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Reporting Bias in the Association Between Age at First Alcohol Use and Heavy Episodic Drinking

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Abstract

Background—Given the weight placed on retrospective reports of age at first drink in studies of later drinking-related outcomes, it is critical that its reliability be established and possible sources of systematic bias be identified. The overall aim of the current study is to explore the possibility that the estimated magnitude of association between early age at first drink and problem alcohol use may be inflated in studies using retrospectively reported age at alcohol use onset.

Methods—The sample was comprised of 1,716 participants in the Missouri Adolescent Female Twin Study who reported an age at first drink in at least 2 waves of data collection (an average of 4 years apart). Difference in reported age at first drink at Time 2 vs. Time 1 was categorized as 2 or more years younger, within 1 year (consistent), or 2 or more years older. The strength of the association between age at first drink and peak frequency of heavy episodic drinking (HED) at Time 1 was compared with that at Time 2. The association between reporting pattern and peak frequency of HED was also examined.

Results—A strong association between age at first drink and HED was found for both reports, but it was significantly greater at Time 2. Just over one-third of participants had a 2 year or greater difference in reported age at first drink. The majority of inconsistent reporters gave an older age at Time 2 and individuals with this pattern of reporting engaged in HED less frequently than consistent reporters.

Conclusions—The low rate of HED in individuals reporting an older age at first drink at Time 2 suggests that the upward shift in reported age at first drink among early initiates is most pronounced for light drinkers. Heavy drinkers may therefore be overrepresented among early onset users in retrospective studies, leading to inflated estimates of the association between early age at initiation and alcohol misuse.

Keywords

age at first drink; heavy episodic drinking; reporting bias

INTRODUCTION

Early age at first drink has been linked to alcohol misuse in numerous studies over the last two decades. Whether interpreted as causal or as a marker of familial risk (King and Chassin, 2007; Prescott and Kendler, 1999) or moderator of genetic liability (Agrawal et al.,

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2009), early onset alcohol use is commonly viewed as a key factor to consider in prevention efforts to reduce alcohol-related problems. Although some of the evidence for elevated rates of heavy and problem drinking among early users comes from prospective studies (Grant et al., 2001; King and Chassin, 2007; Pedersen and Skrandal, 1998; Pitkanen et al., 2005; Warner and White, 2003), a large number of investigations of this pathway of risk are based on retrospective reports (Chou and Pickering, 1992; DeWit et al., 2000; Grant and Dawson, 1997; Grant et al., 2006; Hingson et al., 2006; McGue et al., 2001; Prescott and Kendler, 1999; Vieira et al., 2007). The cost, time, and logistical challenges of conducting prospective studies spanning the periods of risk for both initiation and the development of alcohol-related problems, particularly in nationally representative samples, are such that research in this area commonly makes use of retrospective assessments. Given the weight placed on retrospective reporting of age at first drink, it is critical that its reliability be established and possible sources of systematic bias be identified.

Longitudinal studies examining stability in reports of age at drinking onset indicate that reliability is fair to poor. Using data from two panels of the National Longitudinal Survey of Youth (NLSY) collected one year apart, Prause et al. (2007) reported an intraclass correlation of 0.36 for adults and 0.19 to 0.29 for early adolescents. Bailey and colleagues (1992) found that only 27.8% of middle schoolers reported the same age at first drink one year after their first report, with over 20% reporting an age difference of 3 or more years. Results from a study conducted by Johnson and Mott (2001) that was also based on NLSY data revealed a mean absolute difference of 1.83 years in age at first alcohol use queried 2 years apart.

Across studies, the vast majority of inconsistent reporters give an older age at first use at the second point in time than at the first (Engels et al., 1997; Johnson and Mott, 2001; Labouvie et al., 1997; Parra et al., 2003; Prause et al., 2007; Shillington and Clapp, 2000). The implication for retrospective studies is that the older respondents are when asked about drinking onset, the less likely they are to report it occurring at an early age. Prospective studies of first intoxication and first alcohol use have demonstrated that those who initially report early onset show the strongest forward telescoping effects (i.e., reporting an event closer to the present than it actually occurred) (Parra et al., 2003; Shillington and Clapp, 2000). In studies using adult samples, some (but not all) of these early initiators are therefore likely to go undetected. The important question to address then becomes how consistent reporters differ from inconsistent reporters with respect to alcohol-related outcomes. Is onset of alcohol use more salient and therefore more reliably reported by those who go on to drink heavily (Labouvie et al., 1997), with those who drink more lightly misremembering (or choosing not to recall) early use? If so, then by failing to correctly classify some of the early onset *non-problem* drinkers as early initiates, retrospective studies may overestimate the associated risk for problem alcohol use.

The overall aim of the current study is to explore the possibility that the estimated magnitude of association between early age at first drink and alcohol misuse may be inflated in studies using retrospectively reported age at alcohol use onset. Toward this end, we made use of data from a longitudinal study of female adolescents followed into young adulthood and began with a simple comparison of the strength of the association between age at first drink and peak levels of heavy episodic drinking (HED) using first vs. second reports of age at first use (spaced approximately 4 years apart). We began by testing the stability of a dichotomous early use status from Time 1 to Time 2 to with the goal of evaluating the reliability of a commonly used crude indicator of early onset alcohol use. Consistency in reported age at first alcohol use across the two time points was then categorized as older age at Time 2, younger age at Time 2, and consistent reporting and group differences in frequency of HED were tested. In addition, we tested for possible associations between

consistency in reports and ethnicity, childhood maltreatment, psychiatric disorders, and other substance use.

MATERIALS AND METHODS

Participants

The sample was comprised of 1,716 female twins who participated in the Missouri Adolescent Female Twin Study (MOAFTS) and reported an age at first drink in at least 2 of the 3 waves of data collection in which lifetime drinking histories were gathered. MOAFTS is a longitudinal study of alcohol-related problems and associated psychopathology in female adolescent and young adult twins born in Missouri between 1975 and 1985. Twins were identified through birth records and recruited for the first wave of data collection between 1995 and 1999. Cohorts of 13, 15, 17, and 19 year-old female twin pairs and their families were ascertained using a cohort-sequential design. (See Heath et al. (2002) for details). Lifetime alcohol use history was queried in Waves 1, 3, and 4. Wave 3 interviews were conducted with the first 8 6-month cohorts who completed Wave 1, approximately 2 years after completion of Wave 1 interviews, to assess retest reliability of the interview. All twins from the target cohort (excluding those who had withdrawn from the study or whose parents had refused permission to re-contact the family), were contacted for Wave 4 interviews, which were conducted from 2002-2005. Mean ages at the time of Wave 1, 3, and 4 assessments were 15.5 (SD=2.4), 19.0 (SD=2.1), and 21.7 (SD=2.8), respectively. The ethnic composition of the sample used in the current analyses is 90.1% Caucasian, 9.9% African-American.

Procedure

Data were collected over the telephone by trained interviewers. At baseline, a screening to determine zygosity of the twin pair was conducted with one of the twins' parents and a parental diagnostic interview was scheduled. Interviews with twins were scheduled after obtaining verbal consent (and, for those under the age of 18, consent of parents), as approved by the IRB at Washington University. Wave 3 and 4 assessments were also conducted over the telephone after obtaining verbal consent.

Assessment Battery

Data were collected with an interview modified for telephone administration from the Semi-Structured Assessment for the Genetics of Alcoholism (SSAGA/SSAGA-II) (Bucholz et al., 1994; Hesselbrock et al., 1999), which was designed to assess alcohol use disorders and related psychiatric conditions. The SSAGA was used to obtain histories of alcohol and other substance use, gather information about the early home environment, and obtain DSM-IV diagnoses.

Age at First Drink—Lifetime (any) alcohol use was assessed by asking respondents if they had ever had a full alcoholic drink, defined for the respondent as a standard can or bottle of beer, a glass of wine, or a shot of liquor. 'No' responses were followed up with, 'So you've never had even one drink of alcohol?' Participants who endorsed alcohol use were asked how old they were when they had their very first full drink. Only a small fraction of participants who reported an age at first drink in a given assessment denied having had a full drink of alcohol in the next wave of data collection (0.7-3.5%).

Sources of first and second reports were as follows: 39.0 % Waves 1 and 3; 40.4% Waves 1 and 4; 20.5% Waves 3 and 4. Mean age was 17.3 (SD = 2.1) years at Time 1 and 21.5 (SD = 2.7) years at Time 2. When three reports were available (which was the case for 35.0% of participants with greater than 1 report), the first two were used. This approach (as opposed

to conducting analyses with Wave 1 and 4 reports for all participants, for example) allowed us to maintain the largest possible sample size while drawing uniformly on first and second reports. To account for the variation in the pairings of assessments, lag time between reports (mean=4.3 years; SD=1.8) was included as a covariate in analyses.

Operationalizing Consistency in Report of Age at First Drink—Age at first drink reported at Time 1 was subtracted from age reported at Time 2 to create a difference score. Based on difference scores, which ranged from -8 to 15, participants were categorized into one of 3 groups. Per Wittchen et al. (1989), we defined consistent reporting as no more than a 1 year age difference between Time 1 and Time 2 reports. (A total of 525 respondents reported the same age at both time points.) Group 1 consisted of individuals reporting an age at first drink 2 or more years younger at Time 2 than at Time 1 (n=104; 6.1%). Group 3 was comprised of individuals reporting an age at first drink 2 or more years older at Time 2 than at Time 1 (n=520; 30.3%). Group 2 was consistent reporters (n=1,092; 63.6%).

Frequency of Heavy Episodic Drinking in Period of Heaviest Alcohol Use—Participants who reported consuming alcohol on at least 6 occasions (94.1% of the sample) were asked about the frequency with which they had consumed 5 or more drinks in a single day (i.e., engaged in HED) during the previous 12 months. Fourteen possible responses were presented, ranging from 'never' to 'every day.' For the current study, responses were collapsed into 5 categories: never, 1-11 days per year, 1-3 days per month, 1-3 days per week, and 4 or more days per week. If participants responded 'yes' to the question, 'Was there ever a period of 12 months or longer when you drank more than you did in the past 12 months?' HED was queried for that period. Frequency of HED in the heaviest period of use was coded as the higher of the two values from these questions for a given wave of data collection. Analyses were conducted with the maximum frequency reported across the 2 time points.

Childhood and Adolescent Risk Factors for Heavy Alcohol Use and Problem Drinking—Consistency in report of age at first drink was examined with respect to several well-established childhood and adolescent risk factors for alcohol misuse: childhood maltreatment (Dube et al., 2006; Galaif et al., 2001; Hussey et al., 2006), conduct disorder (King et al., 2004; Kuperman et al., 2005; McGue et al., 2001), major depressive disorder (Dawson et al., 2005; Grant et al., 2004; Hasin et al., 2007; Kessler et al., 1996), regular smoking (Cardenal and Adell, 2000; Dawson, 2000; Grucza and Bierut, 2006; Johnson et al., 2000), and cannabis abuse (Degenhardt et al., 2002; Grant and Pickering, 1999; Stinson et al., 2006). Respondents who endorsed criteria at either Time 1 or Time 2 were counted as positive for a given risk factor. Childhood physical abuse or neglect (CPAN) and childhood sexual abuse (CSA) were assessed in multiple sections of the interview. Individuals were coded as positive for CPAN if, in the traumatic events section, they reported experiencing physical abuse or serious neglect before the age of 16; in the early home environment section they reported that between the ages of 6 and 12 they were purposely physically injured by an adult or often punched or hit with a belt or stick by either parent or if they endorsed either 'non-physical, harsh (lock in closet, deprive of food)' or 'physical harsh (use weapon, punch, whip)' as the usual means of punishment by either parent between the ages of 6 and 12. Participants were coded as positive for CSA history if, in the traumatic events section, they reported that before the age of 16 they were raped or sexually molested; in the early home environment section they endorsed forced sexual contact prior to age 16 with a family member or another adult 5 or more years older; or in the sexual maturation section they reported being forced to have sexual intercourse before age 16. In Waves 1 and 3, regular smoking was defined as smoking greater than 20 cigarettes (lifetime) and smoking at least once a week for 3 weeks or longer. In Wave 4, the minimum quantity was also 21

cigarettes, but minimum duration of weekly smoking was 2 months. (A lower threshold than the standard 100 cigarettes used with adult samples was chosen given the substantial number of participants who were under the age of 18 when smoking behaviors were first assessed. This intensity of smoking is associated with loss of control over smoking, ND, and withdrawal in young smokers [DiFranza et al., 2007]). Diagnoses of conduct disorder, cannabis abuse, and major depressive disorder were based on DSM-IV criteria.

Data Analysis

Descriptive statistics and correlations were calculated in SAS, version 8.2 (SAS Institute, Inc., 2001). Regression analyses were conducted in Stata, version 9.2 (Statacorp, 2007), with confidence intervals adjusted for family clustering using Huber-White robust standard errors.

Consistency in Reports of Age at First Drink—The correlation between Time 1 and Time 2 age at first drink reports was calculated using the raw (continuous) data after removing extreme outliers (the highest and lowest 1% of the range of Time 2-Time 1 difference scores). As a second approach to assessing consistency in reports, specifically, consistency in categorization of drinkers as early vs. non-early initiators, a dichotomous variable representing early use was created, with the lowest one-third of the distribution of age at first drink in Time 1 reports (14 years or younger) coded positive and the remainder ('average to late' first users) as negative for early use. A tetrachoric correlation coefficient was calculated to determine consistency of early initiation status across time points (using the same definitions at Time 1 and Time 2).

Consistency in Reports and Childhood/Adolescent Risk Factors—The associations between consistency in age at first drink reports and each of the risk factors for alcohol misuse as well as ethnicity were tested in a series of multinomial logistic regression analyses. Adjustments were made in the models for the lag time between Time 1 and Time 2 reports.

Age at First Drink and Heavy Episodic Drinking: Time 1 vs. Time 2 Reports—To establish the association between reported age at first drink and maximum frequency of HED, two ordinal logistic regression analyses were conducted, the first using onset age reported at Time 1 and the second using onset age reported at Time 2 to predict HED. A pairwise comparison of the resulting odds ratios was then conducted to determine whether the strength of the association between age at first drink and HED varied by use of Time 1 vs. Time 2 reports.

Consistency in Reports and Heavy Episodic Drinking—A multinomial logistic regression analysis was conducted to test for the association between consistency in reporting age at first alcohol use and frequency of HED during the period of heaviest alcohol use (adjusting for lag time between Time 1 and Time 2 reports). Statistically significant covariates identified in individual multinomial regression analyses (ethnicity, CSA, CPAN, major depressive disorder, regular smoking, and cannabis abuse) were then added to the model to adjust for the potential effects of these risk factors on the association between consistency in report and HED.

RESULTS

Consistency in Reports of Age at First Drink and Categorization as an Early Initiator

At Time 1, mean reported age at first alcohol use was 15.07 (SD=2.18) years; at Time 2, it was 16.01 (SD=2.23). The correlation between Time 1 and Time 2 reports of age at first drink was 0.65 ($p<0.0001$).

Consistency between Time 1 and Time 2 in categorization as an early (vs. average to late) initiator of alcohol use is reported in Table 1. Although the tetrachoric correlation was in the moderate range ($r=0.65$), it is evident from the table that the association is driven by the high consistency among average to late onset users. Over 90% of individuals reporting at Time 1 that they began drinking at 15 years of age or older also reported initiating alcohol use at age 15 or later at Time 2. By contrast, fewer than half of the participants who reported onset of alcohol use before age 15 at the first assessment reported an onset age younger than 15 years at Time 2.

Age at the time of first interview varied across reporting groups ($F_{(2, 1713)} = 78.30$; $p<0.001$). Mean age was lowest for Group 3 ($M=16.36$; $SD=2.23$), followed by Groups 2 ($M=17.60$; $SD=2.07$) and 1 ($M=18.33$; $SD=2.04$).

Association of Consistency in Reports with Ethnicity and Childhood/ Adolescent Risk Factors

As seen in Table 2, consistency in reported age at first drink differed significantly by ethnicity. At Time 2, half of the African-American participants reported initiating alcohol use 2 or more years later than they reported at Time 1, compared with only 28.1% of Caucasians. Rates of several risk factors for alcohol misuse also varied across classes of reporters. Prevalence of CSA was elevated in Group 1 ($RRR=2.15$; $CI: 1.23-3.74$), as was cannabis abuse ($RRR=2.41$; $CI: 1.28-4.53$). Rates of major depressive disorder and regular smoking were lower for Group 3 compared with Group 2 (consistent reporters) ($RRRs=0.72$ [$CI: 0.57-0.92$] and 0.75 [$CI: 0.60-0.93$], respectively), but higher for CPAN ($RRR=1.36$; $CI: 1.06-1.74$).

Age at First Drink and Heavy Episodic Drinking: Time 1 vs. Time 2 Reports

Both Time 1 and Time 2 reports of age at first drink were significant predictors of maximum frequency of HED, with earlier age being associated with more frequent HED. The odds ratios for Time 1 and Time 2 reports were 0.87 ($CI: 0.84-0.91$) and 0.76 ($CI: 0.72-0.79$), respectively. A pairwise comparison revealed that although the association was significant for both reports, it was stronger for Time 2 than Time 1 reports ($\chi^2_{(1)}=32.70$; $p<0.001$).

Consistency of Reporting and Heavy Episodic Drinking

Frequency of HED during the period of heaviest alcohol use is shown by consistency in age at first drink reports in Figure 1. One in 4 individuals reporting an older age at Time 2 never engaged in HED during their heaviest drinking periods, compared with one in 8 consistent reporters. An additional 26.6% reported having done so less than once a month. Results of the initial multinomial logistic regression analysis revealed statistically significantly lower rates of HED in this group. Relative risk ratios, using consistent reporters as the comparison group, ranged from 0.27 – 0.55 (with confidence limits below 1.0 for all categories of frequency). Individuals reporting a younger age at Time 2 did not differ significantly from consistent reporters in their frequency of HED.

Table 3 shows the results of the multinomial logistic regression incorporating significant covariates from univariate analyses (ethnicity, CSA, CPAN, major depressive disorder,

regular smoking, and cannabis abuse) to test the association between consistency in report of age at first drink and frequency of HED. After adjusting for relevant covariates, the pattern observed in the initial regression analysis remained. Compared to consistent reporters, individuals reporting an older age at Time 2 (Group 3) engaged significantly less frequently in HED during the heaviest drinking period, whereas frequency of HED for those reporting a younger age at Time 2 (Group 1) did not differ from that of consistent reporters. In the context of the full model, CSA and cannabis abuse remained elevated in Group 1 and the association of African-American ethnicity with older age at Time 2 report remained significant.

DISCUSSION

Building on the literature linking early alcohol use to risky and problem drinking - much of which depends on retrospective reports - we examined the association between consistency in reported age at first drink and frequency of HED during the period of heaviest drinking. The two patterns of inconsistent reporting were characterized with respect to ethnicity, childhood maltreatment, psychiatric conditions, and other substance use. Although ethnicity and other demographic factors have been examined in relation to stability in alcohol onset reports (Johnson and Mott, 2001; Prause et al., 2007; Shillington and Clapp, 2000), ours is among the first to explore childhood and adolescent risk factors and to test the association between stability of age at first drink report and alcohol misuse.

Reported age at first drink was somewhat more stable in our sample than in prior studies (Bailey et al., 1992; Labouvie et al., 1997; Prause et al., 2007; Shillington and Clapp, 2000), with a Pearson correlation of 0.65 between the 2 reports and nearly two thirds of participants' Time 2 reports differing by 1 year or less from Time 1 reports. However, stability of (dichotomous) early onset status was poor, with 56% of those initially classified as early users no longer reporting first drink prior to age 15 in their second reports. These findings suggest that results from studies classifying age at onset simply as early vs. non-early should be interpreted with caution, given the instability of such dichotomous classifications. In contrast to the large number of participants shifting from early status at Time 1 to non-early status at Time 2, only 8.8% followed the reverse pattern, providing further support for elevated rates of this upward shift in reported age at first drink among early onset drinkers (Parra et al., 2003; Shillington and Clapp, 2000).

The greater degree of inconsistency in age at first drink reports among African-Americans compared with Caucasians in our sample was also documented by Johnson and Mott (2001). One hypothesis worth examining is that the high rates of upward shifts in reported age is related to the older age at first use among African-Americans (National Institute on Alcohol Abuse and Alcoholism, 2006; Rothman et al., 2009). When early initiators are asked to recall age onset, they may revert to norms among their same-ethnicity peers. For African-Americans, the larger gap between (non ethnicity-specific) early onset and average age at first drink among their African-American peers may translate into greater upward shifts in reported age at first alcohol use.

Distinctions between patterns of inconsistent reporting (i.e., older vs. younger age at subsequent reports) are rarely made in the literature, but our results indicate that the two patterns differ with respect to relevant childhood and adolescent risk factors. Compared with consistent reporters, elevated rates of CSA and cannabis abuse were observed in individuals reporting a younger age at Time 2, but not in those reporting an older age at Time 2. Conversely, older age at second report was associated with increased likelihood of endorsing CPAN and decreased likelihood of endorsing major depressive disorder and regular smoking, but the prevalences of these conditions in those reporting a younger age at Time 2

were comparable to those of consistent reporters. Given the lack of literature in this area, we can only speculate on why these two types of inconsistent reporting are differentially associated with the risk factors we examined. One possible explanation for the decreased rates of major depressive disorder and regular smoking in Group 3 is that both conditions are associated with problem drinking, which we know to be lower in those reporting an older age at Time 2. The association of CSA and cannabis abuse with younger age at second report may reflect a tendency for individuals who have experienced childhood maltreatment and/or abused substances to be poor historians (but why the same pattern is not observed for CPAN as for CSA is unclear). Although we cannot yet explain these patterns, it may be possible to apply this information to make statistical adjustments for systematic biases in retrospectively reported age at initiation of alcohol use.

The most significant contribution from this study to the early drinking onset literature is our finding that individuals who reported an age at first drink 2 or more years older at the second than the first assessment engaged in HED less frequently than consistent reporters. The implication is that an analysis of the association between HED and age at first alcohol use making use of Time 2 reports of age at first drink would lead to an underestimation of the number of early initiators and, even more importantly, those early initiators that were 'lost' would likely be lighter drinkers. The result would be an overrepresentation of heavy drinkers among those reporting an early age at first drink. As seen in our comparison of analyses conducted with Time 1 and Time 2 age onset reports, this bias in reporting age at drinking onset can lead to inflated estimates of the association between early use and risky or problem drinking. By no means do we conclude (based either on our own data or on prior studies in this area) that the risk for alcohol misuse associated with early drinking is purely a methodological artifact. The link between early alcohol use and alcohol-related problems has been demonstrated in many prospective studies (Grant et al., 2001; King and Chassin, 1999; Pedersen and Skrandal, 1998; Pitkanen et al., 2005; Warner and White, 2003) and should remain a focus for etiological and prevention research. What our data indicate is that fewer early initiates go on to develop problem drinking behaviors than is typically reported in retrospective studies. We hope that this finding will encourage investigation into factors that protect against risk for alcohol-related problems in those who begin drinking at a young age.

A number of possible explanations for the upward shift in reported age of onset in subsequent reports of event have been proposed and may serve as a guide for improving measurement of age at first drink in retrospective studies. For example, the potential for social desirability to lead to revising alcohol use history to fit more with perceived norms (Parra et al., 2003) could be addressed by emphasizing the wide range in age at onset of alcohol use in the population when querying early drinking behaviors. Forgetting a relatively isolated first drinking event that may have been more memorable early on in drinking course or changing the definition of alcohol use onset with increasing age (Bailey et al., 1992; Engels et al., 1997) could be minimized by encouraging respondents to recall details about the context of first alcohol use such as where and with whom they were drinking.

Limitations and Future Directions

The current study makes an important step toward understanding the role of retrospective recall bias in characterizing risk for heavy or problem drinking associated with early onset alcohol use and suggests several possible directions for future research. First, our sample is all female and the evidence for gender differences in reliability of age at drinking onset is mixed (Johnson and Mott, 2001; Prause et al., 2007; Shillington and Clapp, 2000), so the generalizability of findings to men is not yet known. Second, we measured age at first drink at two time points. Longitudinal studies with a larger number of waves of data collection would offer the opportunity to test the relationship between consistency and drinking

behaviors across larger intervals and to detect possible within-individual changes in the association over time. Third, exploration of associations between risky drinking behaviors and other retrospectively reported measures of alcohol use onset, such as age at first intoxication and age onset of regular drinking, would provide important information about the utility of alternate measures that may be affected less than age at first drink by retrospective reporting bias. Finally, the approach taken here can be applied to reports of first tobacco and cannabis use, which, like age at first drink, are associated with problem use (Anthony and Petronis, 1995; Everett et al., 1999; Grant and Dawson, 1998; Hu et al., 2006; King and Chassin, 2007) and are subject to forward telescoping (Bailey et al., 1992; Engels et al., 1997; Johnson and Mott, 2001; Labouvie et al., 1997; Parra et al., 2003; Shillington and Clapp, 2000).

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Figure 1.

TABLE 1

Consistency across reports in categorization as early initiator of alcohol use

Time 1	Time 2	
	Early n=377	Average to Late n=1,339
Early ($\leq$ age 14) n=643	16.5% (n=283)	21.0% (n=360)
Average to Late ($\geq$ age 15) n=1,073	5.5% (n=94)	57.0% (n=979)

TABLE 2

Ethnicity, childhood abuse, psychiatric disorders, and other substance use by consistency in report of age at 1st drink^a

	Reporting Patterns		
	Younger Age at Time 2 ^b n=104 (6.1%)	Consistent ^c n=1,092 (63.6%)	Older Age at Time 2 ^d n=520 (30.3%)
Ethnicity: distribution across classes			
African-American (n=170)	7.7%	41.8%	50.6%
Caucasian (n=1,546)	5.9%	66.4%	28.1%
<i>RRR [95% CI]</i>	2.01 [1.04 – 3.91] *	-----	2.74 [1.91 – 3.95] *
Prevalence of risk factors within each class			
Childhood sexual abuse (n=217)	22.1%	11.3%	13.8%
<i>RRR [95% CI]</i>	2.15 [1.23 – 3.74] *	-----	1.14 [0.83 – 1.57]
Childhood physical abuse or neglect (n=364)	27.9%	19.1%	24.5%
<i>RRR [95% CI]</i>	1.50 [0.95 – 2.38]	-----	1.36 [1.06 – 1.74] *
Major depressive disorder (n=492)	36.5%	29.9%	24.6%
<i>RRR [95% CI]</i>	1.32 [0.87 – 2.00]	-----	0.72 [0.57 – 0.92] *
Conduct disorder (n=55)	2.9%	3.8%	2.2%
<i>RRR [95% CI]</i>	0.72 [0.21 – 2.44]	-----	0.53 [0.27 – 1.03]
Regular smoking (n=858)	55.8%	51.4%	46.0%
<i>RRR [95% CI]</i>	1.15 [0.75 – 1.78]	-----	0.75 [0.60 – 0.93] *
Cannabis abuse (n=100)	13.5%	6.0%	3.9%
<i>RRR [95% CI]</i>	2.41 [1.28 – 4.53] *	-----	0.62 [0.37 – 1.04]

^a adjusting for lag time between Time 1 and Time 2 reports

^b 2 or more years younger age reported at Time 2 vs. Time 1

^c age reported at Time 2 within 1 year of age reported at Time 1

^d 2 or more years older age reported at Time 2 vs. Time 1

* p<0.05

TABLE 3

Association between consistency in reporting age at first drink and frequency of heavy episodic drinking in period of heaviest alcohol use, adjusting for significant covariates^a

	RRR [95% CI]	
	Younger age at Time 2	Older age at Time 2
Frequency of heavy episodic drinking ^b		
Less than once/month (1 – 11 times/year)	1.39 [0.69 – 2.82]	0.62 [0.44 – 0.87]*
1 - 3 days/month	1.13 [0.54 – 2.38]	0.49 [0.34 – 0.70]*
1 - 3 days/week	1.02 [0.50 – 2.11]	0.32 [0.22 – 0.47]*
4 or more days/week	1.28 [0.50 – 3.26]	0.44[0.25 – 0.76]*
African-American ethnicity	2.01 [0.99 – 4.05]	1.96 [1.27 – 3.04]*
Childhood sexual abuse	1.89 [1.05 – 3.42]*	1.02 [0.70 – 1.47]
Childhood physical abuse or neglect	1.16 [0.69 – 1.96]	1.20 [0.90 – 1.60]
Major depressive disorder	1.03 [0.66 – 1.61]	0.78 [0.59 – 1.03]
Regular smoking	1.02 [0.63 – 1.65]	1.11 [0.86 – 1.43]
Cannabis abuse	2.02 [1.04 – 3.94]	0.66 [0.37 – 1.17]

^a adjusting for lag time between Time 1 and Time 2 reports

^b using never engaged in HED as the comparison group

*
p<0.05