Leisure Activities, the Social Weekend, and Alcohol Use: Evidence From a Daily Study of First-Year College Students

ANDREA K. FINLAY, PH.D.,^{a,*} NILAM RAM, PH.D.,^a JENNIFER L. MAGGS, PH.D.,^a AND LINDA L. CALDWELL, PH.D.^b

^aDepartment of Human Development and Family Studies, The Pennsylvania State University, University Park, Pennsylvania

^bDepartment of Recreation, Park and Tourism Management, The Pennsylvania State University, University Park, Pennsylvania

ABSTRACT. Objective: The aim of this study was to document within-person and between-persons associations between the duration of day-to-day activities (volunteering, spiritual activities, media use, socializing, entertainment/campus events and clubs, athletics, classes, working for pay) and alcohol use (quantity and heavy drinking) and to examine whether these associations differed by gender and the time of week. **Method:** First-semester college students ($N = 717$ persons; 51.6% female) provided up to 14 consecutive days of data ($N = 9,431$ days) via daily web-based surveys. Multilevel analyses tested whether alcohol use was associated with activity duration, gender, and time of week. **Results:** Between-persons associations indicated that alcohol use was higher

among individuals who spent more time involved in athletics and socializing and lower among students who spent more time in spiritual and volunteer activities. Within-person associations indicated that students consumed more alcohol and were more likely to drink heavily on weekends, on days they spent more time than usual socializing, and on days they spent less time than usual in spiritual activities and using media. **Conclusions:** Select activities and days were linked with less alcohol use at both the between- and within-person levels, suggesting that attention should be paid to both selection effects and social context to understand the mechanisms linking activity duration and student drinking. (*J. Stud. Alcohol Drugs*, 73, 250–259, 2012)

ALCOHOL USE IS A COMMON PART OF the college experience. In a nationally representative sample, more than 65% of students reported drinking alcohol in the prior 30 days, and more than 40% reported consuming five or more drinks in a row (heavy drinking) sometime in the prior 2 weeks (Johnston et al., 2008). Heavy alcohol use by students is associated with tremendous costs to individuals and society, including absenteeism and lower grades, drunk-driving accidents, assaults, and alcohol-related deaths (Hingson et al., 2005; Miller et al., 2006; Higher Education Center for Alcohol and Other Drug Abuse and Violence Prevention, 2008). Changing the culture of heavy drinking on college campuses is a valued priority of alcohol and developmental researchers, prevention scientists, and college administrators (Amethyst Initiative, 2010; National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2009).

Understanding the context of alcohol consumption is important to prevention and risk-reduction efforts, including understanding patterns of college students'

time use throughout the week and whether alcohol use is linked with participation in specific activities. Recently, Patrick et al. (2010) demonstrated that first-year college students consumed fewer drinks on weekend nights when they attended alcohol-free university-sponsored activities compared with weekend nights when they went out to bars, parties, sporting events, or other entertainment or campus events. Such findings support recommendations of the NIAAA's (2009) College Drinking Prevention Task Force for reducing college drinking and changing campus drinking cultures—specifically, to develop alcohol-free activities/events during prime social times (i.e., weekend late nights). Participation in some activities such as volunteering is associated with less alcohol use (Weitzman and Kawachi, 2000), but other activities such as sports involvement and membership in a social fraternity or sorority are associated with higher rates of alcohol use (Sher et al., 2001; Turrissi et al., 2007).

College student activity involvement

College students are involved in a variety of activities on any given day, including nonleisure activities, such as school and work, and leisure activities, such as socializing and playing sports. Academic obligations account for a substantial portion of students' time: Three-quarters of students attend class for 11 or more hours per week, although 70% skip class occasionally or frequently (Liu et al., 2008). Leisure activities account for more than 40 hours

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*Correspondence may be sent to Andrea K. Finlay at the Department of Human Development and Family Studies, The Pennsylvania State University, S-110 Henderson Building, University Park, PA 16802, or via email at: akf134@psu.edu.

per week of students' time outside of class, studying, and paid work (Brint and Cantwell, 2008). Beyond socializing and sports, other common leisure behaviors include volunteering and spiritual engagement (Marcelo, 2007; Spirituality in Higher Education, 2004). Measured on a daily level, national data indicate that, on the average weekday, full-time college students spend 3.9 hours in leisure and sports activities, 3.2 hours in educational activities, and 3.0 hours working for pay (U.S. Bureau of Labor Statistics, 2007).

Serious and casual leisure. Stebbins' (2001) conceptual model of leisure activity distinguishes two kinds of leisure. Serious leisure includes activities (e.g., amateur sports participation) characterized by long-term commitments to developing skills through overcoming challenges (e.g., learning difficult skills). For example, volunteering is considered a serious leisure activity, because it is a sustained activity with a focused goal and often requires a commitment to learning new skills. Individuals derive deep satisfaction from involvement in serious leisure activities. In contrast, casual leisure activities require little skill and are considered pleasurable (e.g., watching television, "hanging out" with friends). For instance, hanging out with friends is considered casual leisure because little time commitment or skill is involved. Hallmarks of both serious and casual leisure are that the activities are intrinsically rewarding and enjoyable and offer an escape from or an alternative to nonleisure activities such as work or worklike activities (e.g., school). Alcohol use, with its focus on sociability, pleasure, and low skill or commitment, represents casual leisure (Shinew and Parry, 2005) and may overlap (conceptually or in time) with other casual leisure activities.

Leisure activities and alcohol use

Among adolescents and traditional-age college students, serious leisure activities (aside from athletics) are associated with lower alcohol use, whereas casual activities are linked to greater alcohol use. For example, volunteering was associated with less drunkenness and heavy drinking (defined as consuming five or more drinks for men and four or more drinks for women at least once in the past 2 weeks) among college students (Weitzman and Chen, 2005; Weitzman and Kawachi, 2000). Similarly, among adolescent girls (but not boys), church attendance was linked with lower frequency of drinking (Vicary et al., 1998). In contrast, casual leisure activities, such as spending the night out for fun, were associated with higher alcohol quantity and heavy drinking among high school seniors (Bachman et al., 2002). Likewise, membership in a social fraternity or sorority, which could be considered casual leisure, predicted heavier drinking among college students (Sher et al., 2001). In sum, participation in serious and casual leisure differentially predicts alcohol use.

Athletic leisure and alcohol use

Athletic leisure (e.g., participating in sports, working out) is a notable exception to the pattern that participation in serious leisure is associated with less alcohol use. Among adolescents and college students, sports participation has been consistently related to higher substance use (Barber et al., 2001; Eccles et al., 2003; Turrissi et al., 2007; Yusko et al., 2008). Examining activity duration, Mahoney and colleagues (2006) found that individuals who participated in sports 15–20 hours per week were more likely to report ever drinking alcohol than those who participated less in sports; however, nonparticipants were the most likely to report ever drinking. Additionally, working out at the gym, when done for extrinsic (e.g., identification, external regulation) rather than intrinsic (e.g., enjoyment of exercising) reasons, is associated with more frequent drinking and getting drunk (Rockafellow and Saules, 2006).

In the Stebbins' (2001) leisure-activity framework, athletic activities include both serious and casual leisure activities. Some athletic leisure pursuits, such as participating in competitive sports teams, require a long-term commitment to skill acquisition and teamwork and may thus be considered serious leisure. However, aerobic activities that require little or no skill, such as working out, are often defined as casual leisure (Stebbins, 2008). Because of a lack of clear consensus on the association between athletic leisure and alcohol use and because athletic leisure can be classified as serious or casual, it is considered here as a separate category of leisure. In previous work, serious leisure predicted less alcohol use and casual leisure predicted more alcohol use, but athletics mostly predicted more alcohol use. Thus, based on this work, we predicted that athletics would be associated with more alcohol use.

Gender differences in activities and alcohol use

Activities and alcohol use vary by gender. Women participate less in intercollegiate athletics and spend more time away from home with friends (casual leisure) than do men (Rockafellow and Saules, 2006). Men, in general, drink more than women and are more likely to engage in heavy drinking (Chen et al., 2004/2005; Dawson et al., 2004; Mohr et al., 2005; White et al., 2006). Gender also moderates links between activities and alcohol use: Adolescent girls consumed alcohol more frequently than boys when their church attendance decreased (Vicary et al., 1998), and boys, but not girls, who volunteered more had a higher frequency of drunkenness (Vieno et al., 2007). In research on college students' daily experiences, leisure activities were associated with more alcohol use for men but not for women. Specifically, on days when students had more positive social contacts (e.g., had good interactions with friends or received a phone call from a friend), men consumed a larger number of drinks at

home (in dormitories or fraternity housing), whereas women drank fewer drinks (Mohr et al., 2005). In sum, there are substantial differences among men and women in activity duration and alcohol use as well as in the links between the two.

Timing of alcohol use

Class schedule and the day of the week may be important contributors to the relationship between activity participation and alcohol use. College students' alcohol use is relatively low on Sundays through Wednesdays, is higher on Thursdays, and peaks on Fridays and Saturdays (Del Boca et al., 2004; Maggs et al., 2011). More drinks are consumed on Thursday nights when students do not have Friday classes or when their classes begin after noon on Fridays (Wood et al., 2007). Although researchers have started examining how college students' alcohol use varies in conjunction with the types of activities they participate in on a given day (Mohr et al., 2005; Patrick et al., 2010), there does not appear to be information on how activity/drinking associations may differ by the time of week. Better understanding of the timing of students' activity and drinking behavior and the time-sensitive nature of links between those behaviors will assist the development of more effective efforts to reduce alcohol misuse among college students. Given day-to-day differences in drinking, in our study we contrast "social weekend" (SWE) days (Thursdays through Saturdays) with weekdays (Sundays through Wednesdays).

Present study

Activity duration usually has been measured at the yearly or semester time scale or aggregated across months and weeks. There is limited information about students' day-to-day duration of activity participation (Darling et al., 2005; Gardner et al., 2008; Hansen and Larson, 2007; Marsh and Kleitman, 2002). The present study addressed these limitations, using 2 weeks of daily reports obtained from a sample of first-year college students (see also Patrick et al., 2010). First, we documented the duration of students' activity participation, the quantity of alcohol consumed, and heavy drinking, as well as how these behaviors differed by gender and the time of week (weekday vs. SWE). Second, we examined associations between students' activity participation (duration) and their alcohol consumption (quantity and heavy drinking). Uniquely, we used data collected across 14 consecutive days to explicitly examine both between-persons (i.e., did individuals who participated in a given activity more or less than other people tend to drink more or less alcohol, on average?) and within-person (i.e., did individuals who participated in an activity more or less on a given day drink more or less on that day?) associations. Between-persons, we hypothesized that students who spent

more time in serious leisure and nonleisure activities would drink less, and individuals who spent more time involved in casual leisure or athletic activities would drink more. Within-person, we hypothesized that alcohol use would be higher on days when students spent less time involved in serious or nonleisure activities and more time involved in casual leisure and athletic activities.

Method

The present study makes use of the first wave of data from the University Life Study, a seven-semester longitudinal web-based study wherein a cohort of students enrolled at a large university completed a web-based questionnaire and a 14-day daily diary each semester (Patrick et al., 2010). The study was approved by the institutional review board and protected by a federal certificate of confidentiality.

Procedure

Data collection commenced in fall 2007 and used a stratified random sampling procedure to recruit a diverse sample of first-time first-semester students (Patrick et al., 2010). Eligible participants were first-year students who were U.S. citizens or permanent residents, resided within 25 miles of the campus, and were younger than age 21. They were stratified with respect to gender and race/ethnicity. Students selected for recruitment were mailed an informational letter, an invitation to participate, a \$5 cash incentive, and a pen. Five days after receiving the letter, each student was sent an email message with an active hyperlink to a web-based survey about a wide range of topics related to student life and health. Of the students initially asked, 66% consented (via online electronic signature) and provided data. The morning following completion of the semester survey, students received an email with an invitation to begin the daily surveys. Each morning for the next 13 days, they received emails with hyperlinks to the daily questionnaire. In addition to the \$5 pre-incentive, participants received \$25 for completing the initial survey, \$3 for each daily survey, and an \$8 bonus for completing all surveys (maximum: \$80).

Participants

The present analytic sample consisted of 717 college students (51.6% women; $M_{age} = 18.45$ years, $SD = 0.43$; 98% lived in on-campus dorms) who completed the initial survey and at least 1 of the 14 daily surveys (96% of initial responders). These individuals provided 9,431 person-days of data on activities and alcohol use in the fall of their first year (94% completion rate for daily data). Twenty-five percent of participants self-reported as Hispanic/Latino(a), and, among the remainder, 27% of the sample were European American, 23% Asian American, 16% African American, and 9% mul-

tiracial; 58% of students' mothers and 61% of fathers had completed college.

Measures

Activity duration. Fifteen items assessed the amount of time students spent in typical campus activities each day. Prompted with "From the time you woke up until you went to sleep, how much time did you spend doing the following activities?" participants indicated the duration of participation in each of 15 activities on a 10-category response scale: *did not do* (recoded to 0 hours of participation), *up to 30 minutes* (0.25 hours), *30–60 minutes* (0.75), *1–2 hours* (1.5), *2–3 hours* (2.5), *3–4 hours* (3.5), *4–6 hours* (5.0), *6–8 hours* (7.0), *8–10 hours* (9.0), and *10 hours or more* (10.0). Following Eccles and Barber (1999), subsets of items were summed to indicate the amount of time per day spent in eight serious, casual, athletic, and nonleisure activities (indicated by *italics*). Serious leisure included *volunteering* and *spiritual* (praying, meditating) activities. Casual leisure included *media use* (playing video/computer games, watching television, reading a book/magazine for pleasure, surfing the web), *socializing* (eating/having coffee with friends, spending time with a romantic partner, hanging out with friends), and attending *events* (sports/concert/movie/entertainment events, campus events/clubs). *Athletics* included sports and working out, and nonleisure activities were *class attendance* and *working for pay*.

Alcohol use. *Alcohol quantity* was assessed daily by asking students, "How many drinks of alcohol did you drink?" on the previous day, with the response selected from a drop-down menu with 27 possible responses: 0, 1, 2, . . . 25, more than 25 drinks. *Heavy drinking* was defined as having consumed four or more drinks (for women) or five or more drinks (for men), where 0 = no or not-heavy drinking and 1 = heavy drinking (Dawson et al., 2004).

Gender and the time of week. *Gender* was coded as 0 = female, 1 = male. *Time of week* was defined similarly to other studies of college student drinking (Del Boca et al., 2004; Lee et al., 2006), contrasting weekdays (0 = Sunday through Wednesday) with SWE days (1 = Thursdays, Fridays, and Saturdays). Based on this definition, some class attendance activities occurred on days defined as SWE days (i.e., Thursdays, Fridays).

Data analysis

The first step in the analyses was to describe levels of activity duration and alcohol use and to test whether these differed by gender and the time of week. Generalized multilevel models (Raudenbush and Bryk, 2002) were used to quantify differences across gender and the time of week and to test for moderation of time-of-week differences by gender, while accommodating the nested structure of the

data, with days (up to 14 days per person; $N = 9,431$ days) nested within persons ($N = 717$). Subsequently, the models of alcohol use (separate models for alcohol quantity and heavy-drinking outcome variables) were expanded and specifically constructed to examine both between-persons and within-person associations between activity involvement and alcohol use. In brief, we regressed daily alcohol quantity and heavy drinking on the eight activity-duration measures (split into within and between components), the time of week, gender, the two-way interaction between gender and the time of week, and two-way interactions between each activity-duration variable and the time of week.

All models were estimated using HLM 6.04 (Raudenbush and Bryk, 2002), with missing data treated as missing at random (Little and Rubin, 1987). The count nature of the alcohol quantity variable and the large number of days with zero drinks were accommodated using a Poisson distribution for the residuals and an overdispersion parameter (Snijders and Bosker, 1999). The binary nature of heavy drinking was accommodated using a Bernoulli distribution.

Results

Activity duration

On a typical day, students (i.e., men and women combined) spent the most time in two casual leisure activities—socializing ($M = 3.32$ hours, $SD = 3.19$) and media use ($M = 2.21$ hours, $SD = 2.07$)—and in the nonleisure activity of attending class ($M = 3.13$ hours, $SD = 2.55$). Students spent the least amount of time in the serious leisure pursuits of volunteering ($M = 0.06$ hours, $SD = 0.44$) and spiritual activities ($M = 0.13$ hours, $SD = 0.46$).

The average amount of time women and men spent engaged in each of the eight categories of activities is displayed in Figure 1 (with descriptives for women appearing in the upper panel and for men in the lower panel), with formal evaluation of the gender and time-of-week differences in activity duration presented in Table 1. On a typical day, women spent more time than men socializing ($\gamma = -0.10$, $SE = 0.05$), attending events ($\gamma = -0.34$, $SE = 0.11$), and attending class ($\gamma = -0.21$, $SE = 0.03$), whereas men spent more time than women in media use ($\gamma = 0.32$, $SE = 0.05$) and athletics ($\gamma = 0.68$, $SE = 0.10$). On average, on SWE days students spent more time socializing ($\gamma = 0.40$, $SE = 0.02$), attending events ($\gamma = 0.81$, $SE = 0.05$), and working for pay ($\gamma = 0.26$, $SE = 0.06$) than on weekdays. In contrast, on weekdays students spent more time in athletics ($\gamma = -0.30$, $SE = 0.05$) and going to class ($\gamma = -0.43$, $SE = 0.02$) than on SWE days. Gender moderated only two time-of-week differences: women tended to socialize more on SWE days than did men ($\gamma = -0.12$, $SE = 0.02$), and men tended to engage in athletics more on SWE days than did women ($\gamma = 0.15$, $SE = 0.07$).

FIGURE 1. Mean duration of students' participation in eight types of activities across weekdays and social weekend (SWE; Thursdays–Saturdays) for women (top) and men (bottom)

TABLE 1. Multilevel models of activity duration examining gender and time of week differences

Variable	Serious leisure		Casual leisure				Nonleisure	
	Volunteering	Spiritual	Media use	Socializing	Events	Athletics	Class	Work
Fixed effects								
Intercept	-4.46 (0.20)	-2.87 (0.11)	0.44 (0.04)	0.93 (0.03)	-2.02 (0.08)	-1.77 (0.08)	1.32 (0.02)	-5.98 (0.37)
Male	-0.26 (0.23)	-0.14 (0.14)	0.32* (0.05)	-0.10* (0.05)	-0.34* (0.11)	0.68* (0.10)	-0.21* (0.03)	0.12 (0.40)
SWE	0.10 (0.12)	-0.06 (0.09)	-0.02 (0.02)	0.40* (0.02)	0.81* (0.05)	-0.30* (0.05)	-0.43* (0.02)	0.26* (0.06)
Male $\times$ SWE	0.13 (0.17)	0.00 (0.12)	0.02 (0.03)	-0.12* (0.02)	0.12 (0.08)	0.15* (0.07)	-0.02 (0.03)	-0.06 (0.09)
Random effects								
Variance intercept	4.00 (0.52)	1.86 (0.20)	0.43 (0.03)	0.34 (0.02)	1.22 (0.11)	1.37 (0.11)	0.16 (0.01)	14.04 (1.49)

Notes: Values are unstandardized parameter estimates with standard errors indicated in parentheses. SWE = social weekend (Thursdays–Saturdays).

* $p < .05$.

Alcohol use

Students' alcohol use occurred primarily on SWE days, with 84% of drinks consumed on Thursdays, Fridays, or Saturdays. As expected, more drinks were consumed on the average SWE day ($M = 1.35$ drinks, $SD = 3.07$) than on the average weekday ($M = 0.15$, $SD = 1.10$) ($b = 1.19$, $SE = 0.04$). Examining across day averages, men ($M = 0.80$, $SD = 2.64$) consumed more drinks than women ($M = 0.53$, $SD = 1.82$) ($b = 0.30$, $SE = 0.08$). Men's and women's alcohol quantities were similarly low on weekdays (women: $M = 0.10$, $SD = 0.89$; men: $M = 0.20$, $SD = 1.30$), but on the average SWE day, men ($M = 1.61$, $SD = 3.59$) consumed more drinks than women ($M = 1.11$, $SD = 2.47$) ($b = 0.39$, $SE = 0.08$).

Students reported heavy drinking on approximately 1 in 14 days, with 88% of these heavy drinking days falling on a Thursday, Friday, or Saturday. On average, students were more likely to engage in heavy drinking on SWE days than on weekdays ($b = 3.16$, $SE = 0.20$). There was no gender difference in the probability of heavy drinking and no significant interaction between gender and the time of week. That is, in this sample, women and men were just as likely to engage in heavy drinking—based on the gender-specific definition—and this did not differ by the time of week.

Associations between activity duration and alcohol use

Results from our examination of between-persons and within-person associations are displayed in Table 2. First, concerning between-persons differences, men (on average) consumed a larger number of drinks than did women ($\gamma = 0.78$, $SE = 0.20$). Students who spent more time than their peers in volunteering ($\gamma = -0.54$, $SE = 0.25$) and spiritual activities ($\gamma = -1.02$, $SE = 0.39$) or in the nonleisure activities of going to class ($\gamma = -0.18$, $SE = 0.04$) and working for pay ($\gamma = -0.52$, $SE = 0.12$) tended to consume less alcohol. In contrast, students who spent more time socializing ($\gamma = 0.13$, $SE = 0.02$) or in athletics ($\gamma = 0.55$, $SE = 0.08$) tended to consume more drinks than students who spent less time involved in these activities.

An almost identical pattern of between-persons associations was observed for heavy drinking. Students who spent more time in spiritual activities ($\gamma = -2.25$, $SE = 0.69$) and going to class ($\gamma = -0.24$, $SE = 0.08$) or working for pay ($\gamma = -0.69$, $SE = 0.22$) were less likely to engage in heavy drinking. Individuals who spent more time socializing ($\gamma = 0.19$, $SE = 0.06$) or in athletics ($\gamma = 0.82$, $SE = 0.20$) were more likely to drink heavily. In contrast to the model of alcohol quantity, there were no notable differences in heavy drinking as a function of gender or volunteering.

The within-person analyses provided information about associations of day-to-day activity duration with day-to-day differences in alcohol use. Students consumed a larger number of drinks on SWE days ($\gamma = 2.61$, $SE = 0.14$); this was particularly true for women ($\gamma = -0.42$, $SE = 0.18$). In contrast to the between-persons results, only a few activities predicted fluctuations in alcohol use. On weekdays, when students spent more time in spiritual activities ($\gamma = -2.36$, $SE = 0.60$), they tended to consume fewer drinks. However, the protective effect of spending time in spiritual activities was effectively removed by the moderating time-of-week effect ($\gamma = 2.39$, $SE = 0.60$). For casual leisure activities, results varied by activity. On days when students socialized more, they tended to consume more drinks ($\gamma = 0.07$, $SE = 0.02$). However, on days when students spent more time in media use, they tended to consume fewer drinks ($\gamma = -0.12$, $SE = 0.05$). An Athletics $\times$ SWE interaction indicated that, within-person, greater engagement in athletics was associated with lower alcohol consumption on SWE days but not on weekdays ($\gamma = -0.24$, $SE = 0.09$).

Within-person differences in heavy drinking were similar to those for alcohol quantity. Students were more likely to report heavy drinking on SWE days ($\gamma = 3.55$, $SE = 0.31$). On days students had greater media use, they had a lower likelihood of heavy drinking ($\gamma = -0.21$, $SE = 0.08$). On SWE days, athletics were associated with a lower probability of heavy drinking ($\gamma = -0.31$, $SE = 0.16$). In contrast to alcohol quantity, spiritual activity duration was not significantly associated with fluctuations in heavy drinking. Of note, the same pattern of results emerged

TABLE 2. Multilevel models of alcohol use as a function of activity duration, gender, and time of week

Variable	Alcohol quantity		Heavy drinking	
	γ (SE)	exp.(γ)	γ (SE)	exp.(γ)
Fixed effects				
Intercept	-2.73 (0.14)	0.07	-6.52 (0.34)	0.00
Male	0.78* (0.20)	2.18	0.44 (0.34)	1.55
Volunteering, PM	-0.54* (0.25)	0.58	-1.31 (0.82)	0.27
Spiritual, PM	-1.02* (0.39)	0.36	-2.25* (0.69)	0.11
Media use, PM	-0.05 (0.04)	0.95	-0.01 (0.08)	0.99
Socializing, PM	0.13* (0.02)	1.14	0.19* (0.06)	1.21
Events, PM	-0.08 (0.13)	0.92	0.01 (0.30)	1.01
Athletics, PM	0.55* (0.08)	1.73	0.82* (0.20)	2.27
Going to class, PM	-0.18* (0.04)	0.84	-0.24* (0.08)	0.79
Working for pay, PM	-0.52* (0.12)	0.59	-0.69* (0.22)	0.50
<i>SWE</i>	2.61* (0.14)	13.60	3.55* (0.31)	34.81
<i>Volunteering</i>	0.19 (0.17)	1.21	0.24 (0.26)	1.27
<i>Spiritual</i>	-2.36* (0.60)	0.09	-3.05 (1.63)	0.05
<i>Media use</i>	-0.12* (0.05)	0.89	-0.21* (0.08)	0.81
<i>Socializing</i>	0.07* (0.02)	1.07	0.08 (0.05)	1.08
<i>Events</i>	-0.06 (0.13)	0.94	-0.29 (0.30)	0.75
<i>Athletics</i>	0.10 (0.08)	1.11	0.06 (0.15)	1.06
<i>Going to class</i>	0.04 (0.03)	1.04	0.03 (0.06)	1.03
<i>Working for pay</i>	-0.20 (0.13)	0.82	-0.55 (0.56)	0.58
<i>Male × SWE</i>	-0.42* (0.18)	0.66	-0.36 (0.30)	0.70
<i>Volunteering × SWE</i>	-0.18 (0.17)	0.84	-0.29 (0.31)	0.75
<i>Spiritual × SWE</i>	2.39* (0.60)	10.91	3.15 (1.62)	23.34
<i>Media use × SWE</i>	0.04 (0.04)	1.04	0.06 (0.08)	1.06
<i>Socializing × SWE</i>	-0.02 (0.02)	0.98	0.00 (0.05)	1.00
<i>Events × SWE</i>	0.07 (0.13)	1.07	0.27 (0.30)	1.31
<i>Athletics × SWE</i>	-0.24* (0.09)	0.79	-0.31* (0.16)	0.73
<i>Going to Class × SWE</i>	-0.06 (0.03)	0.94	-0.09 (0.06)	0.91
<i>Working for Pay × SWE</i>	0.02 (0.14)	1.02	0.24 (0.57)	1.27
Random effects				
Variance of intercept, σ^2_{u0}		1.89		3.28
Residual variance, σ^2_{et}		2.36		—

Notes: Within-person effects are listed in *italics*. γ = estimated parameter values; SE = standard error; exp.(γ) = exponentiated parameter values for ease of interpretation; PM = person-means; SWE = social weekend (Thursdays–Saturdays).

* $p < .05$.

when setting aside “abstainers” who did not consume any alcohol during the study period. (Specifics of these and other follow-up analyses are available from the authors.)

Discussion

Social scientists have long asserted that some leisure activities are linked with positive outcomes and some with negative outcomes (Astin, 1999; Bachman et al., 2002; Bohnert et al., 2007; Brint and Cantwell, 2008). The present study documents that college student activities are linked with alcohol consumption and heavy drinking across people and across days. Based on participants’ daily reports of activity duration and alcohol use recorded over 14 days, the results provide a detailed account of how students spent their time on both weekdays and SWE days. Indeed, participation in a variety of serious, casual, athletic, and nonleisure activities was associated with alcohol consumption and heavy drinking. Although particular activities were generally associated with variations in alcohol use, the time of week

appeared to be extremely powerful, often overriding the protective effects provided by participation in particular activities (e.g., spiritual activities).

Activity duration

The current study expands previous research on students’ daily activities by providing a detailed picture of the duration of involvement in eight types of activities across 2 full weeks. Students spent the most time in casual leisure activities including socializing and media use and in the nonleisure activity of attending class. Although mostly congruent with national statistics on students’ daily time use (U.S. Bureau of Labor Statistics, 2007), a notable difference was that our full-time, residential campus sample spent little time in paid labor activities during these 14 days. This discrepancy may reflect differences in socioeconomic status, the limited availability of employment opportunities in a small town, or the first-semester transitional status of the students.

In line with previous reports (Mohr et al., 2005; Murphy et al., 2007; Rockafellow and Saules, 2006), our analysis of activity durations suggests that women and men prioritize activities differently. Women spent more time than men attending class (nonleisure) and socializing and attending events (casual leisure), whereas men spent more time in the casual leisure activity of media use and in athletics, similar to some prior research (Mohr et al., 2005; Rockafellow and Saules, 2006). These gender differences may reflect different motivations or perceived opportunities and also may lead to varied college experiences as well as differential links between activities and alcohol use (Murphy et al., 2007). One implication is that campus activity programming should consider if and how planned events may differentially attract men and women (Patrick et al., 2010).

Alcohol use

As with other college student samples (Del Boca et al., 2004; Maggs et al., 2011), students consumed the most alcohol on Thursdays, Fridays, and Saturdays. Additionally, commonly observed gender differences (Mohr et al., 2005) were seen. Men consumed significantly more drinks than women. However, we did not find the typically noted differences between men and women for heavy drinking (Chen et al., 2004/2005; Dawson et al., 2004; White et al., 2006). There are a few possible explanations for this lack of a difference. First, historical changes in social roles have led to gender convergence in alcohol use (e.g., drunkenness) and in heavy drinking among adolescents, college students, and the general population (Holmila and Raitasalo, 2005; Kuntsche et al., 2011; McPherson et al., 2004). Second, we used a gender-specific measure of heavy drinking that is designed to take into account differences in metabolism and body weight between men and women (Wechsler et al., 1995). Third, we speculated that the social roles of full-time students residing on campus are extremely similar for women and men (e.g., single, full-time student, traditional age, without children). The opportunities or pressures to engage in heavy drinking may be very similar in the early years of college but may diverge as these students move into young adulthood and begin to adopt adult social roles.

Associations between activity duration and alcohol use

In line with our hypotheses, activity duration was associated with fluctuations in drinking across days. At the between-persons level, serious leisure and nonleisure activities were negatively linked with alcohol quantity and heavy drinking. Consistent with previous research, students who engaged in volunteering and spiritual activities (Vicary et al., 1998; Weitzman and Chen, 2005; Weitzman and Kawachi, 2000) and who spent more time going to class

(Wood et al., 2007) consumed less alcohol. Future research may benefit from looking more closely at activities that span across leisure categories (e.g., highly competitive athletics require commitment to a long-term goal and may include paid compensation) to better understand underlying mechanisms. At the within-person level, only the serious leisure activity of spirituality was linked with lower alcohol consumption, although only on weekdays. In previous research, although not examined at the daily level, adolescent girls who decreased their church attendance consumed alcohol more frequently (Vicary et al., 1998). Those findings and ours suggest that spiritual activities may serve as a protective factor. However, as we found the reverse effect on the SWE, social-contextual expectations of drinking on the SWE may be sufficiently strong to overwhelm the potential protective benefits of serious leisure activities.

Casual leisure activities were hypothesized to be associated with a larger number of drinks consumed and heavy drinking, but results were mixed. Consistent with prior research (Bachman et al., 2002; Mohr et al., 2005), both between- and within-person analyses indicated that socializing was associated with more drinking. However, on days when individuals spent more time involved in media use, they consumed fewer drinks and were less likely to engage in heavy drinking. This negative within-person association between media and alcohol use may be because of these activities' location and purpose. Media use is often a solitary activity or occurs in smaller, quieter group settings with the focus on, for example, watching television or checking email. Socializing occurs in groups, is geared toward having fun, and is intrinsically linked with drinking, at least some of the time for many in this population. Similarly, the settings available to first-year students living in on-campus housing where media such as film, television, and computers are most typically accessed have policies in place that prohibit alcohol use in those locations.

Athletics, which included sports and working out, was hypothesized to be linked with higher levels of alcohol use. However, our results are consistent with a hypothesis that physical activities may both attenuate and elevate alcohol use. As in previous research (Turrisi et al., 2007; Yusko et al., 2008), our between-persons analysis indicated that individuals who were more involved in athletics consumed more drinks and were more likely to engage in heavy drinking. In contrast, within-person analyses indicated that on the SWE days that students spent more time than usual in athletics, they consumed less alcohol. More research is needed to better understand these associations (e.g., whether between-persons links are because of stable selection factors). If time spent in athletic pursuits competes during weekends for time spent drinking, then promoting opportunities for physical activity on weekends (e.g., late-night gym opening and events) could help reduce alcohol use. Understanding students' motivations for engaging

in particular activities may help explain these results. For example, students may exercise during the week in anticipation of drinking activities on the weekend, or they may seek out athletic facilities on weekends as an alternative to drinking. Future research might examine in more detail the pathways through which athletic activity affects drinking behavior and why the results vary by the time of week, particularly as athletics contribute to positive health and prevention of obesity.

Notably, answers to the question “Do individuals who participate in a specific activity more or less than other people tend to drink more or less alcohol?” (between-persons associations) were not necessarily the same as answers to the question “Is more or less participation than usual in a specific activity associated with drinking more or less on that day?” Spiritual activities, socializing, and athletics were associated with alcohol use at both between-persons and within-person levels. In contrast, going to class, working, and volunteering reflected more “trait-like” associations with alcohol use at the between-persons level, whereas media use and interactions between spiritual activities and athletics and the SWE reflected more “state-like” associations with alcohol use at the within-person level. One implication is that programmatic events that institutions might create as part of their prevention efforts might attract only particular subpopulations (e.g., students who volunteer more) and never reach or change the behavior of some at-risk groups. A complementary interpretation is that activity-specific events (e.g., athletics) held at the specific times when students are at risk (e.g., SWE) might influence drinking at a more molecular level, guiding “at-risk” individuals toward less risky behaviors at the specific times they need to make responsible choices.

Limitations and outlook

Along with the strengths of our study design, daily data, and repeated measures response rate (94% completion rate for the daily data), there are some limitations to be noted. As is common, the single-campus sample limits generalization. Groups of young people who were not represented in this study include urban college and noncollege populations, students attending community or commuter colleges without on-campus residences, and nontraditional (e.g., older, part-time) students. Despite these omissions, the results should be highly useful when considering the behavior of many college students, especially those also located in rural areas and smaller towns and cities (e.g., many U.S. land-grant institutions and private colleges).

Although the study design provided for a detailed description of daily behavior, the data were self-reports and subject to individuals’ over- or underestimation of time spent in activities or number of drinks consumed. The design did not include assessment of the specific cognitive, emotional,

motivational, or biological processes (e.g., social support, skill development) that contribute to activity selection and participation or detailed information about the specific social and physical contexts in which activity involvement occurred—information that could inform the causal direction of associations between activity and drinking. Understanding those processes is important for developing programs to reduce risky drinking. Research is now needed that delves into why particular activities (e.g., socializing), at particular times (e.g., weekends), for particular persons (e.g., women), in particular contexts (e.g., at home) are associated with reduced drinking. We encourage researchers to consider further how intensive assessment of social context can supplement the intensive daily sampling of individual behavior used here. The resulting findings will be extremely useful in developing best practices for institutions seeking to deploy alcohol-free programming that might effectively reduce alcohol use (NIAAA, 2009).

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