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LateNight Penn State Alcohol-Free Programming: Students Drink Less on Days They Participate

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Abstract

Despite the public health importance of alcohol-free social programs for college students, the majority of existing campus strategies have not been empirically evaluated. This study utilized repeated daily reports to examine the association between attendance at campus-led alcohol-free programming and alcohol use on specific days while controlling for individuals' typical rates of use. The current study assessed students' participation in the Late-Night Penn State (LNPS) alcohol-free programming and amount of alcohol use at a daily level, in order to determine whether students consumed less alcohol on days they attended LNPS compared to weekend days they did not attend. First-year college students reported their daily social activity involvement and alcohol use via 14 consecutive daily web-based surveys. Multilevel regression analyses modeled variation in alcohol use on weekend days (N=3,350) nested within people (N=689 people, 51% women). Analyses focused on within-individual differences between nights attending and not attending LNPS, thereby controlling for stable individual differences, measured and unmeasured. Results indicated that students drank less on days they attended LNPS and on days they stayed in (rather than going to bars/parties, other campus events, or entertainment), both especially among women. These results suggest that alcohol-free social programs may be an effective strategy for decreasing alcohol use on days when students attend alcohol-free events rather than going to other events or gatherings.

High rates of alcohol use and alcohol problems on college campuses are a major public health concern (Ham and Hope 2003; Hingson et al. 2005; Perkins 2002). Not only do drinkers sometimes experience severe consequences of their own alcohol use, but many others experience secondary consequences (Perkins 2002). For example, each year about 12% of college students are assaulted by other students who have been drinking (Hingson et al. 2005). As a result, the college drinking task force of the National Institute on Alcohol Abuse and Alcoholism (NIAAA) recommended, as a primary policy goal, increasing the availability of appealing substance-free activities on college campuses to reduce heavy drinking and its related consequences (DeJong and Langford 2002; NIAAA 2002). These options are especially important as students begin their first year of college, in order to help create patterns of free time use that do not entirely depend on alcohol (Borsari et al. 2007). Despite a proliferation of programs designed to reduce alcohol use (Wechsler et al. 2000), the majority have not been empirically evaluated (DeJong and Langford 2002; Toomey et al. 2007; Wechsler et al. 2000). To determine links between participation in alcohol-free programming and alcohol use on one relatively large Northeastern campus in the U.S., the

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current study assessed whether students consumed less alcohol on weekend days they attended LateNight Penn State (LNPS) compared to weekend days they did not attend.

Little is known about whether alternative campus activities actually decrease alcohol use among participants. Empirically evaluating existing programs is a necessary first step toward understanding how alcohol-free activities affect campus environments (Murphy et al. 2007b). Students who spend more time participating in naturally-occurring alcohol-free activities, such as studying, volunteering, and involvement in campus activities (excluding Greek fraternity and sorority activities) report less alcohol use (see Fenzel 2005; Weitzman and Kawachi 2000), but we do not yet know whether this inverse relationship extends to administrator-initiated alcohol-free programs.

Behavioral economic theories highlight the potential influence of the availability and attractiveness of alcohol-free alternative activities on decreases in alcohol use (Correia et al. 2005; Murphy et al. 2007b). This approach posits that college student drinking is affected by the availability and cost of alcohol, the availability and cost of alcohol-free activities, and the relative perceived importance of short-term versus long-term consequences of engaging in or abstaining from alcohol (Murphy et al. 2007b). However, much more work is needed to determine whether alcohol use, including heavy and high-risk alcohol use, is effectively reduced by alcohol-free options on college campuses (Correia et al. 2003).

A routine activity perspective provides insights about the likely impact of alcohol-free alternative activities in terms of the context in which adolescent and young adult alcohol use typically occurs. According to this view, problem behaviors such as substance use and delinquency are most likely to occur during unstructured and unsupervised socializing with peers (Osgood et al. 1996, 2005). Consistent with this reasoning, research shows that underage drinking typically occurs when students go out for evenings of fun and entertainment (e.g., convivial drinking in O'Hare 1997, drinking on evenings out and to have fun with friends in Bachman et al. 2008). Thus, it is appropriate that programs seek to reduce drinking by attracting college students to alcohol-free social settings on such evenings. At the same time, such programs may have less potential for alcohol reduction on evenings that students plan to stay home because they may be less likely to drink on those days anyway. Accordingly, we contrast alcohol use on days that students participate in LNPS to alcohol use on days they go out, and our analyses show how these days compare to days they stay in.

LateNight Penn State (LNPS)

LNPS provides students at The Pennsylvania State University a range of alcohol-free entertainment options during the prime social times of Thursday night (9:00 PM to Midnight), Friday night (9:00 PM to 2:00 AM), and Saturday night (9:00 PM to 2:00 AM). According to the program's website, the goals of the program were to: (1) provide students with alcohol-free alternatives to alcohol-related activities, (2) offer a variety of high-quality programs that will meet the interests of a diverse student body, and (3) encourage student involvement in leadership, planning, and co-sponsoring programs. The majority of activities are provided in the student union building on campus. Events include a range of activities from free movies, music, and comedy acts to board games, video games, and arts and crafts. In 2007, when the present data were collected, programming was organized and funded by Student Affairs. For more information about the program, see Maney et al. (2002a) or www.latenight.psu.edu.

In 1999, as part of the Safe and Drug-Free Schools initiative, the U.S. Department of Education declared LNPS a Model Program (Department of Education 2007), and LNPS has been described as a promising prevention program (Reifman and Watson 2003). Available data suggest LNPS may be an effective strategy, although the designs of previous

evaluations cannot rule out potential selection effects in which individuals who are opposed to or not attracted to drinking or heavy drinking are most likely to attend LNPS. Students who ever participated in LNPS activities were less likely to drink and party heavily compared to students who had never participated (Maney et al. 2002b). According to a 2002 institutional survey (Penn State Student Affairs 2002), the percentage of students who ever participated in LNPS increased from 30% in Fall 1998, to 46% in Spring 2000, to 57% in Fall 2002. In the same survey 66% of those surveyed reported believing that LNPS decreased drinking for attendees. Students endorsed several reasons for attending LNPS, including that it is free (96%), provides an alternative to drinking (95%), offers the comfort of knowing others are not drinking (94%), decreases time to drink (91%), provides an opportunity to bring friends who then do not drink (87%), and includes events that capture their attention (79%). Among the 34% of students who believed that LNPS does not decrease drinking, those surveyed said that somewhat or to a great extent students drink before and after (92%), students will drink on other nights (92%), and students are not interested in the alcohol-free activities (68%). A more recent survey in 2006 found that 85% of Penn State students attended LNPS activities at least once in a semester, 75% reported it was a “cool entertainment option” on weekends, and 25% said it was an alternative to bars (Teng 2006, unpublished, available online).

To date, alcohol-free programs such as LNPS have never been evaluated using within-person daily data to determine whether the same individuals report using less alcohol on weekend days they attend LNPS compared to weekend days they do not attend. Therefore, there is a lack of empirical support for the hypothesis that attending alcohol-free programming such as LNPS inhibits alcohol use on weekend days students attend, compared to other weekend days.

Gender Differences in Alcohol-Free Programming

Available evidence suggests that alcohol-free programming may reduce alcohol use more for women than for men. Several studies show that women report enjoying substance-free activities more than do men (Murphy et al. 2006, 2007a). Men are less likely to participate in alcohol-free activities (Murphy et al. 2006) and less likely to socialize without alcohol (Murphy et al. 2007b). Indeed, the available data regarding LNPS indicates that men were more likely than women to say they never attended because they were not interested in the activities, and men reported consuming more alcohol before and after attending LNPS (Penn State Student Affairs 2002). Murphy et al. (2007a) used timeline follow-back techniques to gather reports of alcohol consumption and enjoyment of naturally-occurring substance-free activities over 30 days. Averaging across days, women who enjoyed substance-free activities tended to drink less, although this analysis did not ascertain whether they used less alcohol on days of substance-free activities, or whether this between-persons association simply represented a selection effect. Among men, there was no association between substance-free activity enjoyment and drinking across days. It is a particular challenge to engage young men in alcohol-free programming, given that they are less likely to report attendance at and enjoyment of these activities (Borsari et al. 2007;Murphy et al. 2006). Indeed, men may require different intervention and/or specific types of alcohol-free activities in order to be fully engaged (see Borsari and Carey 2006).

Research Questions

There is a need to evaluate the nature of the association between alcohol-free programming and substance use using more intensive data collection techniques, and to further explore the particular moderating role of gender (Murphy et al. 2007a). To the authors' knowledge, no previous study has used daily data to investigate the within-person associations between

campus-led alcohol-free programming and alcohol use. Focusing on the within-person association is especially valuable because doing so uses each respondent as his or her own control to assure that the relationship is not due to a between-persons selection process in which those who drink, or drink heavily, are less inclined to attend. In the current study, therefore, we examined links between daily web-based reports of activity involvement and alcohol use using multilevel models (MLM). We designed these models to separate estimates of between-persons relationships (i.e., whether the average alcohol use of people who attend LNPS differs from people who do not) from within-person relationships (i.e., whether alcohol use on weekend days attending LNPS differs from alcohol use on weekend days not attending LNPS, among the same individuals). In particular, our research questions were: (1) Within-person, compared to weekend days students go out for fun and entertainment, do students drink less on weekend days they attend LNPS and on days they stay in? and (2) Do these associations differ for men and women?

Method

Data from first-year college students at The Pennsylvania State University who were surveyed as part of the University Life Study (ULS) were used in the present analyses. The ULS utilized a longitudinal measurement burst design, with a baseline survey followed by 14 consecutive daily surveys each semester. The current analyses include data from Semester 1 (Fall 2007). A stratified random sampling procedure was used to achieve a diverse sample of first-year students with respect to gender and race/ethnicity. Eligible first-year students were U.S. citizens or permanent residents, under age 21, and residing within 25 miles of the main campus. Selected students were invited to complete a web-based baseline survey and 14 consecutive daily web surveys. The students were mailed an informational letter that included a description of the study, a pen, and a $5 cash incentive. Five days later, an email message was sent to each student with an active hyperlink to the web-based baseline survey. After students completed the baseline survey, an email message was sent the following morning containing an invitation to begin 14 consecutive short daily web surveys.

In total, 746 students (65.6% response rate) completed the baseline survey. The final sample was 25.2% Hispanic American, 27.4% European American Non-Hispanic (NH), 23.3% Asian American/Pacific Islander NH, 15.6% African American NH, and 8.5% Multiracial NH. Almost all (98.1%) lived in on-campus residence halls. Completion rates of the daily surveys were high, with most (86%) of the participants completing at least 12 of the 14 daily surveys, giving a total of 9,482 days of daily data in Semester 1. To restrict the present analyses to days when LNPS was an available option, we included only weekend days (Thursdays, Fridays, and Saturdays) and days when participants were present in the town of the university (N=3,350 days). LNPS activities were offered on each Thursday, Friday, and Saturday evening of the data collection period. Of the total 746 participants, data from 689 participants (51.4% women) were used in the analyses. These participants completed the baseline survey and provided data on at least one in-town weekend day in the daily survey.

Measures

Daily Activities—Each day, participants were asked, “From the time you woke up until you went to sleep, how much time did you spend doing the following activities?” with possible responses of *did not do* and *did do* for time ranges from *up to 30 min* to *10+ hours*. Daily activities were coded as one of three mutually-exclusive options. Regard-less of other activities reported, days when participants reported spending any time “Attending LateNight Penn State,” were coded as attending LNPS. On days when participants did not attend LNPS, they were coded as Going Out if they reported any time spent “Going to bars, parties,

etc.," "Attending sports, concert, movie, other entertainment," or "Attending another campus event or club." On days when participants did not attend LNPS and did not go out, there were coded as Staying In. Two dummy codes (LNPS and Staying In) were entered into the analyses, with Going Out as the reference category.

Daily quantity of alcohol use was assessed with the question, "How many drinks of alcohol did you drink?" Participants were previously instructed, for example, "This survey is about Friday [yesterday] from the time you woke up until you went to sleep." One drink was defined as, "half an ounce of absolute alcohol, for example 12 ounce can or bottle of beer or cooler, 5 ounce glass of wine, or a drink containing 1 shot of liquor or spirits" (NIAAA 2003). The number of standard drinks participants reported consuming each day was coded into three outcome variables for the present study. For each day, the total number of drinks was used (range=0 to 25 drinks), as well as whether participants reported any drinking or binge drinking (both no=0, yes=1). Binge drinking was defined as women consuming four or more drinks and men consuming five or more drinks (Wechsler et al. 1995).

Results

Descriptives

Twenty-four percent of the study participants (*n*=166; 27% of women, 21% of men) attended LNPS at least once during the 14 days of data collection. At the daily level, attendance at LNPS was reported on 8% (*n*=263), going out on 35%, and staying in on 57% of weekend days. The average number of drinks reported across weekend days was 1.43 (*SD*=3.15, range=0–25). On weekend days when students reported at least one drink, the average number of drinks consumed was 6.01 (*SD*=3.75). On weekend days not attending LNPS, 24.3% reported any drinking and 14.9% reported binge drinking. On weekend days attending LNPS, 11.4% reported any drinking and 4.6% reported binge drinking.

Multilevel Models Predicting Drinking Behavior

Three models, estimated with HLM 6.04 (Raudenbush and Bryk 2002), were used to predict total number of drinks, any drinking, and binge drinking. Due to skew in the total number of drinks variable, including a large number of zeroes, this outcome was modeled using a Poisson distribution (Snijders and Bosker 1999). For the two dichotomous outcomes of any drinking and binge drinking, the analysis used a logistic model based on the Bernoulli distribution (Raudenbush and Bryk 2002). In accord with our research questions, our primary Level 1 (within-person) predictors were the two dummy variables LNPS attendance (β_1) and Staying in (β_2). To limit the analysis to within-person relationships, both dummy variables were person-centered (i.e., expressed as deviations from individual means) and individuals' means across days for both dummy variables served as Level 2 predictors (γ_{02} and γ_{03}) of average alcohol use on weekend days (β_0) (Allison 2005; Bryk and Bryk 2002). Our models captured any differential effects for men and women by including gender as a Level 2 predictor of average alcohol use (γ_{01}) and of the effects of LNPS (γ_{11}) and Staying in (γ_{21}). In addition, day of week was controlled by adding two Level 1 dummy variables of Friday (γ_{30}) and Saturday (γ_{40}), with Thursday as the reference day. In all models, Fridays and Saturdays were associated with more drinking than Thursdays.

Total Number of Drinks—Results of the MLM with a Poisson distribution predicting total number of standard drinks are reported in Table 1. Our analyses include as control variables three Level 2, between-persons, predictors. First, men reported a greater number of drinks than did women (γ_{01}). Also, on average across all weekend days, people who attended LNPS more often (γ_{02}) and who stayed in more often (γ_{03}) reported drinking fewer drinks. Our primary focus is on the Level 1 measures, which reflect daily variation within-

person. Addressing research question 1, students drank 41% fewer drinks on days they attended LNPS (γ_{10}) and 74% fewer drinks on days they stayed in (γ_{20}), compared to days they went out (from models without gender interactions, not shown). Addressing research question 2, for both of these daily activity predictors, there was an interaction with gender (γ_{11}, γ_{21}) at a trend level of significance ($p<.10$). The shape of the interactions indicated that women reported a greater decrease in number of drinks on LNPS days and Staying in days than did men (see Fig. 1). The rate ratio for the intercept of LNPS (γ_{10}) refers to the effect for women (coded as 0). The rate ratio in Table 1 can be interpreted as a 64% decrease in number of drinks for females on days with LNPS attendance compared to days going out. For men, the rate ratio for women (γ_{10}) is multiplied by the gender interaction term (γ_{11}) [0.36×2.20=0.79], indicating a 21% decrease in number of drinks on LNPS days for men. On staying in days, women reported 79% fewer drinks and men reported 69% fewer drinks compared to days going out.

Any Drinking—Results for the model predicting whether any alcohol was consumed on a given day are also reported in Table 1. At Level 2, there was a trend-level effect of gender (γ_{01}) in the direction that men were more likely to drink. People who attended LNPS more often (γ_{02}) and stayed in more often (γ_{03}), on average, were less likely to drink in general across all weekend days. Addressing the first research question, at Level 1, on days students attended LNPS (β_1) and on days they stayed in (β_2) participants had 69% and 95% lower odds, respectively, of drinking than on days they went out. In addition, as with total drinks, gender moderated these associations such that women showed a greater decrease in likelihood to drink on days they attended LNPS (γ_{11}) or stayed in (γ_{21}), compared to men (see Fig. 2). For women, LNPS attendance was associated with 84% lower odds of consuming alcohol; for men, LNPS attendance was associated with 39% lower odds of drinking compared to days they went out. Staying in was associated with 96% lower odds of drinking for women and 92% lower odds of drinking for men, compared to days they went out.

Binge Drinking—MLM results predicting binge drinking are shown in Table 1. At Level 2, men were more likely to binge drink (γ_{01}), and people who attended LNPS (γ_{02})or stayed in (γ_{03}) more, on average across all weekend days, were less likely to binge drink. At Level 1, effects were also similar to those obtained for total drinks and any drinks, as reported above, with the exception that gender did not significantly moderate either of the Level 1 effects[1]. Students had 79% lower odds of binge drinking on LNPS days (γ_{10}) and 95% lower odds of binge drinking on staying in days (γ_{20}) compared to going out days.

Discussion

Alcohol use among college students is a consistent and prominent public health concern (Ham and Hope 2003; Hingson et al. 2005; Perkins 2002). In response, there has been a call to create substance-free activities for college students as a means of reducing alcohol-related problems on campuses nationwide (DeJong and Langford 2002; NIAAA 2002). However, there is very little empirical evaluation of such programs and whether they are actually associated with less drinking among students. Therefore, this study provides unique information regarding the dayto-day associations between program attendance and alcohol use. Attending alcohol-free programming was, in fact, associated with decreased drinking that day, especially among women. These effects were shown for all three outcome variables (total number of drinks, any drinking, and binge drinking) in analyses comparing individuals' drinking on days they attended LNPS or days they stayed in, to their drinking on

[1]Given that the gender interactions were not significant, the percentages given are from the model without the interaction term.

days they went to bars/parties, other campus events, or entertainment. Staying in, as opposed to going out for non-LNPS activities, was also associated with less drinking. For any drinking and number of drinks, these associations were stronger for women than men.

Theoretical Perspectives

Behavioral economic approaches highlight the possibility that decreases in substance use can be achieved by increasing the attractiveness of alternative or substance-free options (Murphy et al. 2007b). In addition, the routine activities perspective (Osgood et al. 1996, 2005) directs attention to the situations in which drinking occurs, which led us to consider what else students would be doing on evenings they did not attend LNPS. College drinking generally occurs in the context of active socializing with friends (e.g., O'Hare 1997). As an alcohol-free venue for such socializing, LNPS might be expected to reduce drinking compared to nights that students go out for fun and entertainment. LNPS is unlikely to reduce drinking compared to nights that students stay in, when drinking is less likely (e.g., Bachman et al. 2008). Our results strongly support this reasoning, suggesting that LNPS has considerable potential to reduce alcohol use when it serves as an alternative to the other venues in which Penn State students typically spend their nights out. Yet we also find that, if LNPS instead primarily drew students who would otherwise have stayed in, it might not have this benefit. Thus, for the purposes of reducing alcohol use among drinkers, it is important that programs such as LNPS target students who would otherwise be out and about on a given evening, even more than they are targeted at students who would otherwise stay in that night. It is important to note, however, that alcohol-free programs may serve additional valued purposes such as enhancing the college experience, improving retention, and preventing the onset of drinking among abstainers or light drinkers. In the context of the Theory of Triadic Influence (Flay and Petraitis 1994), for example, LNPS may be expected to change the socio-cultural environment for students on campus by demonstrating that the university values alcohol-free activities and limiting access to alcohol during events. In addition, students who attend are exposed to peers who are more likely to value alcohol-free entertainment, which may affect their normative beliefs about drinking on campus (Petratis et al. 1995). Empirical support for these proposed mechanisms of change is beyond the scope of this study, but should be explored in future work.

Strengths, Limitations, and Future Directions

This evaluation of the LNPS program has considerable strengths, including using a stratified random sample of students in their first year of college who were not selected based on program attendance and obtaining high response and participation rates. An obvious design limitation is that students could not be randomly assigned to participate in the program in order to eliminate the possibility of selection effects. Although the design does not account for individuals' selection into locations, the impact of such selection effects was reduced by using a nested design to assess within-person effects of attending LNPS, compared to days not attending, for the same individuals and thus controlling for stable individual differences. To the authors' knowledge, this is the first evaluation of an alcohol-free social program to use this strategy. Limitations included having only 14 daily reports from each student, thus capturing only six weekend (Thursday, Friday, or Saturday) days. In addition, both attendance and drinking were self-reported. Though the current design provides support for claims that LNPS decreases drinking, the limitations of our correlational research design must be recognized. On days students attended LNPS they drank less than on days they went out, and these differences cannot be due to stable individual differences. However, daily reports of intentions to drink are not available. It is possible that on days students did not intend to drink they were more likely to choose to go to LNPS. While this would represent a within-person selection effect, it nonetheless could be considered a success of the program in that non-drinking activity choices were available. A definitive assessment of the causal

impact of alcohol-free programming on college campuses would require a randomized experiment. Finally, readers should keep in mind that the counterfactual to LNPS in our analyses is days students went out for the evening. Future research should explore what types of students are drawn to LNPS programming to rule out the possibility that alcohol-free programs have iatrogenic effects for alcohol use among students who would otherwise stay in for the evening.

Our results provide encouraging support that LNPS may be an effective strategy for decreasing alcohol use on days when students attend alcohol-free events rather than going to other events or gatherings. Consistent with the NIAAA Task Force's(2002) call for more research on and funding for alcohol-free programming, this study supports the importance of a campus-based strategy providing alternative entertainment options as one element of a comprehensive program to decrease alcohol use and its related negative consequences for individuals and the campus community. Future research should include an assessment of the amount of time spent at alcohol-free programming and the potential role of the social context of the weekend evening. The lesser effect of LNPS in decreasing men's drinking is an important challenge for programmers that must first be better understood before the attractiveness of substance-free options can be improved. In addition, the current study examined a single example of a model alcohol-free program. The characteristics of specific alcohol-free programs that make them most effective need to be determined based on future empirical work comparing multiple programs across campuses.

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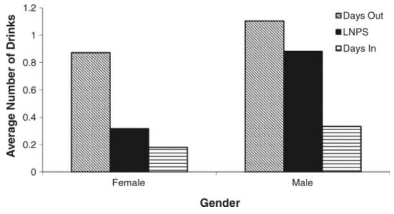

Fig. 1.
Gender moderates the association between LNPS attendance and number of drinks consumed on weekend days

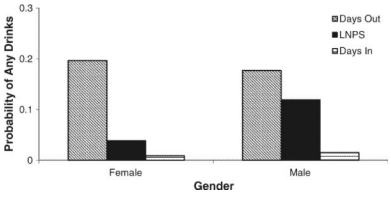

Fig. 2.
Gender moderates the association between LNPS attendance and likelihood of drinking on weekend days

Table 1

Multilevel modeling predicting drinking behavior by gender, LateNight Penn State attendance, and Staying In

	Total drinks Rate ratio [CI]	Any drinks Odds ratio [CI]	Binge drinking Odds ratio [CI]
Average drinking on weekend days, β_0			
Intercept, γ_{00}	0.25 [.20, .31]****	0.04 [.03, .05]****	0.02 [.01, .02]****
Male gender, γ_{01}	1.67 [1.27, 2.21]****	1.43 [.95, 2.15]*	1.72 [1.08, 2.77]**
Mean LNPS Attendance, γ_{02}	0.01 [.00, .04]****	0.001 [.00, .003]****	0.001 [.00, .01]****
Mean Staying In, γ_{03}	0.04 [.02, .06]****	0.01 [.00, .01]****	0.01 [.00, .01]****
Average fluctuations with LNPS attendance, β_1			
Intercept, γ_{10}	0.36 [.20, .66]***	0.16 [.06, .43]***	0.15 [.05, .47]***
Gender, γ_{11}	2.20 [0.94, 5.14]*	3.82 [.95, 15.35]*	1.86 [.38, 9.08]
Average fluctuations with Staying In, β_2			
Intercept, γ_{20}	0.21 [.16, .27]****	0.04 [.02, .06]****	0.05 [.03, .08]****
Gender, γ_{21}	1.46 [.97, 2.20]*	1.96 [1.03, 3.71]**	1.44 [.64, 3.26]
Average fluctuations on Fridays, β_3			
Intercept, γ_{30}	1.69 [1.42, 2.01]****	4.33 [3.05, 6.15]****	3.06 [2.11, 4.43]****
Average fluctuations on Saturdays, β_4			
Intercept, γ_{40}	1.34 [1.15, 1.56]****	2.11 [1.51, 2.94]****	1.57 [1.08, 2.29]**

* $p<.10$

** $p<.05$

*** $p<.01$

**** $p<.001$