a month). Quantity of alcohol consumption was assessed with one item asking for the number of drinks consumed at each drinking episode (one, 2-3, 4 or more). Adolescents were asked whether they had experienced 9 types of consequences of alcohol use, such as problems with parents, physical fights, or regretting actions (yes/no). Finally, five items asked about high-risk drinking behaviors, such as driving while drunk, drinking at school, carrying a weapon while drinking, drinking alone, and drinking while using drugs (yes/no). Each item had a “never drank” option, endorsed by all respondents who did not consume any alcohol in the past year.² In order to provide maximum information for creating subtypes, each item was entered separately into the analysis.

Internalizing problems—Internalizing problems were measured by adolescent-reported depressive symptoms on the Center for Epidemiologic Studies Depression Scale (CES-D: Radloff, 1977). Respondents were asked to rate their level of 20 symptoms of depression in the past week on a scale ranging from never or rarely to most or all of the time. Responses

²The five items pertaining to high risk drinking behaviors asked about the adolescent's entire life, rather than just the past year. Thus, 253 girls who reported no alcohol use in the past year responded to these items. Of these, 219 answered no to all of them, and 34 responded yes to one or more of them, indicating that while they did not use any alcohol in the past year, they did at some previous point engage in one of the high-risk drinking behaviors. For the purposes of the current study, which is focused on past year drinking only, these girls were classified as “non-users” and their responses on these items were recoded to reflect this.

on all items were summed to create a total score, ranging from 0 to 60. The CES-D has been widely used to measure depressive symptoms in both clinical (Lawrence, Standiford, Loots, Klingensmith, Williams, Ruggiero, et al., 2006) and normative (Garrison, Addy, Jackson, McKeown, & Waller, 1991; Lewinsohn, Clarke, Seeley, & Rhode, 1994) samples of adolescents. As in other studies using the CES-D with non-clinical samples, total scores on the CES-D were used in the current study as a continuous measure of internalizing problems (Wiesner & Kim, 2006). However, to give an indication of the clinical significance of the depressive symptoms in the current sample, we used the clinical cutoff score of 24, previously established for adolescent girls, to indicate more severe depressive symptoms (Roberts, Lewinsohn, & Seeley, 1991). In the current sample, 9% of White girls and 12% of AA girls scored above the clinical cutoff. Note that these scores represent levels of symptom severity and do not necessarily correspond to psychiatric diagnoses.

Externalizing Problems—Externalizing problems were measured by an academic misbehavior scale and a delinquency scale. The academic misbehavior scale (Crosnoe & Elder, 2004) was created based on five items from the Add Health survey: whether the adolescent repeated the last grade in school (1=yes), whether the adolescent had trouble completing homework in the past year (0=never to 4=everyday), whether the adolescent had been suspended or expelled during the last year (1=yes for each), whether the adolescent skipped school in the past year (1=yes), and the adolescent's reverse-coded grade point average (average of self-reported grades in English, math, social studies, and science in the past year). The five items were standardized and summed to create the scale, with high scores indicating more academic misbehavior. Crosnoe and Elder reported inter-item correlations ranging from .10 ($p < .001$) to .28 ($p < .001$).

Delinquency was measured by 17 items on the Add Health survey asking respondents how often they had committed each delinquent act in the past year (e.g., painting graffiti, stealing a car, selling drugs, and pulling a knife/gun on someone). Items are comparable to items on the Self-Report Delinquency Scale (SRD: Elliott, 1983), a widely used measure of delinquent behavior in adolescent samples (Huizinga & Elliot, 1983). All items were coded dichotomously (yes/no) because of low frequency of responses to higher-order categories. As in previous studies (Haynie, 2002; Mason, Hitchings, & Spoth, 2007) the 17 items were summed to create a delinquency index, with scores ranging from 0 to 17. The total score demonstrated adequate reliability, with Cronbach's alpha of .76 for White girls and .73 for AA girls.

Data Analysis

Latent class analysis (LCA: McCutcheon, 1987) was used to create subtypes of alcohol users by grouping similar individuals based on their patterns of responses on the self-reported indicators of alcohol use behaviors. LCA has been previously used in normative and clinical adolescent samples to develop typologies of individuals based on patterns of behaviors and psychiatric symptoms (e.g., Chung & Martin, 2001; Reboussin et al., 2006; Rindskopf, 2006). The central assumption of LCA is that correlations among the observed indicators can be explained by a set of underlying latent classes plus error (Muthen, 2004). Model parameters estimated in LCA include conditional latent class probabilities, which refer to the average probabilities of endorsing each response category of each observed indicator, given membership in a particular latent class. These probabilities are analogous to factor loadings in factor analysis, and are used to define and label the latent classes.

LCA models were specified using Mplus version 4.2 (Muthen & Muthen, 1998-2004). Separate models were fit for White and AA adolescent girls, and all models were adjusted for the weighted sampling design of Add Health (Harris, Florey, Tabor, Bearman, Jones, &

Udry, 2003). For all models, multiple sets of random starting values were used to prevent local solutions and to maximize model stability (Muthen, 2004). Beginning with a two-class model for each racial subgroup, successive models were fit with an increasing number of classes until the best-fitting model was found. Model fit was evaluated based on the loglikelihood value, AIC, and BIC, with lower values indicating better fit (Nylund, Asparouhov, & Muthen, in press). Entropy, a summary index of classification quality, was also considered when evaluating model fit, with values closer to 1.0 indicating better fit. Following the selection of the best-fitting model for each racial subgroup, individuals were assigned to classes based on the highest conditional probability of assignment. Then, differences among the latent classes on internalizing and externalizing problems were examined for each racial group using an omnibus *F*-test for each variable, followed by a series of planned contrasts to test for all possible mean differences among latent classes. For all analyses, alpha was adjusted to control for familywise error. This post-hoc approach to examining differences among latent classes has been used in other studies (e.g., Agrawal, Lynskey, Madden, Bucholz, & Heath, 2006; Grant, Scherrer, Neuman, Todorov, Price, & Bucholz, 2006; Reboussin et al., 2006).

Results

Comparisons of White and AA Girls on Study Variables

White and AA girls were compared on all alcohol use variables, internalizing and externalizing problems using chi-square tests for categorical variables and *F*-tests for continuous variables (see Table 2). Significant race differences were found on all variables, with AA girls generally reporting less alcohol use and related consequences, and more internalizing and externalizing problems than White girls.

Latent Class Analysis of Alcohol Use and Related Behaviors

LCA was conducted separately for White and AA girls on the alcohol use indicators (see Tables 3 and 4). Based on a combination of statistical (see notes to Tables 3 and 4) and substantive criteria, the four-class model was selected for White girls and the three-class model was selected for AA girls.

White Girls—The four-class model was selected for White girls. Although the loglikelihood and AIC values continued to decrease in successive models, the lowest BIC value was obtained for the four-class model (see note to Table 3), and classification quality continued to decline in successive models. Classification quality for the four-class model was excellent, with an entropy value of .95, and average probabilities of 1.00, .96, .93, and .96 for each of the four classes. Estimated conditional probabilities for each class are displayed in Table 3.

Half of the sample were abstainers, who reported never using alcohol in the past year. Approximately 21% were experimenters, characterized by infrequent light drinking in the past year, and very low rates of consequences. The majority of experimenters (90%) reported drinking once a month or less in the past year, 86% reported no instances of heavy drinking, and 82% reported no instances of getting drunk in the past year. Over 90% of this group reported no consequences of use or high-risk drinking behaviors.

Another 20% of the sample was classified as moderate drinkers, reporting higher frequencies of drinking and slightly more consequences than experimenters. Approximately 32% reported drinking more than once a month, and 63% reported drinking 4 or more drinks each time. The majority (approx. 80%) had at least one episode of heavy drinking, and 92% had at least one episode of getting drunk in the past year. Rates of consequences among the

moderate drinkers ranged from 7% (school problem) to 29% (date problem). Additionally, 50% reported regretting actions, and 26% reported regretting sex due to alcohol use. The moderate drinkers also reported higher rates of high-risk drinking behaviors than the experimenters, with 16% reporting driving drunk, 11% drinking at school, 41% drinking alone, and 33% drinking while using other drugs.

The final class of White girls comprised 9% of the sample and was labeled heavy drinkers, due to high rates of heavy drinking, consequences, and high-risk drinking behaviors. More than half of heavy drinkers (60%) reported drinking once a week or more in the past year, and 90% had 4 or more drinks each time. Additionally, 91% reported heavy drinking more than once a month, and 88% reported getting drunk more than once a month. Rates of consequences were highest in this group, ranging from 16% (school problems) to 40% (date problem). Heavy drinkers were most likely to regret actions (62%) and regret sex (47%) due to alcohol. Finally, rates of high-risk drinking behaviors were highest among heavy drinkers, with 28% involved in a physical fight, 32% driving drunk, 35% drinking at school, 10% carrying a weapon, 50% drinking alone, and 57% drinking while using other drugs.

African American Girls—For AA girls, the 3-class model had the lowest BIC value (see note to Table 4), and was selected. Classification quality of the 3-class model was excellent, with an entropy value of .98, and average probabilities of 1.00 .99, and .98 for each of the 3 classes. Estimated conditional probabilities for each class are shown in Table 4. Similar to White girls, the majority of the sample were abstainers (68%) and 23% were experimenters. AA experimenters were similar to White experimenters in their low rates of alcohol use and associated problems. One exception is drinking alone, which was reported by 30% of AA experimenters, compared to only 15% of White experimenters.

The third class of AA girls, labeled problem drinkers (8.4% of the sample), was characterized by a profile of probabilities somewhere in between the White moderate and heavy drinkers. Slightly more than half (53%) reported drinking once a week or more in the past year, and 64% reported having four or more drinks each time. Approximately 55% reported heavy drinking more than once a month, and 62% reported getting drunk more than once a month in the past year. Rates of consequences ranged from 9% (school problems) to 41% (date problems), similar to the White heavy drinkers. AA problem drinkers differed widely from White moderate and heavy drinkers on several of the high-risk drinking behaviors. Specifically, only 8% of AA problem drinkers reported driving while drunk, compared to 16% of White moderate drinkers and 32% of White heavy drinkers. Twenty-five percent of AA problem drinkers reported drinking at school, compared to 11% of White moderate drinkers and 35% of White heavy drinkers. Strikingly, 18% of AA problem drinkers reported carrying a weapon while drinking, compared to 2% of White moderate drinkers and 10% of White heavy drinkers. Finally, 28% of AA problem drinkers reported drinking while using other drugs, compared to 33% of White moderate drinkers and 57% of White heavy drinkers.

Within-Race Comparison of Latent Classes on Internalizing and Externalizing Problems

Latent classes were compared on internalizing and externalizing problems using *F*-tests, followed by a series of planned comparisons to test for all possible differences in means, adjusting alpha to control for familywise error. Age and SES (measured by mother's education, as in previous Add Health studies [e.g., Ford, Pence, Miller, Resnick, Bearinger, & Pettingel, et al., 2005]) were controlled in all analyses. Results are presented in Table 5.

White Girls—As expected, younger adolescents (age 13 to 15) were more likely to be abstainers and experimenters than older adolescents (age 16 to 19) ($\chi^2(3) = 539.3, p < .001$).

No significant class differences were found for mother's education. Moderate and heavy drinkers had significantly higher rates of depressive symptoms ($F(5, 127) = 33.6, p < .001$), delinquency ($F(5, 127) = 49.8, p < .001$), and academic misbehavior ($F(5, 127) = 37.3, p < .001$) than abstainers and experimenters. Moderate and heavy drinkers differed from each other only on the two measures of externalizing behavior, with heavy drinkers scoring higher on both. Abstainers had fewer internalizing and externalizing problems than all three groups of drinkers.

African American Girls—Similar to White girls, older AA girls were more likely to be experimenters and problem drinkers ($\chi^2(2) = 241.8, p < .01$). Mother's education also differed significantly among the three classes, with higher education more likely among the abstainers and experimenters ($\chi^2(6) = 184.6, p < .05$). Problem drinkers reported higher levels of depressive symptoms ($F(4, 128) = 11.7, p < .001$), delinquency ($F(4, 128) = 20.9, p < .001$), and academic misbehavior ($F(4, 128) = 10.8, p < .001$) than abstainers. Problem drinkers also reported higher rates of delinquency than experimenters, who in turn had higher rates of delinquency than abstainers.

Discussion

This study found differences in the number and characteristics of subtypes of alcohol users for White and AA adolescent girls, supporting the need for race-specific typologies of adolescent drinkers. A four-group typology was found for White girls, including abstainers, experimenters, moderate drinkers, and heavy drinkers. For AA girls, only three subtypes emerged: abstainers, experimenters, and problem drinkers. Differences among the subtypes on externalizing and internalizing behaviors were also found, with more problematic subtypes exhibiting higher rates of these problems in both racial groups.

The four subtypes of drinkers that emerged for White girls are consistent with results found in other studies of White samples of adolescents (Colder & Chassin, 1999; Steinhausen & Metzke, 2003; Windle, 1996). Thus, our findings for White girls extend the validity of the previously defined four-group drinker typology to a nationally representative sample of girls. As hypothesized, this four-group typology did not generalize to AA girls in our sample. Very little previous research has examined race differences in typologies of adolescent alcohol users, and those studies that have done so have generated subtypes based on mixed racial groups and then examined differences in the racial makeup of each subtype (Orlando et al., 2005; Schulenberg et al., 1996; Stewart & Power, 2002). These studies, although they included AA participants, generated essentially the same four-group typology as that found for the White girls in the current study. Thus, the current study is among the first (Flory et al., 2006) to provide evidence that the number and structure of subtypes of alcohol users may be different for AA adolescents.

Consistent with known rates of alcohol use among AA and White adolescents (CDC, 2006), a higher percentage of AA girls were abstainers than White girls. Moreover, for AA girls, more than 90% of the sample were either abstainers or experimenters, compared to 70% of the sample of White girls. White and AA experimenters were similar in terms of frequency and quantity of alcohol use, as well as rates of associated negative consequences. Race differences in typologies emerged most clearly for the subtypes of more problematic drinkers. For White girls, there were two such groups (moderate drinkers and heavy drinkers), distinguished both by frequency of use and rates of negative consequences and high-risk drinking behaviors. This finding supports previous studies that have differentiated among subtypes of problematic alcohol users in largely White samples (Chung & Martin, 2001; Reboussin et al., 2006). The emergence of only one problematic alcohol use group

among AA girls suggests that AA problematic alcohol users may be a more homogenous group than White problem drinkers.

The AA problem drinkers in the current study can be described as falling somewhere in between the White moderate and heavy drinkers in terms of frequency and consequences of use. Specifically, the AA problem drinkers used alcohol about as frequently as the White heavy drinkers, and drank heavily and got drunk more often than the White moderate drinkers, but less often than the White heavy drinkers. Rates of consequences for the AA problem drinkers were similar overall to the White heavy drinkers. A fairly consistent finding in the literature is that despite having lower rates of substance use, AA adolescents tend to experience higher rates of negative consequences of use (Harrison, 1992; Herd, 1995). Interestingly, AA problem drinkers had lower rates of driving drunk and drinking while using drugs than both groups of White problematic drinkers, and higher rates of carrying a weapon while drinking than both groups of Whites. Other national studies have found higher rates of carrying a weapon among AA adolescent girls compared to White girls (CDC, 2006).

For White girls, the moderate and heavy drinking subtypes were characterized by higher rates of co-occurring internalizing and externalizing problems compared to abstainers and experimenters. These findings are consistent with past research that suggests that abstainers and experimenters represent more normative types of adolescent alcohol users (Colder & Chassin, 1999; Steinhausen & Metzke, 2003; Windle, 1996), and are not necessarily associated with psychological and behavioral problems. It has even been suggested that some experimentation with substances in adolescence is a normal part of adolescent exploration and identity development, and is associated with more positive adjustment than complete abstention (Shedler & Block, 1990; Siebenbruner, Englund, Egeland, & Hudson, 2006). Consistent with past literature, White moderate and heavy drinkers differed on externalizing problems, with heavy drinkers having higher rates of delinquency and academic misbehavior (Siebenbruner et al., 2006; Steinhausen & Metzke, 2003; Windle, 1996). Interestingly, White moderate and heavy drinkers did not differ on depressive symptoms. Overall, for White girls, both internalizing and externalizing symptoms distinguished between “normative” drinkers (abstainers and experimenters) and “problematic” drinkers (moderate and heavy drinkers), but only externalizing symptoms further distinguished between types of problematic drinkers. This suggests that among White girls, more internalizing symptoms may be a marker for crossing over from experimental alcohol use into moderate use, and more externalizing problems may be a marker for crossing over into the heaviest and most problematic subtype. This interpretation is consistent with the idea of two types of problematic drinkers, an internalizing type and an externalizing type, and further suggests that the internalizing type may be characterized by slightly less problematic drinking behaviors than the externalizing type (Steinhausen & Metzke, 2003). Future research using longitudinal data is needed to clarify this finding.

Among AA girls, delinquency distinguished between all three subtypes, with problem drinkers having the highest rates, followed by experimenters, and then abstainers. Internalizing symptoms and academic misbehavior only distinguished the problem drinkers from the abstainers, and not from the experimenters. Thus, externalizing problems may be a marker for more severe problems with alcohol use in both racial groups. For White girls, this relationship was found for both delinquency and academic misbehavior, however for AA girls, only delinquency distinguished the most problematic drinkers. This is consistent with past research that found that school-related externalizing problems may impact substance use more for White youth than for AA youth (Wells et al., 1992).

Taken together, the results of this study suggest that for both White and AA adolescent girls, the most problematic alcohol users are distinguished largely by the presence of co-occurring externalizing problems, particularly delinquency. It should be noted that rates of depressive symptoms were low in general for the study sample. In both racial groups, the average symptom score for all subtypes of alcohol users fell well below the clinical cutoff for depression, however the more problematic subtypes did have a higher percentage of girls with depression scores above the clinical cutoff in both racial groups. Additionally, it is important to note that several of the items on the delinquency scale involved substance use, such as selling drugs, fighting while using drugs, and carrying a weapon while using drugs. This overlap in constructs may have contributed to the strong association between delinquency and problematic alcohol use, however these items were retained in the delinquency scale in order to be consistent with past research using this measure.

The results of this study must be considered in light of several limitations. First, the data are cross-sectional, so it is unknown whether the latent classes represent actual distinct subtypes of adolescent alcohol users, or adolescents in different stages of use. Additionally, because of the cross-sectional nature of the data, we could not determine the temporal order of alcohol use and internalizing and externalizing problems. Finally, due to small numbers of respondents in racial groups other than White and AA, we were not able to determine whether race-specific alcohol use typologies would emerge for other racial groups.

Our results reinforce the need for further within-race investigations of the nature and correlates of alcohol use among adolescent girls. The limited research that has been done in this area has found some evidence for race differences in risk and protective factors when comparing adolescent alcohol users to abstainers (Wallace & Muroff, 2002). Given the race differences found in the current study in alcohol use typologies, a reasonable next step is to attempt to clarify the antecedents leading to specific subtypes of alcohol users within racial groups. For example, what risk factors differentiate experimenters from problematic users, and do these risk factors differ for White and AA adolescents? Longitudinal studies are also needed to determine whether the race-specific typologies found in the current study are stable over time, as well as their association with various outcomes in young adulthood and beyond. We expect to examine some of these research questions in future studies using the two follow-up waves of the Add Health data. Research of this nature will increase our limited understanding of race differences in alcohol use and co-occurring problems, and inform the development of targeted alcohol prevention programs.

Acknowledgments

Preparation of this article was supported by grant R03 MH079044-01 from the National Institute of Mental Health. This research used data from Add Health, a program project designed by J. Richard Udry, Peter S. Bearman, and Kathleen Mullan Harris, and funded by a grant P01-HD31921 from the National Institute of Child Health and Human Development, with cooperative funding from 17 other agencies. Special acknowledgement is due Ronald R. Rindfuss and Barbara Entwisle for assistance in the original design.

References

- Agrawal A, Lynskey MT, Madden PAF, Bucholz KK, Heath AC. A latent class analysis of illicit drug abuse/dependence: Results from the National Epidemiological Survey on Alcohol and Related Conditions. *Addiction*. 2006; 102:94–104. [PubMed: 17207127]
- Andrews, JA. Substance abuse in girls. In: Bell, DJ.; Foster, SL.; Mash, EJ., editors. *Handbook of Behavioral and Emotional Problems in Girls*. New York, NY: Plenum; 2005.
- Arata C, Stafford J, Tims M. High-school drinking and its consequences. *Adolescence*. 2003; 38(151): 567–579. [PubMed: 14768998]

- Armstrong TD, Costello EJ. Community studies on adolescent substance use, abuse, or dependence and psychiatric comorbidity. *Journal of Consulting and Clinical Psychology*. 2002; 70(6):1224–1239. [PubMed: 12472299]
- Centers for Disease Control and Prevention. Surveillance Summaries. Vol. 55. June 9. 2006 Youth Risk Behavior Surveillance—United States 2005. *MMWR* 2006
- Chung T, Martin CS. Classification and course of alcohol problems among adolescents in addictions treatment programs. *Alcoholism: Clinical and Experimental Research*. 2001; 25(12):1734–1742.
- Colder CR, Chassin L. The psychosocial characteristics of alcohol users versus problem users: Data from a study of adolescents at risk. *Development and Psychopathology*. 1999; 11:321–348. [PubMed: 16506537]
- Crosnoe R, Elder GH. Family dynamics, supportive relationships, and educational resilience during adolescence. *Journal of Family Issues*. 2004; 25(5):571–602.
- Elliot, DS. The Prevalence and Incidence of Delinquent Behavior: 1976-1980. Behavioral Research Institute; Boulder, CO: 1983.
- Flory K, Brown TL, Lynam DR, Miller JD, Leukefeld C, Clayton RR. Developmental patterns of African American and Caucasian Adolescents' alcohol use. *Cultural Diversity and Ethnic Minority Psychology*. 2006; 12(4):740–746. [PubMed: 17087533]
- Ford CA, Pence BW, Miller WC, Resnick MD, Bearinger LH, Pettingell S, Cohen M. Predicting adolescent's longitudinal risk for sexually transmitted infection. *Archives of Pediatric and Adolescent Medicine*. 2005; 159:657–664.
- Garrison CZ, Addy C, Jackson KL, McKeown R, Waller JL. The CES-D as a screen for depression and other psychiatric disorders in adolescents. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1991; 30:636–641. [PubMed: 1890099]
- Grant JD, Scherrer JF, Neuman RJ, Todorov AA, Price RK, Bucholz KK. A comparison of the latent class structure of cannabis problems among adult men and women who have used cannabis repeatedly. *Addiction*. 2006; 101:1133–1142. [PubMed: 16869843]
- Harris, KM.; Florey, F.; Tabor, J.; Bearman, PS.; Jones, J.; Udry, JR. The National Longitudinal Study of Adolescent Health: Research Design (WWW document. 2003. URL: <http://www.cpc.unc.edu/projects/addhealth/design>
- Harrison LD. Trends in illicit drug use in the United States: Conflicting results from national surveys. *International Journal on the Addictions*. 1992; 27:817–847.
- Haynie DL. Friendship networks and delinquency: The relative nature of peer delinquency. *Journal of Quantitative Criminology*. 2002; 18(2):99–134.
- Herd D. Sex ratios of drinking patterns and problems among Blacks and Whites: Results from a national survey. *Journal of Studies on Alcohol*. 1995; 58:75–82. [PubMed: 8979215]
- Huizinga, D.; Elliot, DS. Self-Report Measures of Delinquency and Crime: Methodological Issues and Comparative Findings. Behavioral Research Institute; Boulder, CO: 1983.
- Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the Future national survey results on drug use, 1975-2005: Volume I, Secondary school students. Bethesda, MD: NIDA; 2006. NIH Publication No. 06-5883
- Kilpatrick D, Ruggiero K, Acierno R, Saunders B, Resnick H, Best C. Violence and risk of PTSD, major depression, substance abuse/dependence, and comorbidity: Results from the National Survey of Adolescents. *Journal of Consulting and Clinical Psychology*. 2003; 71(4):692–700. [PubMed: 12924674]
- Lawrence JM, Standiford DA, Loots B, Klingensmith GJ, Williams DE, Ruggiero A, et al. Prevalence and correlates of depressed mood among youth with diabetes: the SEARCH for Diabetes in Youth Study. *Pediatrics*. 2006; 117(4):1348–1358. [PubMed: 16585333]
- Lewinsohn PM, Clarke GN, Seeley JR, Rhode P. Major depression in community adolescents: Age at onset, episode duration, and time to recurrence. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1994; 33:809–818. [PubMed: 7598758]
- Maag J, Irvin D. Alcohol use and depression among African-American and Caucasian adolescents. *Adolescence*. 2005; 40(157):87–101. [PubMed: 15861619]

- Mason WA, Hitchings JE, Spoth RL. Emergence of delinquency and depressed mood throughout adolescence as predictors of late adolescent problem substance use. *Psychology of Addictive Behaviors*. 2007; 21(1):13–24. [PubMed: 17385951]
- McCutcheon, A. *Latent Class Analysis*. Sage Publications; Beverly Hills, CA: 1987.
- Nylund KL, Asparouhov T, Muthen B. Deciding on the number of classes in latent class analysis and growth mixture modeling: A monte carlo simulation study. in press.
- Orlando M, Tucker JS, Ellickson PL, Klein DJ. Concurrent use of alcohol and cigarettes from adolescence to young adulthood: An examination of developmental trajectories and outcomes. *Substance Use and Misuse*. 2005; 40:1051–1069. [PubMed: 16040368]
- Muthen, B. *Latent variable analysis: Growth mixture modeling and related techniques for longitudinal data*. In: Kaplan, D., editor. *The SAGE Handbook of Quantitative Methodology for the Social Sciences*. Sage; Newbury Park, CA: 2004.
- Muthen, B.; Muthen, L. *Mplus User's Guide*. Muthen & Muthen; Los Angeles, CA: 1998-2004.
- Radloff LS. The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*. 1977; 1:385–401.
- Reboussin BA, Song E, Shrestha A, Lohman KK, Wolfson M. A latent class analysis of underage problem drinking: Evidence from a community sample of 16-20 year olds. *Drug and Alcohol Dependence*. 2006; 83:199–209. [PubMed: 16359829]
- Rindskopf D. Heavy alcohol use in the “Fighting Back” survey sample: separating individual and community level influences using multilevel latent class analysis. *Journal of Drug Issues*. 2006; 36(2):441–462.
- Roberts RE, Lewinsohn PM, Seeley JR. Screening for adolescent depression: A comparison of depression scales. *Journal of the American Academy of Child and Adolescent Psychiatry*. 1991; 30(1):58–66. [PubMed: 2005065]
- SAMHSA Office of Applied Studies. Results from the 2005 National Survey on Drug Use and Health: National Findings. Rockville, MD: Substance Abuse and Mental Health Services Administration; 2006. DHHS Publication No SMA 06-4194, NSDUH Series H-30
- Schulenberg J, O'Malley PM, Bachman JG, Wadsworth KN, Johnston LD. Getting drunk and growing up: Trajectories of frequent binge drinking during the transition to young adulthood. *Journal of Studies on Alcohol*. 1996; 57:289–304. [PubMed: 8709588]
- Shedler J, Block J. Adolescent drug use and psychological health: A longitudinal inquiry. *American Psychologist*. 1990; 45:612–630. [PubMed: 2350080]
- Siebenbruner J, Englund MM, Egeland B, Hudson K. Developmental antecedents of late adolescence substance use patterns. *Development and Psychopathology*. 2006; 18:551–571. [PubMed: 16600067]
- Steinhausen HC, Metzke CW. The validity of adolescent types of alcohol use. *Journal of Child Psychology and Psychiatry*. 2003; 44(5):677–686. [PubMed: 12831112]
- Stewart C, Power TG. Identifying patterns of adolescent drinking: a tri-ethnic study. *Journal of Studies on Alcohol*. 2002; 63(2):156–169. [PubMed: 12033692]
- Tarter RE, Kirisci L, Mezzich A. Multivariate typology of adolescents with alcohol use disorder. *American Journal on the Addictions*. 1997; 6:150–158.
- Udry, JR. *The National Longitudinal Study of Adolescent Health (Add Health), Waves I & II, 1994-1996; Wave III, 2001-2002* [machine-readable data file and documentation]. Chapel Hill, NC: Carolina Population Center, University of North Carolina at Chapel Hill; 2003.
- United States Department of Health and Human Services. *Healthy People 2010*. U.S. Government Printing Office; Washington, D.C.: 2000.
- Wallace JM, Muroff JR. Preventing substance abuse among African American children and youth: Race differences in risk factor exposure and vulnerability. *The Journal of Primary Prevention*. 2002; 22(3):235–261.
- Wells EA, Morrison DM, Gillmore MR, Catalano RF, Iritani B, Hawkins JD. Race differences in antisocial behaviors and attitudes and early initiation of substance abuse. *Journal of Drug Education*. 1992; 22(2):115–130. [PubMed: 1625112]

- Wiesner M, Kim HK. Co-occurring delinquency and depressive symptoms of adolescent boys and girls: A dual trajectory modeling approach. *Developmental Psychology*. 2006; 42(6):1220–1235. [PubMed: 17087554]
- Windle M. An alcohol involvement typology for adolescents: Convergent validity and longitudinal stability. *Journal of Studies on Alcohol*. 1996; 57:627–637. [PubMed: 8913994]

Glossary

Latent Class Analysis	A statistical method for organizing individuals into classes based on their patterns of responses on a set of items.
Conditional Latent Class Probabilities	Average probabilities of endorsing each response category of each observed indicator, given membership in a particular latent class.
High Risk Drinking Behaviors	Drinking behaviors associated with increased risk for severe negative consequences, such as drinking and driving, drinking at school, and drinking while carrying a weapon.

Table 1
Sample demographics for White (N = 2126) and AA (N = 822) Girls

	White	AA	Total
Age			
Age 13-15 years	44.6%	41.0%	44.0%
Age 16-19 years	55.4%	59.0%	56.0%
Family composition**			
Single-parent	20.4%	52.6%	26.3%
Two-parent	79.7%	47.4%	73.7%
Currently attending school	97.8%	98.0%	97.9%
Received psychological counseling ^ψ	15.4%	10.8%	14.5%
Attended substance abuse treatment*	2.4%	1.0%	2.1%
Mother education ^ψ			
Less than HS	12.9%	17.4%	13.7%
HS graduate or equiv	37.9%	41.7%	38.6%
Some college	21.0%	21.3%	21.0%
College grad or more	28.2%	19.7%	26.7%
Receiving public assistance**	7.4%	19.0%	9.5%

**
 $p < .01$,

*
 $p < .05$,

^ψ
 $p < .10$

Note. Column percents provided for each group. Group differences were tested using the chi-square statistic. All reported results were adjusted for the weighted sampling design of Add Health.

Table 2
Comparisons of White (N = 2126) and AA (N = 822) Girls on Study Variables

	White	AA	Total Sample
Drink alcohol past year**			
Never	51%	67%	54%
Once a month	32%	21%	30%
2-3 times a month	9%	4%	8%
Once a week or more	8%	7%	7%
Number of drinks**			
One drink	9%	11%	9%
Two or three	17%	12%	16%
Four or more	23%	10%	21%
Heavy drinking past year**			
Never	73%	88%	76%
Once a month	17%	5%	15%
More often	10%	6%	9%
Got drunk past year**			
Never	70%	87%	73%
Once a month	22%	7%	19%
More often	9%	6%	8%
Hung over/threw up			
School problem**	3%	1%	2%
Friend problem**	7%	3%	7%
Date problem**	10%	5%	9%
Parent problem**	10%	5%	9%
Regret actions**	17%	9%	15%
Regret sex**	9%	5%	9%
Serious physical fight**	19%	37%	23%
Drive while drunk**	6%	1%	5%
Drink at school**	5%	3%	5%
Carry weapon & drink			
Drink alone**	15%	11%	15%
Drink and use drugs**	12%	4%	11%
Depressive symptoms (M/SE)**	11.86 (.23)	13.50 (.45)	
Delinquency (M/SE)*	2.24 (.07)	2.54 (.13)	
Academic misbehavior (M/SE)**	-.72 (.09)	.01(.16)	

* $p < .05$,

** $p < .001$

Note. Column percents provided for each group. Group differences were tested using the chi-square statistic for categorical variables and the F-test for continuous variables. All reported results are adjusted for the weighted sampling design of Add Health.

Table 3
Estimated Conditional Probabilities by Class for Alcohol Use Indicators: White Girls
(Total N = 2126)

	Class 1: Abstainers <i>N</i> = 1063	Class 2: Experimenters <i>N</i> = 444	Class 3: Moderate Drinkers <i>N</i> = 428	Class 4: Heavy Drinkers <i>N</i> = 191
Percent of sample in each class	50.0%	20.9%	20.1%	9.0%
<u>Past Year Drinking</u>				
Never	1.00	.000	.000	.000
Once a month or less	.000	.908	.665	.045
2-3 days a month	.000	.046	.259	.359
Once a week or more	.000	.045	.076	.596
<u>Quantity</u>				
Never drank	1.00	.000	.000	.000
One drink	.000	.400	.030	.013
2-3 drinks	.000	.452	.344	.083
4 or more drinks	.000	.148	.626	.904
<u>Past Year Heavy Drinking</u>				
Never	1.00	.862	.197	.011
Once a month or less	.000	.124	.726	.078
More than once a month	.000	.014	.076	.911
<u>Past Year Got Drunk</u>				
Never	1.00	.816	.080	.000
Once a month or less	.000	.178	.873	.124
More than once a month	.000	.006	.047	.876
<u>School Problem</u>				
Never drank	1.00	.000	.000	.000
No	.000	.999	.932	.842
Yes	.000	.001	.068	.158
<u>Friend Problem</u>				
Never drank	1.00	.000	.000	.000
No	.000	.966	.805	.689
Yes	.000	.034	.195	.311
<u>Date Problem</u>				
Never drank	1.00	.000	.000	.000
No	.000	.960	.712	.601
Yes	.000	.040	.288	.399
<u>Parent Problem</u>				
Never drank	1.00	.000	.000	.000
No	.000	.938	.741	.615
Yes	.000	.062	.259	.385
<u>Regret Actions</u>				
Never drank	1.00	.000	.000	.000
No	.000	.928	.506	.377

	Class 1: Abstainers <i>N</i> = 1063	Class 2: Experimenters <i>N</i> = 444	Class 3: Moderate Drinkers <i>N</i> = 428	Class 4: Heavy Drinkers <i>N</i> = 191
Yes	.000	.072	.494	.623
<u>Hung over/Threw up</u>				
Never drank	1.00	.000	.000	.000
No to both	.000	.803	.214	.117
Yes to either or both	.000	.197	.786	.883
<u>Regret Sex</u>				
Never drank	1.00	.000	.000	.000
No	.000	.987	.738	.531
Yes	.000	.013	.262	.469
<u>Physical Fight</u>				
Never drank	1.00	.000	.000	.000
No	.000	.973	.904	.724
Yes	.000	.027	.096	.276
<u>Drive while Drunk</u>				
Never drank	1.00	.000	.000	.000
No	.000	.994	.840	.682
Yes	.000	.006	.160	.318
<u>Drink at School</u>				
Never drank	1.00	.000	.000	.000
No	.000	.987	.893	.654
Yes	.000	.013	.107	.346
<u>Carry Weapon and Drink</u>				
Never drank	1.00	.000	.000	.000
No	.000	.997	.983	.900
Yes	.000	.003	.017	.100
<u>Drink Alcohol Alone</u>				
Never drank	1.00	.000	.000	.000
No	.000	.852	.590	.496
Yes	.000	.148	.410	.504
<u>Drink and Use Drugs</u>				
Never drank	1.00	.000	.000	.000
No	.000	.972	.666	.435
Yes	.000	.028	.334	.565

Note. Fit statistics for the 4-class model were: Loglikelihood = -9.849.491; AIC = 19992.981; BIC = 20825.295; Entropy = .953. The 4-class model showed better fit than the 3-class model (LL = -10181.479; AIC = 20582.959; BIC = 21205.779; Entropy = .959) and the 5-class model (LL = -9750.513; AIC = 19869.026; BIC = 20910.833; Entropy = .924).

Table 4
Estimated Conditional Probabilities by Class for Alcohol Use Indicators: AA Girls (Total N = 822)

	Class 1: Abstainers N = 562	Class 2: Experimenters N = 191	Class3: Problem Drinkers N = 69
Percent of sample in each class	68.4%	23.2%	8.4%
<u>Past Year Drinking</u>			
Never	1.00	.000	.000
Once a month or less	.000	.822	.242
2-3 days a month	.000	.091	.232
Once a week or more	.000	.088	.526
<u>Quantity</u>			
Never drank	1.00	.000	.000
One drink	.000	.444	.112
2-3 drinks	.000	.405	.251
4 or more drinks	.000	.151	.637
<u>Past Year Heavy Drinking</u>			
Never	1.00	.877	.104
Once a month or less	.000	.087	.348
More than once a month	.000	.036	.549
<u>Past Year Got Drunk</u>			
Never	1.00	.815	.030
Once a month or less	.000	.175	.353
More than once a month	.000	.010	.617
<u>School Problem</u>			
Never drank	1.00	.000	.000
No	.000	.998	.910
Yes	.000	.002	.090
<u>Friend Problem</u>			
Never drank	1.00	.000	.000
No	.000	.959	.740
Yes	.000	.041	.260
<u>Date Problem</u>			
Never drank	1.00	.000	.000
No	.000	.946	.582
Yes	.000	.054	.418
<u>Parent Problem</u>			
Never drank	1.00	.000	.000
No	.000	.942	.617
Yes	.000	.058	.383
<u>Regret Actions</u>			
Never drank	1.00	.000	.000
No	.000	.896	.341

	Class 1: Abstainers <i>N</i> = 562	Class 2: Experimenters <i>N</i> = 191	Class3: Problem Drinkers <i>N</i> = 69
Yes	.000	.104	.659
<u>Hung Over/Threw Up</u>			
Never drank	1.00	.000	.000
No to both	.000	.770	.303
Yes to either or both	.000	.230	.697
<u>Regret Sex</u>			
Never drank	1.00	.000	.000
No	.000	.933	.628
Yes	.000	.067	.372
<u>Physical Fight</u>			
Never drank	1.00	.000	.000
No	.000	.998	.709
Yes	.000	.002	.291
<u>Drive while Drunk</u>			
Never drank	1.00	.000	.000
No	.000	.986	.916
Yes	.000	.014	.084
<u>Drink at School</u>			
Never drank	1.00	.000	.000
No	.000	.966	.749
Yes	.000	.034	.251
<u>Carry Weapon and Drink</u>			
Never drank	1.00	.000	.000
No	.000	.986	.825
Yes	.000	.014	.175
<u>Drink Alcohol Alone</u>			
Never drank	1.00	.000	.000
No	.000	.709	.551
Yes	.000	.291	.449
<u>Drink and Use Drugs</u>			
Never drank	1.00	.000	.000
No	.000	.942	.721
Yes	.000	.058	.279

Note. Fit statistics for the 3-class model were: Loglikelihood = -2563.350; AIC = 5346.701; BIC = 5864.992; Entropy = .986. The 3-class model showed better fit than the 2-class model (LL = -2891.250; AIC = 5928.499; BIC = 6272.456; Entropy = 1.00) and the 4-class model (LL = -2500.503; AIC = 5295.006; BIC = 5987.632; Entropy = .983).

Table 5
Class differences on internalizing and externalizing problems for White and AA girls

	Depressive Symptoms	Delinquency	Academic Misbehavior
	Mean (SE)	Mean (SE)	Mean (SE)
White			
Abstainers ^a	10.02 (.29)	1.44 (.08)	-1.32 (.12)
Experimenters ^b	12.13 (.43)	2.23 (.11)	-.66 (.14)
Moderate Drinkers ^c	14.54 (.57)	3.28 (.15)	.11 (.15)
Heavy Drinkers ^d	16.04 (.75)	4.65 (.24)	.91 (.25)
Group Differences	a<b,c,d b<c,d	a<b,c,d b<c,d c<d	a<b,c,d b<c,d c<d
African American			
Abstainers ^e	12.68 (.46)	1.99 (.11)	-.26 (.15)
Experimenters ^f	14.25 (.90)	2.82 (.25)	.03 (.28)
Problem Drinkers ^g	17.40 (1.2)	5.72 (.35)	1.89 (.45)
Group Differences	e<g	e<f,g f<g	e<g

Note. Group differences in means were tested using the *F* – test followed by a series of planned comparisons whereby all possible contrasts were tested. Alpha was set at .008 to control for familywise error. All analyses were adjusted for the sampling design of Add Health, and age and mother's education were controlled in all analyses.