Recent Sexual Victimization and Drinking Behavior in Newly Matriculated College Students: A Latent Growth Analysis

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Abstract

Objective: College matriculation is a time of developmental and social change, and is often a time of heavy drinking. Sexual victimization (SV) is prevalent in late adolescence and poses additional risk for problem drinking behavior. Thus, matriculating students with a SV history may be at heightened risk for maladaptive alcohol use while transitioning through the first year of college. Further, victimization that has occurred close to college matriculation may confer particular risk for problem alcohol use, as the added stressor of coping with a SV while negotiating the transition into college may lead to risky drinking behavior. Therefore, examining the influence of SV timing (i.e., recency) on drinking patterns in freshman year was the aim of the present study.

Methods: Matriculating undergraduates with a history of SV were assessed at six points during freshman year. Using latent growth curve modeling, we tested differences in trajectories of drinking behavior (i.e., alcohol use, binge drinking) between students who reported a recent SV and those who reported a more distal SV.

Results: Students endorsing a recent SV evidenced greater overall levels of alcohol use and higher levels of binge drinking than individuals with SV that was less recent. Moreover, the recent SV group showed significantly more variability in drinking outcomes over freshman year, with escalations mapping onto more salient periods of transition over the first college year.

Conclusion: Sexual victimization that occurs close to college entry is associated with specific and persistent risk for maladaptive drinking behavior in newly matriculated college students.

Keywords

Sexual victimization; alcohol use patterns; binge drinking; college

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The new freedoms and responsibilities that typically accompany the transition into college can facilitate growth and development, but also can introduce new challenges and risks (Schulenberg, Maggs, & Hurrelmann, 1997). Among these is the risk for heavy drinking (e.g., frequent alcohol use, binge drinking), which is common on college campuses and often is accompanied by significant consequences (O'Malley & Johnston, 2002; Wechsler, Dowdall, Davenport, & Castillo, 1995).

The successful navigation of the transition into college may be particularly difficult for students with a history of sexual victimization (SV). Rates of sexual victimization peak during late adolescence and early adulthood (Humphrey & White, 2000; Kilpatrick, Saunders, & Smith, 2003; Tjaden & Thoennes, 2000; Tjaden & Thoennes 2006), and data show that many students enter college already having experienced sexual assault

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victimization (Humphrey & White, 2000; Testa, Hoffman, Livingston, & Turrisi, 2010). Sexual victimization and alcohol involvement are linked. A large body of research has shown that heavy drinking increases risk for victimization in college (e.g., Abbey, 2002; Testa & Livingston, 2009). Though less often examined, studies also have documented risk for heavy drinking in undergraduate populations that is conferred by SV (Bedard-Gilligan, Kaysen, Desai, & Lee, 2011; Miranda, Meyerson, Long, Marx, & Simpson, 2002; Larimer, Lydum, Anderson, & Turner, 1999; Reed, Amaro, Matsumoto, & Kaysen, 2009).

The timing of victimization may have implications for subsequent drinking, and as such, victimization that has occurred close to the time of college entry may be especially problematic. Studies have found that psychosocial functioning is compromised in the period immediately following sexual victimization (e.g., Resnick, Acierno, & Kilpatrick, 1997; Walsh et al., 2012). Moreover, data from Kaysen and colleagues (2006) show that risky drinking is related to the recency of sexual victimization in college students. These investigators found that alcohol use and alcohol-related consequences were highest in the year after their assault (Kaysen, Neighbors, Martell, Fossos, & Larimer, 2006). Thus, the months that follow sexual victimization appear to be a period of vulnerability - vulnerability which may be augmented by the challenges of entry into the college context.

Alcohol Use, Sexual Victimization, and the College Context

Several researchers have attributed increases in heavy drinking to the college experience (see reviews by Goldman, Boyd, & Faden, 2002; Ham & Hope, 2003), and several aspects of this experience likely contribute to this risk. For example, freshman year of college in particular is marked not only by an increase in *exposure* to and use of alcohol, but it is also a time when *patterns* of alcohol use may begin to be established. This time, which overlaps with college matriculation, is commonly referred to as "emerging adulthood" (Arnett, 2005). Hallmark features of this period include an increase in independence, a decrease in adult supervision, and general instability as both relationships and environments are in flux (Arnett, 2005; Shaver, Furman, & Buhrmester, 1985). Even for those who continue to live at home, entering college typically involves separation from family and friends, as well as adjustment to an environment that presents new academic and social demands (Compas, Wagner, Slavin, & Vannatta, 1986). Although college can provide numerous opportunities for growth, many individuals report that negotiating the college context is a particularly challenging aspect of the transition into adulthood (Compas, et al., 1986; Montgomery & Côté, 2006). Finally, matriculating students often do not have the same access to support and coping resources that previously were available (e.g., familiar peers, family) and thus may turn to alcohol to manage emotional distress. All of these factors may heighten a student's vulnerability to using alcohol, either to fit in with a new social milieu where the social and environmental contingencies are oriented toward drinking, or in response to increased alcohol availability and decreased supervision. Moreover, as emotional and instrumental resources are often taxed during the transition into college, alcohol use also may increase to manage stressors in the absence of other resources.

The literature also highlights the significance of *transitions* in this population, as increases in substance use are evident as youths move from high school to college (Arnett, 2005; Bachman et al., 1997). Further, studies have demonstrated that fluctuations in drinking over the course of the academic year are characteristic of many college students and are often linked to academic demands and school breaks/holidays (Del Boca, Darkes, Greenbaum, & Goldman, 2004; Hingson, Heeren, Winter, & Wechsler, 2005; Neighbors et al., 2011). These fluctuations reveal non-linear patterns of alcohol behavior, some of which map onto transitions on and off campus (Del Boca et al., 2004). In light of this, fluctuations in drinking following a traumatic life event (i.e., sexual victimization) may be most

pronounced at critical junctures, such as when students are transitioning in and out of the college environment (i.e., when first arriving to college in freshman year and returning to college for 2nd semester).

In summary, in the first college year, in the context of a new environment, and with increased and freer access to alcohol, those students who have experienced a recent sexual victimization may drink more and engage in dangerous patterns of drinking, such as binge drinking, and thus may encounter more alcohol-related consequences (Kassel, Jackson, & Unrod, 2000; Park, & Levenson, 2002; Stewart, Zeitlin, & Samoluk, 1996). This may be especially true during specific times of change and transition.

Surprisingly, prospective examinations of drinking behaviors among individuals with SV have been few (see Kilpatrick et al., 1997; Stewart, Pihl, Conrod, & Dongier, 1998). In addition, prospective studies that have been conducted have relied on few and/or infrequent points of assessment, and have not sought to examine dynamic trajectories of drinking behavior, particularly as they may interact with times of transition over the college year. Finally, to our knowledge, studies to date have not explicitly examined the influence of the timing of sexual victimization and the potential impact of this timing on drinking outcomes (i.e., contrasting recent SV to previous SV) during the transition into college. This is particularly important as the association between victimization and subsequent drinking behavior may be exacerbated at these more vulnerable times.

The Present Study

The primary aim of the present study was to examine trajectories of drinking behavior in the first year of college as a function of the timing of sexual victimization experiences. As past studies have established that a SV history can confer risk for problem drinking (Miranda et al., 2002; Reed et al., 2009), the purpose of the current study is to extend this work to examine how *timing* of the SV impacts the association between SV and drinking behavior within a sample of sexually victimized individuals. To target the effects of a *recent* SV over more general effects of a SV history, we compared patterns of drinking behavior for matriculating students who endorsed SV within the year leading up to matriculation to students who reported sexual victimization prior to the pre-matriculation year (i.e., prior to the age of 18). For the purpose of this study, sexual victimization was broadly defined as 'a range of sexual experiences that occur without consent' (e.g., fondling, penetration). Assessment began in September of the first year of college (baseline assessment, T1), and continued at frequent intervals (i.e., 3 additional times in the fall semester, two times in the spring semester) throughout that year.

We expected that individuals with a recent sexual victimization would exhibit more risky drinking behavior (i.e., use, binge episodes) over the course of their first year of college as compared to those whose sexual victimization experiences were more temporally distal (i.e., prior to the year of matriculation). We also expected that there would be more drastic changes in drinking behavior during periods of transition into and out of the college setting, and that this pattern would be most notable for those with more recent victimization.

Methods

Procedure

Data from the current study were collected as a part of a larger longitudinal study examining trauma and substance use in college students. Incoming freshmen were recruited from two midsize public U.S. universities (i.e., northeastern and southeastern). Participants were over-recruited for strong representation of trauma history and post-traumatic distress. Recruitment

procedures have been described in detail elsewhere (citation removed for anonymity). Participants recruited into the longitudinal arm of the study completed online surveys at 6 time-points over the 1st year of college (T1= September, T2= October, T3 = November, T4 = December, T5 = February, and T6 = April). Each survey assessed drinking behavior over the past month, and participants were given one month to complete each assessment. The T1 survey opened one week after the start of the fall semester, and so this assessment captured drinking behavior leading up to and including the transition into the college environment. The T4 assessment captured drinking behavior during semester finals and over winter recess. The T6 assessment captured the end of the second semester, and for many students, overlapped with the week-long Spring Break. More frequent assessment was completed during the first semester of college to closely track patterns of drinking behavior while transitioning into the college environment. Survey completion at each time-point was compensated with gift cards to local retailers.

Participants

In order to target the individuals who reported a recent SV, only those participants who were 18 years of age at the baseline assessment (September of first college year) were included in the present study. Thus, participants reporting a SV since their 18th birthday would have to have experienced this victimization within the year prior to baseline assessment. The sample was comprised of 169 individuals who reported a history of sexual victimization. Of this sample, 44 reported a sexual victimization after the age of 18 (recent SV group), 21 (47%) of whom also endorsed a SV prior to the age of 18. The remainder of these this sample (n=125) reported sexual victimization only before their 18th birthday and no SV after the age of 18 (previous SV group; see Traumatic Life Events Questionnaire in Measures section below).

The sample consisted of 90% female students (n=152), and approximately 64% (n=109) of students were from the northeastern study location. The majority of the sample was Caucasian (62.5%, n=105), while 10.1% were Asian (n=17), 17.3% were Black (non-Hispanic, n=29), 5.9% Hispanic/Latino (n=10), and 4.1% identified as Biracial (n=7). One participant did not report ethnicity.

Measures

Demographics—Demographic information was collected at time 1. Participants reported on variables such as age, sex, and ethnicity.

Sexual victimization—The Traumatic Life Events Questionnaire (TLEQ) is a self-report measure that consists of 21 yes/no items assessing lifetime trauma exposure.[1] Items pertaining to sexual victimization were used for classification into two sexual victimization groups. The first group (n=44) included those who reported experiencing a sexual victimization since their 18th birthday (i.e., "After your 18th birthday: Did anyone touch sexual parts of your body or make you touch sexual parts of his or her body against your will or without your consent?"). The second group (n=125) was comprised of individuals who endorsed being sexually victimized prior to their 18th birthday.

Alcohol use—Participants were asked to report on the frequency of drinking occasions over the past month at T1 through T6 (i.e., "Think of all of the times in the past month when you have had something to drink. How often have you had some kind of beverage containing alcohol?") Response options included 0=*Never,* 1= *about once a month*, 2=2-3

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times in the past month, 3=*once or twice per week*, 4=*three to four times a week*, 5=*nearly every day*, 6 = everyday. Participants also reported on the typical number of standard drinks per drinking occasion over the past month (i.e., "In the past month, when you were drinking alcohol, how many drinks did you usually have on any one occasion?"). Standard drinks were defined at the beginning of the alcohol use survey (e.g., 1 DRINK = 1 Beer (12 ounces), 1 glass of wine (5 ounces), 1 shot of liquor (1 – 1.5 ounces). Responses ranged from 0 = *Didn't drink in the past month*, 1=*less than one*, 2=*one total*, 3=*two total*, 4=*three total*, 5=*four total*, 6=*five total*, 7=*six total*, 8=*seven total*, 9=*eight total*, 10 = *nine or more total*. Following numerous studies assessing drinking behavior, the quantity and frequency measures were combined into a quantity × frequency index in substantive data analyses (O'Connor & Colder, 2005; Read et al., 2012; Wood, Read, Palfai, & Stevenson, 2001).

Binge drinking—Participants reported on heavy episodic drinking in the past month with an item that queried, "In the past month, how many times have you had five or more drinks at a single sitting, either beer, wine, wine coolers, liquor, or some combination of these?" Responses were on a 6 point scale (0=*did not drink 5 or more drinks in a single sitting*, 1=*about once a month*, 2=*2-3 times in the past month*, 3=*once or twice per week*, 4=*three to four times a week*, 5=*nearly every day*, 6 = *everyday*).

Data Analytic Approach

Descriptive Analyses—Means, standard deviations, and distributions were examined. As the observed alcohol use and binge drinking variables were skewed, robust maximum likelihood (MLR) estimation was used in all analyses to correct fit indices and standard errors for the effects of non-normality. T-tests were run to examine trauma history at baseline and mean differences between the recent SV and previous SV groups on alcohol use and binge drinking at each time point across freshman year. Because of the longitudinal design of our study, we used full-information robust maximum likelihood estimation in our analyses to accommodate missing data. We also examined predictors of missing data to determine whether a missing at random assumption was tenable.

Latent Growth Curve Analyses—Latent growth curve models (LGCMs) were used to test primary aims as this analytic approach provided a framework to describe sample average trajectories as well as individual differences in growth and predictors of drinking behavior over the first college year (Curran & Muthén, 1999). LGCMs were estimated in Mplus version 5.2 using full-information robust maximum likelihood estimation (Muthén & Muthén, 2010). Separate models were estimated for alcohol use and binge drinking. In addition to the model χ^2, the Normed Chi-Square Index (χ^2/df), the Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), and Root Mean Square Approximation (RMSEA) were examined. A model's fit was considered good if $\chi^2/df < 3.0$, RMSEA < .05, CFI > .95, and TLI > .95. Model fit was deemed to be adequate if $\chi^2/df < 5.0$, RMSEA < .08, CFI > .90, and TLI > .90 (Hu & Bentler, 1999; Kline, 2005; Tucker & Lewis, 1973).

The primary aim of this study was to determine if the timing of a sexual victimization (recent versus previous) predicted change in alcohol use (quantity-frequency index) and binge drinking across the first year of college. As a first step toward addressing this aim, a series of unconditional growth models were tested to determine the shape of the trajectories for alcohol and binge drinking in the entire sample of students with histories of victimization. The shape of growth was tested for each construct and growth models included intercept and slope factors. The factor loadings for the slope factors included linear, quadratic, and cubic trends, and the intercept was defined as the first (T1) assessment. First, a model that specified only an intercept was examined, and then linear, quadratic and cubic growth factors were added sequentially. Nested model tests were performed to determine the

contribution of each latent growth factor to model fit to determine which factors to retain. To perform nested model tests, we used a program that calculates scaled chi-square difference tests (see Satorra & Bentler, 2001; Crawford & Henry, 2003).

After determining the best fitting growth model, conditional growth models were specified with sexual victimization status as the predictor of growth factors, to test for differences among the groups. In these models, all growth factors were regressed on a dummy coded variable representing two orthogonal SV groups; recent SV (SV since 18th birthday) and previous SV (SV prior to 18th birthday only). The recent SV was used as the reference group.

Results

Descriptive Analyses

The recent SV and previous SV group did not differ in terms of ethnicity; however, the recent SV groups had a significantly higher number of males than the previous SV group (20.4% vs. 6.5% respectively). T-tests showed that alcohol use was significantly higher for the recent SV group across all time points except T4, which coincides with both final exams – when students are typically studying and thus less inclined to drink alcohol – and winter recess – when most students are no longer on campus (see Table 1). The observed alcohol quantity × frequency means for the previous SV group ranged 5.8 to 6.6 whereas the recent SV group reported means ranged from 6.9 to 12.7 (see Table 1). The mean score on the binge drinking scale for the previous SV group stayed relatively consistent across freshman year (*M* range = .49 to .65; see Measures for scoring), whereas the recent SV group reported higher binge drinking at college entry, a slight decline over first semester, and a marked increase over second semester (*M* range = .70 to 1.3). Furthermore, follow-up tests showed that the recent SV group reported significantly or marginally significantly higher levels of binge drinking episodes at all assessment points, except during finals/winter recess (T4), when binge rates were not reliably different between groups. T-tests also revealed that there were no significant differences between groups on baseline level of trauma history, with the recent SV and previous SV groups reporting the same number of traumatic events at college entry (i.e., recent SV *M(SD)*=4.5(2.8), previous SV *M(SD)*=4.5(2.6)*; p*=.99). Finally, analyses examining attrition and missing data revealed that 74% of participants had complete data for all six time-points, and 90% of the sample completed at least 5 of the total 6 possible assessments. Thus retention was high for the study. Follow-up analyses examining missing data suggest that data were missing at random. Students who had complete data did not differ from students with missing data on SV status (recent vs. previous), demographic variables (i.e., gender, ethnicity), or baseline drinking variables (i.e., alcohol use, binge drinking; all ps>.05).

Latent Growth Curve Analyses

Alcohol Use Unconditional Growth Model—For alcohol use the linear model was superior to the intercept only model, ($\Delta\chi^2(3)$=11.5, *p*<.05), and the quadratic model was superior to the linear model, ($\Delta\chi^2(4)$=12.29, *p*<.05). Adding a cubic growth factor resulted in problems in model estimation (i.e., Heywood case). Accordingly, we fixed the variance of the cubic growth factor to zero and this led to model convergence. However including the cubic growth factor did not improve on the fit of the quadratic model, ($\Delta\chi^2(1)$ =2.02, p>.05, *p*=0.11). Thus, we did not retain the cubic growth factor in the final model. The final model with random intercept, linear, and quadratic growth factors fit the data well according to most fit indices, ($\chi^2(12)$=22.62, *p*<.05, χ^2/df = 1.88, CFI=.96, TLI=.95, and RMSEA=.07). All growth factor means were significantly different from zero (intercept *M*= 8.2, *p*<.001,

linear $M =.64$, $p=.019$; quadratic $M=.09$, $p=.015$). Overall, the model accounted for between 72% and 97% of the variability in the observed alcohol use variables.

Alcohol Use Conditional Growth Model—The conditional model in which alcohol use trajectories were conditioned on baseline victimization status (recent vs. previous) fit the data well ($\chi^2(15)=29.34$, $p<.05$, $\chi^2/df = 1.96$, CFI=.97, TLI=.95, and RMSEA=.07). There was a significant intercept difference between the recent SV ($M = 11.88$, $SE=1.84$) and previous SV group ($M =6.51$, $SE=0.72$), where the recent SV group reported higher levels of alcohol use at college entry ($\beta = −.5.36$, $SE=.1.97$, $p=.007$). There was no significant difference in the linear trends between the two groups ($p=.10$). However, there was a significant difference on the quadratic slope ($\beta = −.19$, $SE=.09$, $p=.03$), with the recent SV group showing more quadratic change over time ($M=.24$, $SE=.08$) than the previous SV group ($M =.068$, $SE=.04$). The model implied trajectories for each group are plotted in Figure 1. The nature of this trend shows that the recent SV group reported significantly higher alcohol use at the outset of freshman year, a decline over first semester, and then an increase over second semester, approaching levels reported at the beginning of the school year. In comparison, the previous SV group showed less fluctuation in drinking over the year and generally had consistently lower levels of drinking.

Binge Drinking Unconditional Growth Model—For binge drinking, the linear model was not superior to the intercept only model ($\Delta\chi^2(3)=1.71$, $p=.52$). However, given our *a priori* hypotheses about fluctuations mapping onto times of transition on and off campus, and an examination of the means, we continued on to test the quadratic slope. The quadratic model fit the data better than the linear model ($\Delta\chi^2(4)=18.04$, $p<.05$). Adding a cubic growth factor resulted in non-convergence. Again, we set the variance of the cubic growth factor to zero, but in this model the addition of this cubic growth factor was not superior to the quadratic model ($\Delta\chi^2(1)=1.91$, $p=.16$), and so the cubic growth factor was not retained. The final model with intercept, linear, and quadratic growth factors fit the data well across most indices ($\chi^2(12)=22.80$, $p=.03$, $\chi^2/df = 1.90$, CFI=.96, TLI=.95, and RMSEA=.07. All growth factor means were significantly different from zero (intercept $M= .80$, $p<.001$; linear $M= −.10$, $p=.014$; quadratic $M= .01$, $p=.007$). Overall, the model accounted for between 70% and 83% of the observed variability in the binge drinking variables.

Binge drinking Conditional Growth Model—The conditional model for binge drinking showed good fit with the data ($\chi^2(15)=25.82$, $p<.05$, $\chi^2/df = 1.72$, CFI=.97, TLI=.96, and RMSEA=.06). There was a significant intercept difference between the recent SV and previous SV groups ($\beta = −.55$, $SE=.22$, $p=.014$), where the recent SV reported higher levels of binge drinking at college entry (recent SV: $M= 1.20$, $SE=.20$; Previous SV: $M=.65$, $SE=.10$). There was no significant difference for the linear trend between recent and previous SV ($p=.14$). As with the alcohol use model, the quadratic trends were significantly different between the victimization groups ($\beta = −.022$, $SE=.01$, $p=.04$), with the recent group showing greater non-linear change over the course of the first year of college (Recent SV: $M = .03$, $SE=.01$; Previous SV: $M =.009$, $SE=.01$). Figure 2 shows that the recent SV group had a small decline in binge drinking over the first semester, and then an increase in binge drinking over second semester to levels that were higher than at college entry. This is in contrast to the trajectory for the previous SV group that showed little fluctuation across the year.

Discussion

Though previous work has suggested that sexual victimization may pose risk for alcohol misuse in college, to our knowledge, none has examined the role of temporal proximity (i.e.,

how recently victimization occurred) in this association during the college transition. This distinction of SV timing is important when considering how individuals may negotiate the demands of adjusting to the college environment. Accordingly, this study was designed to look at the effect of the proximity of SV on drinking behavior (i.e., alcohol use and binge drinking) in newly matriculated college students over the first year of college. In this study, frequent assessments facilitated a finer-grained look at patterns of alcohol use and binge drinking than has previously been conducted, and the use of latent growth modeling demonstrated how patterns of alcohol behavior mapped onto important points of transition (i.e., matriculation, winter break), with more variability being observed for the recent SV group. Moreover, latent growth models permitted the examination of drinking over time in the sample as a whole, as well as in the separate trajectories for each victimization group.

The findings from this study suggest that sexual victimization occurring close to college matriculation is related to unique risk for maladaptive drinking behavior both at the time of matriculation and as the year progresses. Specifically, from our descriptive analyses, we observed that the recent SV group reported higher levels of alcohol use and binge drinking than the previous SV group across most time points occurring while on campus. Perhaps most concerning are the observed differences in binge drinking, with the recent SV group reporting almost twice the number of binge episodes at most points of assessment, with the largest differences appearing in the second semester. Binge drinking has been identified by the National Institute on Alcohol Abuse and Alcoholism (NIAAA) as a particularly maladaptive drinking behavior that often is linked to other negative outcomes (i.e., sexual assault, motor vehicle accident, arrest; Abbey, 1991; Baer, Kivlahan, & Marlatt, 1995; Wechsler, Dowdall, Davenport, & Castillo, 1995). Therefore, any report of a binge-drinking episode is indicative of risky drinking and one period of binge drinking can lead to serious repercussions. Interestingly, significant differences in drinking behavior for the recent SV and previous SV groups were not observed at the end of the first semester, as students were preparing to leave campus or were away from campus on winter recess (T4). Thus, the influence of recent SV on drinking behavior over the first year of college appears to vary as a function of contextual factors that are time-point specific, more so than the influence of more distal SV experiences. This is consistent with the perspective that it is an interaction between recent SV and exposure to the college environment that is associated with elevated risk for problem alcohol use for these individuals during freshman year.

Results of the latent growth analyses revealed that students with a recent SV also showed more dramatic *changes* in their alcohol use over the course of the year relative to those with SV that was not as recent. The plotted implied trajectories reveal that the recent SV group had high levels of alcohol use at the outset of college, a decline over first semester, and an escalation once returning for second semester. In comparison, the previous SV group showed a relatively stable level of alcohol use across freshman year. Binge drinking patterns were similar, with the recent SV group showing more change over time – with the most marked changes occurring in the second semester, where binge drinking escalated after the winter break to levels higher than those at college entry.

Though it was not examined in the current study, understanding why drinking trajectories vary for individuals reporting recent sexual victimization is important. Although only speculative at this point, perhaps the more variable drinking behavior in the recent SV group could be a function of unique drinking motives, such as drinking to manage distress (i.e., coping motives), or differences in social motives for drinking (e.g., drinking to be more outgoing if recent victimization interferes with typical social functioning). Recent research has provided support for the associations between poor college adjustment, drinking motives, and drinking outcomes (LaBrie, Ehret, Hummer, & Prenovost, 2012). Thus, future work should examine possible factors, which may help to explicate why individuals with a

recent sexual victimization are more at-risk for problem drinking in freshman year than those who were victimized less recently

Regardless, what can be seen from the results of the current study is that the college environment is more risky in terms of drinking behaviors for those reporting a recent SV as evidenced by higher levels of drinking at the initial transition into the college environment (T1), and the return to the college environment following winter recess (T5). On the other hand, the lower levels of drinking behavior in the recent SV group observed at T4 (semester exams, winter recess) may be interpreted as encouraging, as it appears that these students have the ability to reduce drinking behavior when negotiating exams and over the winter break, at least compared to students whose sexual victimization occurred less recently. Overall, these findings show that recent SV is not associated with a persistent, immutable risk for alcohol misuse, but instead that there is variability, likely due to context. This variability points to opportunities for intervention, as individuals approach transitions into and during the college context.

As in all research, there are limitations in this study, which should be considered when interpreting these results. Although our overall sample size was adequate, our sample of individuals reporting a *recent* sexual victimization was relatively small. Thus, we were not adequately powered to examine potential mediators or moderators of the relationship between SV timing and drinking outcomes in the context of the already complex latent growth curve models. It also is important to note that the previous SV group was more heterogeneous than our recent SV group, especially in terms of the timing of the sexual victimization, which could have important implications for interpreting drinking behaviors in this group. In a similar vein, given the high rates of previous victimization in the recent SV group, it is possible that observed differences could be attributed to a cumulative sexual trauma status and not necessarily to recency. In addition, comparing rates of re-victimization for individuals who reported a recent SV versus a previous SV also may highlight important differences between these two groups, as re-victimization may also be associated with risky drinking behaviors.

Our measure of sexual victimization also presented some limitations. For instance, groups were determined based on a single item from the trauma measure. Moreover, prior work suggests that certain aspects of the SV, such as the method of coercion used (e.g., force, incapacitation), may be differentially related to drinking outcomes (Kaysen et al., 2006). Yet the measures in the present study did not permit examination of types of sexual victimization experienced. Assessments pertaining to both timing and method of coercion currently are being collected.

Future work should examine relative patterns of drinking behavior for individuals who do not endorse any history of sexual victimization, as comparing students who report recent, previous, and no victimization could further elucidate the association of SV and patterns of college drinking behavior. Moreover, as rates of drinking behavior increased in the second semester, particularly for the recent SV group, future work will benefit from including more frequent points of assessment to better understand the changes following winter break. Also, possible explanations for the comparable levels of alcohol use and binge drinking during finals and winter break should be explored. Specifically, it appears that there may be something protective occurring during this period for those with recent SV. This may be that leaving the college environment is especially salubrious for this group, or that those with recent SV are able to show resilience during periods of high-demand, such as during exams. Possibilities are numerous, and remain to be explored.

Lastly, although research has long demonstrated that alcohol use is a risk factor for sexual assault (Testa & Livingston, 2009; Abbey, Zawacki, Buck, Clinton, & McAuslan, 2004), the reciprocal associations between alcohol and sexual victimization were not examined in the current study. Moreover, an examination of other variables that might underlie sexual victimization status and college drinking, such as pre-college drinking, also may help to elucidate the nature of the associations between alcohol use and sexual victimization status in college. This continues to be an important direction for future work, as understanding these complex relationships while also considering context (i.e., college transition) and timing (e.g., recent versus distal) of the SV may help us to better understand how these processes unfold and thus where prevention/intervention efforts would best be focused.

Conclusions and Clinical Implications

A substantial portion of matriculating college students report sexual victimization histories, and many of these have occurred temporally proximal to matriculation. Sexual victimization is linked with problem drinking in college, and the present data show that recent victimization is associated with particular risk for elevated drinking behavior over the first year of college. Our results have implications for both college-wide (universal) prevention programs and targeted individual (indicated) interventions. Whereas many prevention programs emphasize sexual victimization as a consequence of heavy drinking, programs should emphasize that sexual victimization can incur risk for maladaptive drinking habits. This information could help individuals identify the need to seek adaptive coping strategies if they experience sexual victimization. Similarly, interventions for college students who endorse sexual victimization should highlight the potential for problem drinking behavior and may focus on factors such as coping, social support, as well as drink refusal and harm reduction skills that may help to offset this risk. Lastly, the models tested in this study revealed patterns of change over time, suggesting that there are identifiable periods of risk for those with recent SV exposure. This suggests that we must look beyond the very initial transition into college and target interventions at subsequent points of potential vulnerability.

Acknowledgments

References

Abbey S. Acquaintance rape and alcohol consumption on college campuses: How are they linked? Journal of American College Health. 1991; 39:165–169. [PubMed: 1995654]

Abbey A. Alcohol-related sexual assault: A common problem among college students. Special issue: College drinking, what it is, and what do to about it: Review of the state of the science. Journal of Studies on Alcohol. 2002; S14:118–128.

Abbey A, Zawacki T, Buck PO, Clinton AM, McAuslan P. Sexual assault and alcohol consumption: What do we know about their relationship and what types of research are still needed? Aggression and Violent Behavior. 2004; 9(3):271–303.

Arnett JJ. The developmental context of substance use in emerging adulthood. Journal of Drug Issues. 2005; 35:235–254.

Arnett JJ. Emerging adulthood: A theory of development from the late teens through the twenties. American Psychologist. 2000; 55(5):469–480. [PubMed: 10842426]

Bachman, J,G.; Wadsworth, KN.; O'Malley, PM.; Johnston, LD., et al. Smoking, drinking, and drug use in young adulthood: The impacts of new freedoms and new responsibilities. Lawrence Erlbaum Associates, Inc; Hillsdale, NJ, England: 1997.

Baer JS, Kivlahan DR, Marlatt GA. High-risk drinking across the transition from high school to college. Alcoholism: Clinical and Experimental Research. 1995; 19:54–61.

Bedard-Gilligan M, Kaysen D, Desai S, Lee CM. Alcohol-involved assault: Associations with posttrauma alcohol use, consequences, and expectancies. Addictive Behaviors. 2011; 36(11):1076–1082. [PubMed: 21813246]

Compas BE, Wagner BM, Slavin LA, Vannatta K. A prospective study of life events, social support, and psychological symptomatology during the transition from high school into college. American Journal of Community Psychology. 1986; 14(3):241–257. [PubMed: 3739977]

Curran PJ, Muthén BO. The application of latent curve analysis to testing developmental theories in intervention research. American Journal of Community Psychology. 1999; 27(4):567–595. Special issue: Prevention science, part 1. [PubMed: 10573835]

Crawford JR, Henry JD. The Depression Anxiety Stress Scales: Normative data and latent structure in a large non-clinical sample. British Journal of Clinical Psychology. 2003; 42:111–131. [PubMed: 12828802]

Del Boca FK, Darkes J, Greenbaum PE, Goldman MS. Up Close and Personal: Temporal Variability in the Drinking of Individual College Students During Their First Year. Journal of Consulting and Clinical Psychology. 2004; 72(2):155–164. [PubMed: 15065951]

Goldman MS, Boyd GM, Faden V. College drinking, what it is, and what to do about it: a review of the state of the science. Journal of Studies on Alcohol. 2002; 14(Suppl):1–250.

Ham LS, Hope DA. College students and problematic drinking: A review of the literature. Clinical Psychology Review. 2003; 23(5):719–759. [PubMed: 12971907]

Hingson R, Heeren T, Winter M, Wechsler H. Magnitude of alcohol-related mortality and morbidity among U.S. college students aged 18-24: Changes from 1998-2001. Annual Review of Public Health. 2005; 26:259–279.

Hu L, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. Structural Equation Modeling. 1999; 6(1):1–55.

Humphrey JA, White JW. Women's vulnerability to sexual assault from adolescence to young adulthood. Journal of Adolescent Health. 2000; 27:419–424. [PubMed: 11090744]

Kassel JD, Jackson SI, Unrod M. Generalized expectancies for negative mood regulation and problem drinking among college students. Journal of Studies on Alcohol. 2000; 61:332–340. [PubMed: 10757145]

Kaysen D, Neighbors C, Martell J, Fossos N, Larimer ME. Incapacitated rape and alcohol use: A prospective analysis. Addictive Behaviors. 2006; 31(10):1820–1832. [PubMed: 16446044]

Kilpatrick DG, Acierno R, Resnick HS, Saunders BE, Best CL. A 2-year longitudinal analysis of the relationships between violent assault and substance use in women. Journal of Consulting and Clinical Psychology. 1997; 65(5):834–847. [PubMed: 9337502]

Kilpatrick, DG.; Saunders, BE.; Smith, DW. Youth victimization: Prevalence and implications – Research in Brief. Office of Justice Programs, National Institute of Justice; Washington, D. C.: 2003.

Kline, Rex B. Principles and practice of structural equation modeling. 2nd. Guilford Press; New York, NY, US: 2005.

LaBrie JW, Ehret PJ, Hummer JF, Prenovost K. Poor adjustment to college life mediates the relationship between drinking motives and alcohol consequences: A look at college adjustment, drinking motives, and drinking outcomes. Addictive Behaviors. 2012; 37(4):379–386. [PubMed: 22177614]

Larimer ME, Lydum AR, Anderson BK, Turner AP. Male and female recipients of unwanted sexual contact in a college student sample: Prevalence rates, alcohol use, and depression symptoms. Sex Roles. 1999; 40:295–308.

Miranda R Jr. Meyerson LA, Long PJ, Marx BP, Simpson SM. Sexual assault and alcohol use: Exploring the self-medication hypothesis. Violence and Victims. 2002; 17:205–217. [PubMed: 12033555]

Montgomery, MJ.; Côté, JE. College as a transition to adulthood. In: Adams, GR.; Bersonsky, MD., editors. Handbook of Adolescence. Blackwell Publishing; Malden, MA: 2006. p. 149-172.Handbook of adolescence

Muthén, LK.; Muthén, BO. Mplus User's Guide. Sixth. Muthén & Muthén; Los Angeles, CA: 1998-2010.

Neighbors C, Atkins DC, Lewis MA, Lee CM, Kaysen D, Mittmann A, Fossos N, Rodriguez LM. Event-specific drinking among college students. Psychology of Addictive Behaviors. 2011; 25(4): 702–707. [PubMed: 21639597]

O'Connor RM, Colder CR. Predicting alcohol patterns in first-year college students through motivational systems and reasons for drinking. Psychology of Addictive Behaviors. 2005; 19(1): 10–20. [PubMed: 15783273]

O'Malley PM, Johnston LD. Epidemiology of alcohol and other drug use among American college students. Journal of Studies on Alcohol. 2002; S14:23–39.

Park CL, Levenson MR. Drinking to cope among college students: Prevalence, problems, and coping processes. Journal of Studies on Alcohol and Drugs. 2002; 63(4):486–497.

Read JP, Colder CR, Merrill JE, Ouimette P, White J, Swartout A. Trauma and posttraumatic stress symptoms predict alcohol and other drug consequence trajectories in the first year of college. Journal of Consulting and Clinical Psychology. 2012; 80(3):426–439. [PubMed: 22545739]

Reed E, Amaro H, Matsumoto A, Kaysen D. The relation between interpersonal violence and substance use among a sample of university students: Examination of the role of victim and perpetrator substance use. Addictive Behaviors. 2009; 34:316–318. [PubMed: 19028021]

Resnick HS, Acierno R, Kilpatrick DG. Health impact of interpersonal violence: II. Medical and mental health outcomes. Behavioral Medicine. 1997; 23(2):65–78. [PubMed: 9309346]

Satorra A, Bentler PM. A scaled difference chi-square test statistic for moment structure analysis. Psychometrika. 2001; 66(4):507–514.

Schulenberg, J.; Maggs, JL.; Hurrelmann, K., editors. Health risks and developmental transitions during adolescence. Cambridge University Press; New York: 1997.

Shaver, P.; Furman, W.; Buhrmester, D. Transition to college: Network changes, social skills, and loneliness. In: Duck, S.; Perlman, D., editors. Understanding personal relationships: An interdisciplinary approach. Sage Publications, Inc; Thousand Oaks, CA: 1985. p. 193-219.

Stewart SH, Pihl RO, Conrod PJ, Dongier M. Functional associations among trauma, PTSD and substance-related disorders. Addictive Behaviors. 1998; 23(6):797–812. [PubMed: 9801717]

Stewart SH, Zeitlin SB, Samoluk SB. Examination of a three-dimensional drinking motives questionnaire in a young adult university student sample. Behavior Research & Therapy. 1996; 34:61–71.

Testa M, Hoffman JH, Livingston JA, Turrisi R. Preventing college women's sexual victimization through parent-based intervention: A randomized controlled trial. Prevention Science. 2010; 11:308–318. [PubMed: 20169410]

Testa M, Livingston JA. Alcohol consumption and women's vulnerability to sexual victimization: Can reducing women's drinking prevent rape? Substance Use & Misuse. 2009; 44:9–10. Special issue: Substance misuse and aggression, 1349-1376.

Tjaden, P.; Theonnes, N. Full report of the prevalence, incidence, and consequences of violence against women: Findings from the national violence against women survey. U.S. Department of Justice Office of Justice Programs; Washington, DC: 2000.

Tjaden, P.; Thoennes, N. Extent, nature, and consequences of rape victimization: Findings from the national violence against women survey. U.S. Department of Justice, National Institute of Justice; Washington, DC: 2006.

Tucker LR, Lewis C. A reliability coefficient for maximum likelihood factor analysis. Psychometrika. 1973; 38(1):1–10.

Walsh K, Danielson CK, McCauley J, Hanson RF, Smith DW, Resnick HS, Saunders BE, Kilpatrick DG. Longitudinal trajectories of posttraumatic stress disorder symptoms and binge drinking among adolescent girls: The role of sexual victimization. Journal of Adolescent Health. 2012; 50(1):54–59. [PubMed: 22188834]

Wechsler H, Dowdall GW, Davenport A, Castillo S. Correlates of college student binge drinking. American Journal of Public Health. 1995; 85:921–926. [PubMed: 7604914]

Wood MD, Read J, Palfai TP, Stevenson JF. Social influence processes and college student drinking: The mediational role of alcohol outcome expectations. Journal of Studies on Alcohol. 2001; 62(1): 32–43. [PubMed: 11271962]
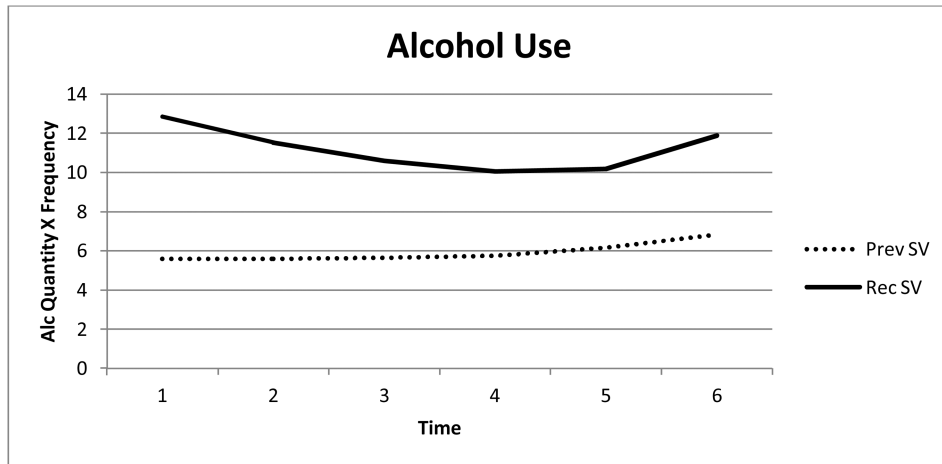
Figure 1. Model Implied Means for Alcohol Use
Plotted model implied trajectories for alcohol use (quantity × frequency index) across the first year of college.
Note. Alc = Alcohol, Prev SV = Previous sexual victimization, Rec SV = Recent sexual victimization
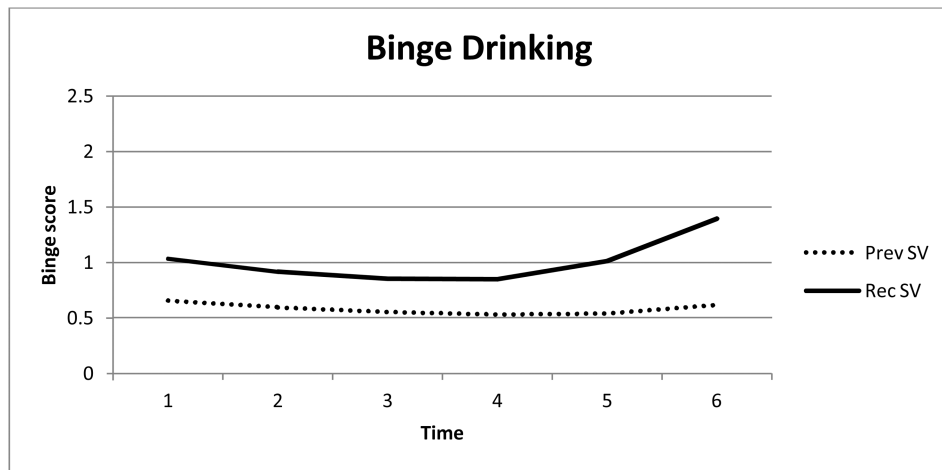
Figure 2. Model Implied Means for Binge Drinking
Plotted model implied trajectories for number of binge drinking episodes per month across the first year of college.
Note. Prev SV = Previous sexual victimization; Rec SV = Recent sexual victimization.
Binge score does not reflect the number of binge drinking episodes, please refer to Measures section for scale scoring.

Table 1

Alcohol Use and Binge Drinking Across Freshman Year

Outcome variable	Recent SV M (SD)	Previous SV M (SD)	t	p
Alc use T1	11.80 (12.6)	6.56 (8.6)	−2.56	.013[*]
Alc use T2	10.95 (12.0)	6.40 (7.8)	−2.35	.022[*]
Alc use T3	10.46 (12.0)	5.99 (7.8)	−2.22	.031[*]
Alc use T4	6.78 (9.7)	5.78 (7.5)	−.58	.567
Alc use T5	12.74 (14.0)	6.91 (8.7)	−2.43	.019[*]
Alc use T6	12.40 (14.6)	6.36 (9.2)	−2.38	.022[*]
Binge T1	1.23 (1.4)	.65 (1.1)	−2.51	.015[*]
Binge T2	1.07 (1.5)	.65 (1.0)	−1.74	.088 [±]
Binge T3	1.02 (1.3)	.59 (1.1)	−1.88	.065 [±]
Binge T4	.70 (1.2)	.48 (0.9)	−1.04	.30
Binge T5	1.26 (1.4)	.64 (1.1)	−2.42	.019[*]
Binge T6	1.22 (1.4)	.57 (1.1)	−2.53	.015[*]

[*] p<.05;

[**] p±.01;

[±] p<.10