



Published in final edited form as:

Prev Sci. 2014 February ; 15(1): 115–124. doi:10.1007/s11121-012-0360-8.

Differential Evaluations of Alcohol-related Consequences Among Emerging Adults

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Abstract

Personalized feedback interventions (PFIs) to reduce drinking in college students often provide feedback about negative alcohol-related consequences experienced by students to motivate them to drink less. Yet, there is evidence which suggests that not everyone perceives consequences as negative and raises questions regarding the utility of consequence-specific feedback for some individuals. The purpose of the current study was to extend this research to examine salience of consequences among both college and non-college emerging adults, differences in ratings by sex, age, and frequency of experiencing consequences, and the relationship between salience measured in emerging adulthood and drinking patterns in young adulthood. Data were from an accelerated cohort study of males and females ($N = 1308$), who were either age 18, 21, or 24 years at the time of consequence evaluation and followed up 7 years later. Most experienced consequences were rated as at least a little bothersome. Regression analyses indicated that females, older participants, and those who experienced a consequence more often evaluated consequences as more bothersome but there were no differences by college status. Mean ratings of bother did not predict quitting drinking or alcohol problems 7 years later, whereas the number of consequences experienced did. Overall, the results suggest that most consequences are rated similarly by emerging adults regardless of college attendance but that feedback on consequences may be more salient for females and older emerging adults. PFIs may need to differ in the types of feedback they provide depending on demographic characteristics and baseline level of alcohol problems.

Keywords

alcohol; consequences; emerging adults

Excessive drinking among emerging adults can result in numerous problems, such as brain impairment, accidents, violence, and unsafe sexual behavior (White & Rabiner, 2012), highlighting the need for interventions to reduce alcohol use and related harm. One efficacious type of brief intervention for this age group, used particularly with college students, is personal feedback interventions (PFIs). PFIs often provide feedback about individuals' patterns of drinking in relation to their peers and the negative consequences they experience as a result of their drinking (Carey, Scott-Sheldon, Carey, & DeMartini, 2007; Crouce & Larimer 2012; White, 2006). These interventions are based on the hypothesis that, after receiving feedback about their problematic drinking, individuals will be motivated to drink less to avoid such consequences. Recent research suggests, however, that not all youth evaluate some negative consequences as "negative" (Lee, Maggs, Neighbors, & Patrick, 2011; Mallett, Bachrach, & Turrisi, 2008; Patrick & Maggs, 2011). For example, Mallett et al. (2008) gave students a list of 16 frequently experienced negative

consequences and not one was unanimously rated as negative by all students. In fact, one-fourth of the students who experienced hangovers rated them as positive as did 12% who experienced a blackout. Therefore, feedback about certain consequences may not be salient for some individuals and thus may have no positive effect or even an iatrogenic effect (Lee, Neighbors, Lewis, Tollison, & Larimer, 2010).

To date, most of the limited research on the salience of consequences has been conducted on college students (e.g., Gaher & Simons, 2007; Lee et al., 2010, 2011; Mallett et al., 2008; Patrick & Maggs, 2011). Given that heavy drinking increases during emerging adulthood regardless of college attendance (White, Labouvie, & Papdaratsakis, 2005), it is important to understand how both college students and their non-college peers experience and perceive consequences of drinking. In addition, much of the research on negative consequences and their salience has been cross-sectional (e.g., Gaher & Simons, 2007; Mallett et al., 2008), and the few longitudinal studies that have been conducted have followed students only over a short window of time (e.g., Lee et al., 2010; Merrill, Read, & Barnett, 2012; Patrick & Maggs, 2011). Using a community sample of emerging adults, this study extends prior research and examines which consequences are rated as most troublesome, whether ratings differ by college status, age, sex, and the experience of negative consequences, and whether evaluations of consequences during emerging adulthood predict drinking patterns and problems in young adulthood.

Effects of PFIs on Alcohol-related Problems

Numerous evaluations of PFIs have been conducted and, for the most part, PFIs have been found to be efficacious in reducing harmful drinking patterns (heavy episodic drinking, peak blood alcohol concentrations, peak alcohol use quantities, and/or total number of drinks consumed per week) at least on a short-term basis (for reviews, see Carey et al., 2007; Crouce & Larimer, 2011; Walters & Neighbors, 2005; White, 2006). Findings have been much less consistent regarding the effect of PFIs on reducing alcohol-related problems. Some studies have found moderate to strong reductions in alcohol problems (e.g., Marlatt, Baer, Kivlahan, Dimeff, Larimer, Quigley, Somers, & Williams, 1998; Murphy, Benson, & Vuchinich, 2004; White, Mun, Pugh, & Morgan, 2007; White, Mun, & Morgan, 2008), whereas other studies have found no significant reductions (e.g., Borsari & Carey, 2000; Larimer et al., 2007; Larimer, Turner, Anderson, Fader, Kilmer, Palmer, & Crouce, 2001). Not all PFIs, however, include feedback about negative consequences and this lack of focus on personal consequences may account for the lack of positive results in some studies (Collins, Carey, & Sliwinski, 2002). Nevertheless, several of the evaluations that reported no reductions in alcohol problems have included lists of negative consequences experienced by the student in their feedback forms (e.g., Larimer et al., 2001, 2007).

Another potential explanation for the lack of positive effects of PFIs on alcohol problems may have to do with students' interpretations and evaluations of consequences. That is, although researchers and clinicians may assume that experiencing a negative consequence (e.g., a blackout) is a bad experience, recent research suggests that there are individual differences in evaluations of consequences (Mallett et al., 2008). Therefore, differences in evaluation can affect the salience of the intervention message for students, which in turn can affect the student's motivation to change his or her drinking behavior.

Evaluations of and Effects of Experiencing Consequences

From a social learning perspective, the consequences that youth experience as a result of drinking are expected to serve as reinforcers of future drinking expectancies, motivations and behaviors (Lee et al., 2011). Furthermore, social learning theory suggests that people make decisions by weighing the potential positive and negative outcomes of engaging in

specific behaviors (Lee et al., 2010). Thus, individuals are expected to try to avoid experiences that are deemed as unpleasant (Mallett et al., 2008). However, a question often faced by counselors working with heavy drinking students (as well as addiction counselors in general) is why individuals continue to drink despite experiencing negative consequences. Recent research has begun to examine this question directly by examining the types of consequences that students experience and how they evaluate those consequences.

Recent studies indicate that there is large individual variation in college students' ratings of drinking consequences. Those students who rate consequences more positively are more likely to drink heavily than their peers who rate consequences more negatively (Gaher & Simons, 2007; Mallett et al., 2008). Although these cross-sectional studies indicate that students' evaluations of alcohol-related consequences are associated with their drinking behavior, they cannot assess whether individual differences in evaluations are the result of or cause of differences in drinking behavior.

The few longitudinal studies of consequence evaluations have been diary studies (e.g., Lee et al., 2010; Merrill et al., 2012; Patrick & Maggs, 2011) and have followed students over a few semesters at most. These studies have shown that students who rate consequences as more positive and less negative are more likely to report heavy drinking and alcohol-related problems at a later point (Patrick & Maggs, 2011). For example, Merrill and colleagues (2012) found that on weeks when students had more negative ratings of consequences, they drank less and experienced less harm the following week. Patrick and Maggs (2008) found that week-to-week fluctuations in experiencing negative consequences were not associated with plans to drink or ratings of the importance of experiencing negative consequences in the short term (i.e., the following week). Overall, students experienced more positive than negative consequences and these positive consequences influenced future drinking more than their negative consequences. Results from Lee and colleagues (2010) indicated that students experienced more positive and more negative consequences on those days on which they consumed more drinks (see also Lee et al., 2011). Those who drank more also rated their drinking experience as more positive than those who drank less. Within-subjects analyses indicated that experiencing more positive consequences and less negative consequences was associated with a more positive evaluation of the drinking day (see also Logan, Henry, Vaughn, Luk, & King, 2011).

In summary, the research indicates that students evaluate consequences differently than researchers and that students continue to drink despite experiencing "negative" consequences. Logan et al. (2011) suggested that students who experience negative consequences frequently may perceive them as less severe and thus drink more on subsequent drinking occasions, leading these students to experience more negative consequences in the future. However, little longitudinal research has examined the associations between both experiencing and evaluating consequences and later drinking behavior to tease apart these temporal issues. Furthermore, no studies have investigated these issues with emerging adults who do not attend college. As stated above, the sole focus of this research area on college students ignores an important group of emerging adults, who, compared to college students, may be at higher risk for later alcohol problems because they are less likely to mature out of heavy drinking as they transition to adulthood (Muthén & Muthén, 2000; White et al., 2005). Also, to our knowledge, no studies have examined developmental differences in the evaluation of consequences. Finally, findings have been mixed about whether there are sex differences in the experience and evaluation of consequences. Patrick and Maggs (2008) found no sex differences in whether students experienced negative consequences, and Mallett et al. (2008) found no differences in evaluations of negative consequences. In contrast, Logan et al. (2011) found that females

evaluated consequences more positively than males, whereas Gaher and Simons (2007) found the opposite.

Current Study

The data for this study come from an accelerated cohort, longitudinal, community sample of men and women who were followed from emerging adulthood into young adulthood. Thus, this sample allows us to expand prior research in several ways. The purpose is to examine which negative consequences are rated most troublesome by emerging adults and whether there are differences in ratings (i.e., salience) by sex, age, the frequency of experiencing consequences, and college status. We also examine whether ratings of consequences during emerging adulthood predict later drinking patterns and alcohol-related problems in young adulthood. In this study we use three different cohorts to examine whether evaluations of negative consequences vary from early emerging adulthood (age 18) to middle (age 21) and later (age 24) emerging adulthood and whether these ratings affect drinking patterns and problems 7 years later.

Based on the hypothesis that youth who experience negative consequences frequently may become “immune” to them, we predict that individuals who experience consequences less, compared to more, frequently will rate them as more bothersome, that younger participants will rate consequences as more bothersome than older participants, and that women will rate consequences as more bothersome than men. In addition, consistent with the short-term diary studies (i.e., Merrill et al., 2012; Patrick & Maggs, 2011), we predict that those emerging adults who rate consequences as more bothersome will be less likely to drink at all, as well as less likely to drink frequently and to experience problems in young adulthood, than those who rate them as less bothersome. Because there is no research to guide a hypothesis about college students versus nonstudents, we treat this comparison as exploratory.

Method

Design and Sample

The data come from the Rutgers Health and Human Development Project (HHDP), a prospective longitudinal study of adolescent and young adult development (Pandina, Labouvie, & White, 1984). Eligible adolescents were recruited through a random telephone survey of households in New Jersey. At the time of recruitment, this procedure was estimated to reach about 95% of individuals living within a specific geographic area (Horwitz & White, 1991). Successive rounds of telephone calls were carried out between 1979 and 1981 to meet specified quotas of 200–225 males and females aged 12, 15, or 18. First, an anonymous interview was used to identify households with eligible adolescents and to obtain demographic information. Next, field interviewers visited prospective participants in their homes to gather additional demographic information and obtain written consent from parents and assent from children. Participants then came to campus where they completed several questionnaires and test batteries. The initial study and all follow ups were approved by the university human subjects committee. From age 18 on, participants signed written consent forms.

Demographic comparisons of nonparticipants and participants on variables obtained in the initial telephone interview indicated that participants reported higher levels of family income and parental education, compared to those who refused to participate. Nevertheless, the sample was heterogeneous and similar to the New Jersey population at the time it was recruited in terms of family income and religion (U.S. Bureau of Census, 1981). This sample is most representative of white, working- and middle-class youth living in a metropolitan

area of the Northeastern U.S. (for more detail on the sample and design, see Pandina et al., 1984.) Patterns of substance use in this sample were comparable to those reported in national representative samples for same age peers living in the Northeast region of the U.S. at the time of data collection (Johnston, O'Malley, Bachman, & Schulenberg, 2012).

Participants were interviewed initially between 1979 and 1981 (Time 1, T1) at the ages of 12, 15, and 18, representing the youngest, middle, and oldest cohort, respectively (N=1380). They returned three years later in 1982–1984 (Time 2, T2), again in 1985–1987 (Time 3, T3), and again in 1992–94 (Time 4, T4). Ninety-one percent of the original participants returned at T4. Participants were compensated \$125 at T4 for spending a day at the lab. A comparison between those participants who were retested at T4 and those who dropped indicated that attrition was higher for male and older participants. However, controlling for age, there were no significant differences in alcohol measures at T1 (frequency of drinking, quantity of drinking, times high on alcohol, or alcohol problems) for those who were retested at T4 and those who dropped out.

For the present analyses we focus on the sample at T3, which was the only assessment at which participants rated the salience of the negative consequences that they experienced. At that time, the youngest cohort was age 18, middle was age 21, and oldest was age 24 (N=1308). We also include data from T4, 7 years later, when participants were ages 25, 28, and 31, respectively. The sample is limited to those youth who were drinkers at T3 (N=1161).

Measures

Negative consequences—The list of negative consequences came from the Rutgers Alcohol Problem Index (RAPI, White & Labouvie, 1989). The RAPI assesses the frequency of experiencing 23 consequences while drinking or because of one's drinking, and is often used in PFIs as the basis for providing feedback to students on their negative consequences (e.g., Marlatt et al., 1998; White et al., 2007, 2008). Internal (alphas > .8) and test-retest reliability, as well as discriminant and construct validity in both general population and clinical samples of adolescents and young adults have been widely demonstrated (Miller, Neal, Roberts, Baer, Cressler, Metrick, & Marlatt, 2002; White, Filstead, Labouvie, Conlin, & Pandina, 1988; White & Labouvie, 1989, 2000; White et al., 2005). In the current study, three RAPI items were not assessed at T3, so the T3 list of consequences is based on 20 items (see Table 1; items excluded from the original RAPI were “tried to cut down or quit,” “had a fight, an argument or bad feelings with a friend,” and “had a fight, an argument or bad feelings with a family member”). At T3 drinkers were asked how often they experienced each of these 20 items in the last 3 years on a 4-point scale (0 = never, 1 = 1–2 times, 2 = 3–5 times, 3 = 6+ times) and, for each consequence that they experienced, they were asked to rate how bothersome it was on a 4-point scale (1 = not at all, 2 = a little, 3 = somewhat, 4 = very bothersome).

A T3 RAPI frequency score was computed as the sum of frequencies across all consequences (average alpha across cohorts = .89) and a T3 RAPI count score was computed as the total number of negative consequences experienced. The reliability and validity of the dichotomized RAPI has been established among college students (Martens, Neighbors, Dams-O'Connor, Lee, & Larimer, 2007). In addition, a T3 bother score was created as the mean across all the bother scores for the separate consequence items experienced. For the analyses examining T3 bother score differences by consequence frequency at T3, we divided participants at the median into a high consequence frequency group and a low consequence frequency group. At T4 a RAPI frequency score was computed as the sum of frequencies across 18 items (average alpha across cohorts = .91). There were two RAPI items assessed at T3 that were omitted from the test battery at T4

(“had a bad time” and “felt you were going crazy”). Because the T3 and T4 RAPI frequency scores were skewed, they were transformed to their natural log plus 1.

Alcohol use—Three alcohol use variables were assessed at both T3 and T4. First, participants reported the number of times they got high or drunk on beer, wine, and liquor in the last year coded on a 6-point ordinal scale ranging from never to 50+ times. The ordinal values were recoded to the midpoint of the categories and were summed across beverages to form a variable indicative of the total number of times one was high or drunk on alcohol, regardless of beverage type. Second, alcohol quantity was assessed separately for beer, wine, and liquor on a 9-point scale from no drinks to more than two six packs of beer, more than one gallon of wine, and more than a fifth of liquor, respectively. The maximum typical amount consumed of beer, wine, and liquor was used as the alcohol quantity measure at both assessment points. Finally, alcohol frequency was the maximum frequency (10-point scale from never to more than once a day) of drinking beer, wine, and liquor in the last year.

Demographic variables—Sex (coded 1 for male and 0 for female) and two dummy variables for age with the youngest cohort (age 18 at T3) as the reference group were included in all analyses. In addition, exploratory analyses were conducted for the middle cohort (age 21 at T3) for those currently enrolled in a 2- or 4-year college at T3 ($n = 195$) vs. those not currently or ever as yet enrolled in college ($n = 100$) by T3.

Analytic Plan

We first examined descriptive statistics for each consequence. Next we conducted t-tests and ANOVAs to test for differences in ratings of bother (T3 bother score) by sex, age, low and high frequency of experiencing consequences, and college status. We also repeated these analyses to examine sex, age, and college status differences in the T3 RAPI frequency score.

In order to examine all predictors together with the T3 bother score as the outcome, as well as to test interactions among the predictors, we conducted a hierarchical regression analysis. In the first step, T3 bother was regressed on sex, age, and T3 RAPI frequency. In the second step we entered the interactions between the dummy variables of age and sex with the T3 RAPI frequency score (centered) to the model to see if consequences had a different effect on bother score by sex or age. A second hierarchical regression analysis was conducted with the middle cohort in order to test main and interaction effects of college status with consequence frequency and sex in predicting the T3 bother score. College status, sex, and T3 RAPI frequency were entered in step one. In step two, interactions of college status by T3 RAPI frequency (centered) along with college status by sex were entered.

For the longitudinal analyses, several regression analyses were conducted. First, a logistic regression analysis was conducted to determine whether T3 bother score predicted whether someone stopped drinking during the 7 years between T3 and T4, controlling for sex, age, and T3 RAPI count. We then conducted a series of hierarchical regressions to determine whether bother score at T3 predicted T4 drinking outcomes (times high on alcohol, alcohol quantity, alcohol frequency, and RAPI frequency). In the first step of all models we included sex, age, T3 bother, and T3 RAPI count. We also included T3 times high on alcohol as a control variable in the prediction of T4 times high on alcohol, T3 alcohol quantity in the prediction of T4 alcohol quantity, and T3 alcohol frequency in the prediction of T4 alcohol frequency. (Note that there were no problems of multicollinearity between the T3 alcohol measures and the T3 RAPI count score.) In the second step we added the interactions of sex, age, and the T3 consequence count score (centered) with the T3 bother score (centered).

Results

Which Consequences Are Most Bothersome?

Table 1 shows the list of the 20 consequences in rank order from the most bothersome to the least with the percentage experiencing them, the percentage rating them across bothersome categories, and the mean bother score among those who experienced them. The most prevalent consequences experienced by more than one fourth of the sample were had a bad time, got into fights, and neglected responsibilities. The least prevalent consequences experienced by less than 5% of the sample were felt you were going crazy, felt dependent on alcohol, had withdrawal symptoms, and relatives avoided you.

Most of the items were rated between a little bothersome and somewhat bothersome. Consequences indicative of an alcohol problem (i.e., withdrawal symptoms, felt you had a problem with alcohol, felt dependent) were rated as most bothersome. Around three-fourths of the sample who experienced these consequences rated them as somewhat or very bothersome. In addition, interpersonal problems, such as caused shame and got into fights, were also rated relatively highly in terms of bother; 73.3% of those who experienced the former rated it as somewhat or very bothersome and 65.5% of those who experienced the latter rated it as somewhat or very bothersome. Went to school or work high and tried to control one's drinking were rated as least bothersome with less than one fifth of those who reported these outcomes rating them as somewhat or very bothersome and around one half rating them as not at all bothersome.

Are There Differences in Ratings of Bother by Sex, Age, Frequency of Experiencing Consequences, and College Status?

The bivariate analyses indicated that women ($M = 2.60$, $SD = 0.81$) rated consequences as more bothersome than men ($M = 2.35$, $SD = 0.80$), $t[844] = 4.32$, $p < .001$). The ANOVA examining age differences in bother score was significant ($F[2, 843] = 3.47$, $p < .05$). Tukey's HSD test indicated that the oldest youth (age 24; $M = 2.56$, $SD = 0.80$) rated consequences as more bothersome than the youngest youth (age 18; $M = 2.38$, $SD = 0.82$); the 21-year-olds ($M = 2.45$, $SD = 0.81$) did not differ significantly from the other two groups. Individuals with a lower consequence frequency score rated the consequences that they experienced as less bothersome ($M = 2.35$, $SD = 0.95$) than those with a higher consequence score ($M = 2.56$, $SD = 0.67$), $t[663.8] = -3.66$, $p < .001$). The differences in T3 bother score between college students ($M = 2.44$, $SD = .80$) and nonstudents ($M = 2.47$, $SD = .84$) in the middle cohort was not significant ($t[230] = -.32$, $p = .75$).

We also examined sex, age, and college status differences in the T3 RAPI frequency score. Males ($M = 1.43$, $SD = 0.99$) reported significantly higher frequencies ($t[1159] = -7.14$, $p < .001$) than females ($M = 1.02$, $SD = 0.93$). The ANOVA for age differences was significant ($F[2, 1158] = 3.47$, $p < .05$). Tukey's HSD test indicated that 21-year-olds ($M = 1.32$, $SD = 1.02$) reported significantly ($p < .001$) higher frequencies than 24-year-olds ($M = 1.13$, $SD = 0.96$), whereas 18-year-olds ($M = 1.23$, $SD = 0.95$) did not differ from the other two age groups. The difference between college students ($M = 1.43$, $SD = 1.02$) and nonstudents ($M = 1.31$, $SD = 1.00$) in the T3 RAPI frequency score was not significant ($t[293] = 1.01$, $p = .31$).

The main effects model predicting T3 bother score from sex, age, and T3 RAPI frequency was significant ($R^2 = .06$, $p < .001$). As found in the bivariate analyses, women compared to men ($b = -0.30$, $\beta = -0.18$, $SE = .06$, $p < .001$), older (age 24) compared to younger (age 18) emerging adults ($b = 0.21$, $\beta = 0.12$, $SE = .07$, $p < .01$), and those who experienced consequences more frequently ($b = 0.20$, $\beta = 0.19$, $SE = .04$, $p < .001$) rated them as

significantly more bothersome. The addition of the interactions between the dummy variables of age and sex with the consequence frequency score did not result in a significant overall change in R^2 ($p > .05$).

The main effects model predicting T3 bother score from college status, sex, and T3 RAPI frequency (in the middle cohort) was significant ($R^2 = .06$, $p < .01$). Consistent with previous results, women, compared to men, ($b = -0.28$, $\beta = -0.17$, $SE = .11$, $p < .05$) and individuals who experienced consequences more, compared to less, frequently ($b = 0.21$, $\beta = 0.20$, $SE = .07$, $p < .01$) reported higher bother scores, whereas college status was not a significant predictor of bother score ($b = 0.09$, $\beta = 0.06$, $SE = .11$, $p > .05$). In the second step, the addition of the interactions between college status and T3 RAPI frequency and between college status and sex did not result in a significant overall change in R^2 ($p > .05$).

Do T3 Bother Scores Predict T4 Drinking Patterns and Problems?

The model predicting whether someone stopped drinking during the 7 years between T3 and T4 was significant (Wald Chi-Square = 28.31, $p < .001$); however, bother score did not significantly predict stopping ($OR = 0.94$, 95% CI [0.77, 1.14], $p > .05$). In contrast, the number of consequences experienced at T3 did ($OR = 1.13$, 95% CI [1.08, 1.18], $p < .001$); those who experienced more, compared to fewer, consequences at T3 were more likely to stop drinking. Sex ($OR = 0.81$, 95% CI [0.60, 1.11]) and age (age 21 $OR = 1.07$, 95% CI [0.75, 1.54]; age 24, $OR = 1.19$, 95% CI [0.81, 1.73]) were not significant predictors of stopping ($ps > .05$).

Table 2 shows the results of the regression analyses predicting each of the T4 drinking outcomes from sex, age, T3 bother score, T3 RAPI count score, and the same alcohol use outcome at T3 (when applicable). Bother score at T3 did not significantly predict any of the outcomes at T4. In contrast, those who experienced more consequences at T3 reported a higher quantity of alcohol use and a higher RAPI frequency score at T4. Men, compared to women, reported higher scores on all outcomes. Those who were 18 years old at T3 reported a greater number of times high on alcohol and more alcohol problems at follow-up compared to both 21- and 24-year-olds. As would be expected, the alcohol use outcome at T3 was the strongest predictor of the same alcohol use outcome at T4. In the second step, the interactions between sex, age, and the T3 RAPI count score with the T3 bother score did not result in a significant overall change in R^2 for any outcome ($ps > .05$).

Discussion

This is the first community study to measure the salience of alcohol-related consequences using longitudinal data spanning emerging and young adulthood. Most youth evaluated the majority of consequences as at least somewhat bothersome, consistent with Merrill et al. (2012), and were most bothered by consequences indicative of an alcohol problem. Notably, Mallett et al. (2008) reported greater variability in the ratings of consequences than we did. For example, in their study almost half the students rated blackouts as positive or neutral, whereas in this study only 12.8% rated them as not bothersome. In our sample, for 13 of the 20 consequences, more than half the sample rated them as somewhat or very bothersome; only two consequences (which, although being alcohol-related outcomes, are not necessarily consequences) were rated as somewhat or very bothersome by less than one-third of the sample. However, this study used different evaluation criteria than most of the previous studies, which have asked students to rate positivity and negativity of consequences. Instead, we asked how bothered students were by the consequences they experienced. Thus, it is plausible that differences in measurement of salience can, in part, explain some of the differences in results. Nevertheless, Merrill et al. (2012) included evaluations of negativity, severity, and aversiveness in their subjective evaluations, and their results also showed much

greater variability in evaluations than in this study. It is also worth noting that certain consequences were evaluated quite differently in our study relative to other studies. For example, dependence-like problems were rated as most bothersome in our study, whereas these items were rated least bothersome in the study conducted by Merrill et al. (2012). It is plausible that differences between results could be due to differences in measurement (i.e., items, timing of assessments, number of assessments), sample characteristics, or historical cohorts; nonetheless, these differences underscore the need for continued research in this area.

Because we only had a measure of salience at one time point, we could not measure within-individual changes in salience over time. The accelerated cohort design, however, demonstrated that bother scores increased from early to later emerging adulthood. This was opposite to our hypothesis. We had expected that as youth aged and experienced greater numbers of consequences in their lives, they would find them less bothersome. Instead we found that as youth aged, they found consequences to be more bothersome. It may be that with advancing age, emerging adults begin to mature out of heavy drinking partly because they are not willing to experience negative consequences. For example, consequences of heavy drinking may interfere with adult roles, such as work and family responsibilities, which may be less relevant in early than later emerging adulthood (Labouvie, 1996). Merrill et al. (2012) also noted substantial within-individual changes based on multiple assessments of consequence ratings over time, albeit in a shorter period of time. Thus, future research may benefit from a focus on within-individual changes in salience of alcohol-related problems.

As predicted, women rated consequences as more bothersome than men. This finding is in accord with Gaher and Simons (2007) who found that men rated consequences more positively than women. However, the non-significant interaction between sex and consequence frequency suggests that the reason why women rated consequences as more bothersome was not influenced by how often they experienced consequences. Rather, women may simply be less tolerant of negative outcomes than men. More research is needed to understand how evaluations change in response to experiencing consequences (Patrick & Maggs, 2011) as well as to tease apart sex differences.

No previous studies have examined consequence salience among nonstudent emerging adults. We found no differences in evaluation of consequences by college status. We also found no college status differences in the frequency of experiencing negative consequences at age 21. Nevertheless, previous studies have indicated that nonstudent emerging adults go on to experience more alcohol-related problems in adulthood than college student emerging adults (White et al., 2005). Therefore, the former group is in need of preventive interventions. Based on our findings, PFIs that provide personal feedback about negative consequences should work equally well with non-college emerging adults as with college students, although more research is needed to evaluate such interventions.

The overall bother score was higher for those who experienced consequences more frequently, which is also opposite of what has been found in some studies. For example, Patrick and Maggs (2008), who had students rate all consequences rather than just the ones that they had experienced, found that consequences were rated more positively by those who experienced more consequences. It is possible that the actual experience of a specific consequence increases its perceived negativity. Yet, Merrill et al. (2012) assessed salience only when a consequence was experienced, similar to our study, and found no differences in consequence evaluation when comparing high- and low-consequence drinkers. Again, it is possible that the methodological differences between that study and the current one can explain some of the different results.

Overall, this study showed that, with controls for prior drinking behavior, the experience, rather than the evaluation, of negative consequences was a better predictor of later drinking behavior. Although previous research suggests that students may become “immune” to negative consequences (e.g., Gaher & Simons 2007), our results clearly show that those who experience consequences more frequently are more likely to quit drinking. Thus, the experience of negative consequences is salient for some emerging adults. On the other hand, among those who continued to drink, those who experienced more alcohol-related problems at T3 also reported heavier drinking (i.e., higher quantities) and more drinking problems at T4. This stability of problematic drinking may reflect the fact that those youth who continue to drink heavily despite the experience of negative consequences either have become immune to their experience or have developed a dependence on alcohol making it difficult for them to stop or cut down. Although our study utilized a total consequence score, recent research by Read, Wardell, and Bachrach (2012) suggests that specific types of consequences are particularly important when considering future drinking, and that the influence of consequence type is different for males and females. For example, they found that problems related to blackout drinking were positively related to future drinking for men, yet negatively associated with future drinking for women. Thus, considering specific consequence types in future research on both salience and experience of consequences is needed.

In a previous cross-sectional study, Gaher and Simons (2007) found that students who rated alcohol-related problems as less negative were more likely to drink heavily and to experience more alcohol-related problems. Further, Merrill et al. (2012) found that more negative ratings of consequences were associated with less drinking from week-to-week. In contrast, we found that ratings of bother did not predict later drinking patterns. Our findings are also inconsistent with those of Patrick and Maggs (2011), who found that less negative evaluations of “negative” consequences were significantly predictive of more alcohol problems at the next assessment. Perhaps salience is important in the short term as these previous studies have found, but after a significant amount of time elapses, it becomes less important. Given that we had a minimum of a 4-year and maximum of a 7-year gap between the ratings of consequences at T3 and the outcomes at T4, during this time salience may have dissipated.

There are several limitations that should be considered when interpreting these results. As stated above, we only had a measure of salience at one point in time so we could not measure stability and change over time. Also, drinking behavior and alcohol-related problems were assessed only with self report. However, self reports have been found to be a valid method to assess youthful drinking (Laforge, Borsari, & Baer, 2005). In addition, we used only the RAPI items and did not assess other types of problems. We also did not assess the context in which the consequences were experienced. Furthermore, salience data were collected in the mid 1980s and evaluations of consequences may change over time. Nevertheless, given that rates of binge drinking among college students have remained relatively stable for the past three decades (Schulenberg & Patrick, 2012), it is reasonable to assume that emerging adult experiences and possibly interpretations of consequences have also remained somewhat stable. Another potential limitation is that consequences were retrospectively reported and youth had to attribute consequences to their drinking. Specifically, questions were asked about consequences experienced in the last 3 years, which could affect accurate recall of the number of times consequences were experienced as well as personal reactions to the experience. In addition, bother scores were based on different types and numbers of consequences for each individual. As pointed out by Merrill et al. (2012), and highlighted above in recent work by Read et al. (2012), more research is needed in this area that can tease apart the influence of experiencing specific consequences on future evaluations and behaviors, as opposed to examining problems as a whole. Also, in

the present study we did not focus on positive consequences (see Lee et al., 2011). Understanding positive consequences may be important for motivational interventions when discussing the pros and cons of drinking and in helping students to identify alternative activities to achieve the same positive outcomes. Finally, the sample was originally recruited through a telephone survey of one state and was primarily white; therefore, the results may not generalize to all emerging adults living in the United States.

Our results indicate that the salience of consequences varies among emerging adults and differs by age and sex. Therefore, providing negative consequence feedback in PFIs, especially those not administered in-person could have serious clinical and ethical implications (Mallett et al., 2008). For example, presenting students with a list of personal consequences, which they evaluate as positive, could undermine the effects of an intervention. Therefore, it may be important for feedback to be presented in-person within a motivational interview (Mallett et al., 2008). In that way, trained clinicians can discuss both the positive and negative consequences of drinking and perhaps use a decisional balance exercise. White et al. (2007) found that, over the long-term, a PFI delivered in-person within the context of a motivational interview was more effective in reducing alcohol-related negative consequences than written personal feedback alone. Perhaps it was the counselor's awareness of the student's perceptions of the various consequences and his or her ability to discuss those perceptions that led to this outcome. Because those youth who view some consequences as more negative may be motivated to avoid them and respond better to interventions that focus on them (Patrick & Maggs, 2011), it is imperative for future research to continue to identify the most salient consequences to be included in PFIs. Identifying which consequences are actually considered negative and who experiences them as negative may help interventions to capitalize on the most salient ones and know which ones will help motivate youth to change their drinking behavior.

Acknowledgments

Preparation of this paper was supported, in part, by grants from the National Institute on Alcohol Abuse and Alcoholism (R01 AA 019511) and National Institute on Drug Abuse (R01 DA03395). The authors thank Eun-Young Mun and Su-Young Kim for their suggestions on this manuscript.

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Table 1

Individual Consequence Bother Scores and Prevalence Rates

Consequence	Not at all (%)	A little (%)	Somewhat (%)	Very much (%)	Mean (SD) Bother	Prevalence Rate (%)
Felt that you had a problem with alcohol	2.4	19.1	29.8	48.8	3.25 (0.85)	7.2
Felt dependent on alcohol	6.1	21.2	27.3	45.5	3.12 (0.96)	2.9
Had withdrawal symptoms	0.0	24.0	40.0	36.0	3.12 (0.78)	2.2
Caused shame or embarrassment to someone	8.1	18.6	37.6	35.7	3.01 (0.93)	18.1
Got into fights with other people	8.9	25.7	32.2	33.3	2.90 (0.97)	29.1
Felt you were going crazy	11.5	23.1	30.8	34.6	2.88 (1.02)	4.5
Blackouts	12.8	28.6	26.9	31.7	2.78 (1.03)	19.6
Had a bad time	11.8	31.2	36.8	20.3	2.66 (0.93)	29.5
Neglected your responsibilities	7.8	35.3	34.3	22.6	2.72 (0.90)	26.4
Missed out b/c you spent too much on alcohol	12.2	30.6	35.7	21.4	2.66 (0.95)	8.4
Kept drinking when promised not to	9.5	36.9	34.2	19.4	2.63 (0.90)	22.9
Weren't able to do homework or study for a test	14.9	32.1	30.2	22.8	2.61 (1.00)	18.4
Passed out or fainted suddenly	21.4	23.4	28.1	27.1	2.61 (1.10)	16.5
Noticed a change in your personality	21.8	30.3	20.7	27.1	2.53 (1.11)	16.4
Was told by a friend to stop or cut down drinking	12.6	26.4	36.8	24.1	2.72 (0.97)	12.3
Relatives avoided you	33.3	25.0	8.3	33.3	2.42 (1.31)	1.0
Missed a day (or part of a day) of school / work	27.7	32.4	23.3	16.6	2.29 (1.05)	21.8

Consequence	Not at all (%)	A little (%)	Somewhat (%)	Very much (%)	Mean (SD) Bother	Prevalence Rate (%)
Tolerance	26.5	36.5	21.8	15.2	2.26 (1.01)	18.3
Went to work or school high or drunk	45.8	37.7	13.2	3.3	1.74 (0.81)	18.4
Tried to control your drinking	55.5	27.7	11.0	5.8	1.67 (0.89)	13.4

Note. *ns* vary for each consequence Table 2

Table 2

Regression Coefficients when Predicting T4 Drinking Outcomes from Sex, Age, T3 Bother Score, T3 RAPI Count, and T3 Alcohol Use (n = 795 to 796)

Predictor	T4 Times High on Alcohol	T4 Alcohol Quantity	T4 Alcohol Frequency	T4 RAPI Frequency
Male	7.39 (1.75)*** <i>0.14</i>	0.57 (0.13)*** <i>0.15</i>	0.51 (0.15)** <i>0.12</i>	0.31 (0.07)*** <i>0.15</i>
Age 21	-7.17 (2.03)*** <i>0.13</i>	-0.28 (0.15) <i>-0.07</i>	-0.40 (0.17) <i>-0.09</i>	-0.37 (0.08)*** <i>-0.18</i>
Age 24	-7.14 (2.12)*** <i>0.13</i>	-0.28 (0.15) <i>-0.07</i>	-0.42 (0.18) <i>-0.09</i>	-0.28 (0.08)*** <i>-0.13</i>
T3 Bother Score	0.71 (1.07) <i>0.02</i>	-0.13 (0.08) <i>-0.05</i>	-0.11 (0.09) <i>-0.04</i>	<0.01 (0.04) <i><0.01</i>
T3 RAPI Count	0.25 (0.28) <i>0.03</i>	0.05 (0.02)** <i>0.09</i>	0.02 (0.02) <i>0.03</i>	0.11 (0.01)*** <i>0.37</i>
T3 Alcohol Use	0.28 (0.03)*** <i>0.32</i>	0.32 (0.04)*** <i>0.32</i>	0.37 (0.05)*** <i>0.29</i>	
R^2	0.17***	0.20***	0.12***	0.19***

Note. Unstandardized coefficients are presented with standardized errors in parentheses and standardized coefficients below in italics. In each model, the T3 alcohol use variable is the same as the T4 alcohol use outcome.

**
 $p < .01$.

 $p < .001$