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Interactions Between Drinking Motives and Friends in Predicting Young Adults' Alcohol Use

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Abstract

While drinking motives are well-established proximal predictors of alcohol use, less is known about their role in event-level drinking behavior. The present study examines whether the interaction between individuals' drinking motives and the number of friends present at a given moment can predict alcohol consumption over the course of the evening. Using the Internet-based cell phone-optimized assessment technique (ICAT), 183 young adults (53.0 % female, mean age =23.1) in French-speaking Switzerland completed cell phone questionnaires every Thursday, Friday, and Saturday evening over five weekends. A total of 7205 questionnaires completed on 1441 evenings were analyzed. Drinking motives and gender were assessed at baseline, while the hourly alcohol consumption rate and number of friends present were assessed at 8 p.m., 9 p.m., 10 p.m., 11 p.m., and midnight. Multilevel growth curve models with time-invariant and time-varying covariates were estimated for men and women separately. Among women, enhancement motives were associated with an increase in the hourly alcohol consumption rate over the course of the evening (b=.025; p <.05). The impact of the number of friends present on the hourly consumption rate was stronger among those women who scored high on coping motives at baseline (b=.028; p< .05). Among men, drinking motives were found to have no moderating effects. Results highlight the role of drinking motives and their interactions with situational characteristics in determining event-level drinking, especially among women. Strategies to prevent risky weekend drinking should focus on both the social environment in which drinking takes place (e.g., the drinking group) and individual drinking motives.

Keywords

Alcohol use; Young adults; Drinking motives; Internet-based cell phone-optimized assessment technique (ICAT); Multilevel growth curve analysis

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Ethical Approval All procedures involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and the 1964 Declaration of Helsinki and its later amendments or comparable ethical standards. Study procedures were approved by the Ethics Committee of Lausanne University (Canton de Vaud Protocol No. 223/08) and the data were collected between April and July 2010.

Conflict of interest The authors declare that they have no conflicts of interest.

Introduction

Excessive drinking among young people primarily occurs on Friday and Saturday nights (Kuntsche and Gmel 2013) and is associated with a significant risk of adverse psychological, social, and physical health consequences, including injuries, unplanned sex, and academic failure (Jennison 2004; Wechsler et al. 1994). Previous studies have found that young adults' drinking behavior over the course of weekend evenings differs by day and between men and women (Kuntsche and Labhart 2012), and compared to a stable low drinking trajectory, accelerated drinking on Saturday evenings was associated with an eightfold increase in overall consumption and a 17-fold increase in alcohol-related adverse consequences (Kuntsche et al. 2015). Despite the prevalence of heavy weekend drinking, evidence is scarce on what happens during these drinking events and which factors predict the amount of alcohol consumed. This study examined the effect of individual drinking motives on young adults' drinking behavior, as well as interactions between these drinking motives, drinking group size, and young adults' event-level alcohol consumption.

Drinking Motives as Predictors of Event-Level Alcohol Consumption

Drinking motives are among the most important proximal predictors of drinking behavior (Cooper 1994; Cox and Klinger 1988) and serve as the gateway through which more distal factors such as alcohol expectancies (Kuntsche et al. 2010), genetic factors (Hendershot et al. 2011; Kristjansson et al. 2012), and personality characteristics (Ham and Hope 2003; Tragesser et al. 2007) are mediated. Drinking motives can be classified by the kind of reinforcement individuals seek to obtain (positive vs. negative) in relation to either the psychoactive effects of alcohol (internal) or instrumental, social effects (external). This results in four categories (Cooper 1994): enhancement (internal and positive, e.g., drinking to have fun), coping (internal and negative, e.g., drinking to forget problems), social (external and positive, e.g., drinking to be sociable), and conformity (external and negative, e.g., drinking to fit in with a group). Previous research based on retrospective self-report measures has suggested that social motives are related to frequent drinking, whereas enhancement and coping motives are related to heavy episodic drinking (Kuntsche et al. 2005; Kuntsche and Kuntsche 2009). Lastly, drinking in order to cope with problems has been found to be a predictor of negative alcohol-related consequences among college students (Neighbors et al. 2007).

Only a few studies have examined the role of drinking motives in event-level drinking behavior. Enhancement motives were found to predict weekend drinking over and above usual consumption in a study using daily assessments (Kuntsche and Cooper 2010) and were also associated with greater alcohol consumption in experimental taste-rating sessions (Kuntsche and Kuendig 2012). Another study found that enhancement motives predicted heavy drinking and its related consequences (e.g., hangover, injuries, blackouts, etc.) on a given evening among men, while coping motives were a predictor of heavy drinking among women (Kuntsche and Labhart 2013a). Coping motives also predicted the frequency of pre-drinking (i.e., drinking before going out to licensed premises) among women. Together, these findings suggest that drinking motives not only affect usual drinking behavior but also predict event-level alcohol use.

Presence of Friends as a Predictor

Although drinking motives are important predictors of drinking behavior, individuals rarely act independently of their social environment. Peer influences have long been recognized as one of the key factors which shape substance use behavior among young people (Hawkins et al. 1992). The drinking group exerts a significant influence on the drinking behavior of young adults, and this has been found in survey research (Kairouz et al. 2002; Senchak et al. 1998), in controlled environments such as bar laboratories and taste-rating studies (Bot et al. 2007; Kuendig and Kuntsche 2012; Larsen et al. 2009), and in observational studies carried out in the participants' natural environment (Aitken and Jahoda 1983; Geller et al. 1986; Rosenbluth et al. 1978). Compared to survey research, the latter three have the advantage that they assess drinking behavior closer to the actual event and thus avoid recall bias (Ekholm 2004; Gmel and Rehm 2004). However, the ecological validity of a bar laboratory is still limited and observational studies conducted at bars or parties may disrupt the natural environment. Furthermore, these designs generally only allow for the collection of data at one specific point in time and do not capture the dynamic drinking trajectories over the course of the evening (Clapp et al. 2008).

With regard to drinking group size, the mere presence of others may impact an individual's drinking behavior. Previous survey research suggests that larger drinking groups instigate alcohol consumption (Kairouz et al. 2002; Senchak et al. 1998), and several observational studies investigating in situ alcohol use reported that individuals drink more in a group setting than when drinking alone (Geller et al. 1986) or in a dyad (Rosenbluth et al. 1978). Using event-level data collected in the natural environment, a previous study found that the higher the number of friends present, the greater the number of drinks consumed in hourly intervals over the course of the evening (Thrul and Kuntsche 2015). While this effect was observed for both men and women, our findings also indicated that the presence of friends had a stronger effect for men than for women. However, interactions between individual differences in drinking motives and the impact of friends have yet to be studied.

Interactions Between Drinking Motives and the Drinking Group

Drinking motives may moderate the impact that the drinking group has on drinking behavior. For example, some young people may consume more alcohol when their friends are present due to their personal drinking motives. Kairouz et al. (2002) sampled drinking occasions through a retrospective survey among college students and found that various reasons for drinking, such as to be sociable, to conform with others, to feel good, or to forget worries (all compared to drinking to enjoy the taste or to enhance a meal) increased alcohol use, as did a larger drinking group size. Another study found that college students scoring high on the agreeableness personality trait adapted their drinking behavior more easily to a high- or low-drinking peer group in a bar-laboratory setting than those who scored low on agreeableness (van Schoor et al. 2008). In another study of drinking among college students, the time spent with friends was positively associated with alcohol use, as reported in daily assessments (Mohr et al. 2005), while enhancement motives moderated this association. Among individuals who scored high on enhancement motives, more time spent with friends was positively associated with drinking at home and negatively associated with drinking

away from home. However, no such association was found among participants who scored low on these motives.

In summary, few previous studies have reported interactions between drinking motives and characteristics of the drinking situation, such as peer-group drinking or time with friends, and the associated effects on alcohol consumption.

Study Aims

This study used an experience-sampling procedure to assess the effect of individual drinking motives on the hourly alcohol consumption rate, as well as the interactions between these drinking motives and the situational impact of the number of friends present on the hourly consumption rate of young adults over the course of an evening. Building on the results of a previous study, which found a positive association between the number of friends present at a given moment and the hourly alcohol consumption rate among young adults (Thrul and Kuntsche 2015), the aim of the present study was to examine whether individual drinking motives moderated this association. We thus tested whether the drinking behavior of young adults scoring high on certain drinking motives (e.g., drinking to have fun or be sociable) would be particularly affected by the number of friends present.

Methods

Study Design and Participants

The Internet-based cell phone-optimized assessment technique (ICAT) (Kuntsche and Labhart 2013b) consists of a baseline Internet questionnaire completed after online registration and a series of online questionnaires to be completed on participants' personal cell phones. Students from three higher education institutions in French-speaking Switzerland, the Lausanne Hotel School (1200 students), the Apprenticeship School in Lausanne (500 students), and the University of Applied Sciences in Geneva (3500 students) received an email invitation directing them to the study's registration webpage where they found information on the aims and incentives of the study (randomly-drawn vouchers worth USD 40 to 80). Every Thursday, Friday, and Saturday evening for 5 weeks, participants were sent six text messages (at 8 p.m., 9 p.m., 10 p.m., 11 p.m., midnight, and the next morning at 11 a.m.) containing a hyperlink to complete a questionnaire in their cell phone browser.

A total of 276 participants registered during the 1-week recruitment period. We excluded participants who did not complete any cell phone assessment (n = 24, 8.7 %) and those who reported no alcohol use during the entire study (n =16, 5.8 %). We also excluded any evenings where more than two assessments were missing. As a result, 53 (19.2 %) additional participants were excluded because they had missing data on every evening. The resulting analytical sample comprised 183 participants (97 women, 53.0 %; mean age = 23.1, SD = 3.1, range 17–37), who submitted 7828 assessments over 1441 evenings. Excluded participants were younger (M = 22.1, SD = 3.3, t = −2.29, p < .05) than those in the final sample, and there were no gender differences between the groups.

Assessments were completed on an average of 3.8 weekends (SD = 1.4) and 7.9 days (SD = 4.0), which corresponds to an average participation rate of 76.0 % for all sampled weekends and a participation rate of 52.7 % for all sampled days. For evenings with remaining missing assessments (n = 818), data were imputed by means of chained equations using the Stata ICE procedure (Royston 2005). More information on this study design and sample is provided elsewhere (Kuntsche and Labhart 2012, 2013a; Labhart et al. 2013). Since the question on the number of friends present was not included in the questionnaire sent at 11 a.m. the following day (Labhart et al. 2014), our analyses are based on the five assessments until midnight. This represents 6650 submitted and 555 imputed assessments (7205 in total; 39.4 assessments per participant).

Measures

In the Baseline Questionnaire (Individual Level)—Participants were asked to indicate their age and gender.

Drinking motives were assessed using the 20-item Drinking Motives Questionnaire-Revised (Cooper 1994), which measures drinking for social (e.g., “Because it helps you enjoy a party”), enhancement (e.g., “Because you like the feeling”), coping (e.g., “Because you feel more confident and sure of yourself’), and conformity motives (e.g., “To fit in with a group you like”) in the last 12 months. Answer categories ranged from “never/almost never” (coded as 1) to “almost always” (coded as 5). For each dimension, a mean score of the five items was calculated (Cronbach’s α_{social}=.80, $\alpha_{enhancement}$=.72, α_{coping}=.73, $\alpha_{conformity}$ = . 55).

Cell Phone Questionnaires (Event Level)—To assess the *hourly alcohol consumption rate*, participants were asked “How many of the following alcoholic drinks did you have between…?” with the time frames of the five assessments being “5–8 p.m.,” “8–9 p.m.,” “9–10 p.m.,” “10–11 p.m.,” and “11 p.m.–midnight.” Separate questions allowed participants to indicate how many drinks of “beer,” “wine or champagne,” “aperitifs (e.g., port) or liqueur,” “(straight) spirits,” “self-mixed drinks (e.g., whisky and coke) or cocktails,” and “alcopops” they had consumed in the given time frame. The six answer categories ranged from “0” to “five or more” (coded as 5.5). Due to the extended time period of the first assessment (i.e., 5–8 p.m.) and because consumption was assumed to increase during this interval, two-thirds of the indicated consumption was taken to approximate consumption prior to 8 p.m. (Kuntsche and Labhart 2012, 2013a).

To assess the *number of friends present*, participants were asked “How many people were you with between…?” The time frames were the same as those used in the previous question (see above). Two questions asked participants to indicate how many male and female friends (including romantic partners) were present in the given time frame. The five answer categories ranged from “0” to “more than 20” (coded as 23.5). For each time frame, the number of male and female friends was added together to create a measure of the total number of friends present.

Analytical Strategy

We estimated a three-level growth curve model (hourly assessments, clustered within evenings, and clustered within individuals) with time-invariant (assessed at the individual level and thus constant over time, e.g., drinking motives) and time-varying covariates (assessed at the event level and thus changing over time, e.g., number of friends present every hour). The outcome used was the "hourly alcohol consumption rate," i.e., the number of drinks per time interval (hour), over the course of the evening. The model contained predictors on all three levels (drinking motives at the individual level, weekend day at the evening level, and number of friends present at a given hour at the event level). Given that previous studies have shown that drinking trajectories differ across weekend days (Kuntsche and Labhart 2012; Thrul and Kuntsche 2015), dummy variables for Thursday and Friday were included on the evening level (making Saturday the evening-level reference). Intraclass correlations (ICCs) for the hourly alcohol consumption rate at the different levels were $ICC_{school} = 0.01$, $ICC_{individual} = 0.16$, $ICC_{week} = 0.02$, and $ICC_{evening} = 0.04$. We have therefore omitted school and week as additional levels in the model. As the outcome variable "hourly alcohol consumption rate" was positively skewed and nonnormally distributed, all models were estimated using maximum likelihood estimation with robust standard errors (MLR). The software Mplus 7 (Muthén and Muthén 2015) was used for all analyses.

To test the effects of drinking motives and the number of friends present on the hourly alcohol consumption rate, we estimated a main effect model without the cross-level interaction effect between drinking motives and the number of friends present. The final interaction model, shown in Fig. 1, then tested whether individual drinking motives moderate the impact of the number of friends present on the hourly alcohol consumption rate reported by participants over the course of the evening. Specifically, we tested whether this effect would differ depending on how the participant scored on a given drinking motive. This was done by including cross-level interaction effects between the four different drinking motives and the number of friends present at a given hour as a time-varying covariate in predicting the hourly alcohol consumption rate. Both the main and interaction models were estimated separately for men and women, since we previously found that the effect of friends on drinking behavior was stronger among men (Thrul and Kuntsche 2015) and because drinking motives are known to differ between men and women (Cooper 1994; Kuntsche et al. 2006). We tested a curvilinear relationship between predictor variables and the hourly alcohol consumption rate by including a quadratic term as part of the growth curve. This quadratic term was nonsignificant (results not shown).

Results

Descriptive Results

A visual inspection of the data showed that the percentage of participants reporting any alcohol use in the past hour at the respective hourly assessment tended to decrease over the course of Thursday evenings among men and women alike (Table 1). On Fridays, it remained relatively stable for men but peaked at 9–10 p.m. for women. For women, this same pattern was also observed on Saturdays but with higher percentage of women who reported drinking throughout the night. There was an increase in the percentage of men who

drank on Saturday from before 8 to 10–11 p.m., when it peaked. The average hourly alcohol consumption rate among participants reporting any alcohol use ranged from 1.7 to 2.5 for men and from 1.6 to 2.2 for women. For men and women, the average number of friends present every hour tended to decrease on Thursdays, remained relatively stable on Fridays, and increased from before 8 to 10–11 p.m. on Saturdays, when it peaked. The average number of friends present at each hour ranged from 1.9 to 6.4 for men and from 1.8 to 5.7 for women.

The description for drinking motives at the individual level is given in Table 2. The highest scores were reported for social motives, followed by enhancement, coping, and conformity motives, in that order (repeated measures ANOVA: $F(3, 546)=288.7$; $p<.001$; all pairwise comparisons significant). Men reported significantly higher social motives than women ($t = -4.0$; $p < .001$), and no significant differences between men and women were observed for other motives.

Multilevel Growth Curve Models

Main Effect Model—Women started their drinking with a significantly lower hourly alcohol consumption rate on Thursdays than on Saturdays (indicated by the significant drinking intercept, main effect, and interaction model in Table 3). Furthermore, we also found among women that there was a positive association between enhancement motives and the drinking slope (i.e., increase in the hourly alcohol consumption rate) over the course of the evening. Men had a shallower drinking slope (i.e., a slower increase in the hourly alcohol consumption rate) on Thursdays and Fridays than on Saturdays (indicated by the negative drinking slopes). We found no significant associations between drinking motives and the hourly alcohol consumption rate among men. The number of friends was significantly and positively associated with the hourly alcohol consumption rate of women and men alike.

Interaction model—The higher women scored on coping motives, the stronger the impact of the number of friends on their hourly alcohol consumption rate. Individual drinking motives did not moderate the impact which the number of friends present had on the hourly alcohol consumption rate among men.

Discussion

The main objective of this study was to investigate the effect of drinking motives on the hourly rate of alcohol consumption and to test whether drinking motives moderate the impact that the number of friends present have on the hourly alcohol consumption rate among young adults, based on event-level data over the course of the evening.

Our study found that for women, enhancement motives were positively associated with an increase in the hourly alcohol consumption rate. That is, the higher women scored on enhancement motives at baseline, the greater the increase in their hourly alcohol consumption rate over the course of the evening. This was the case after adjusting for the weekend day, other drinking motives, and the situational impact of the number of friends present. These results are consistent with previous studies which showed that enhancement

motives predict alcohol use in young people over time (Cooper et al. 2008; Read et al. 2003). Furthermore, enhancement motives were associated with alcohol use when assessed in daily measurements (Kuntsche and Cooper 2010; Mohr et al. 2005) and based on observational in situ data (Kuntsche and Kuendig 2012). Yet, in contrast to our findings, a previous study reported that, based on event-level data, coping motives, not enhancement motives, predicted heavy drinking among women (Kuntsche and Labhart 2013a). However, it should be noted that this previous study investigated a different outcome, controlled for pre-drinking on any given evening, and did not account for drinking group size as a situational predictor of alcohol consumption. The negative intercept for enhancement among women suggests that women who endorse this drinking motive more strongly may start with a lower alcohol consumption rate per hour but show a stronger increase in their hourly consumption rate over the course of the evening (as suggested by the positive slope). The present study extends previous findings by showing that women who drink to have fun seem to increase their hourly alcohol consumption rate over and above the impact of the drinking group size.

Regarding the cross-level interactions between drinking motives and the number of friends present, we found that coping motives moderated the impact of the number of friends present on the hourly alcohol consumption rate, as this association was stronger for women who scored high on coping motives. One explanation may be that in situations where many friends are present (including potential romantic partners), young adult women who score high on coping motives use alcohol as a means to overcome nervousness, insecurity, and self-consciousness in social situations. This interpretation is consistent with several studies suggesting that social concerns, anxiety sensitivity, and coping motives are important factors in predicting alcohol use among women (Reyno et al. 2006; Stewart et al. 1995; Stewart et al. 2001). As has been argued previously, adolescent women may use alcohol as a means to ease anxiety (Kuntsche et al. 2006). The results of the present study extend the literature on the role of coping motives in alcohol use among women, since our findings are based on event-level drinking reports. However, further research is needed to examine interactions between coping motives, the characteristics of drinking contexts, and the drinking behavior of young women at event level.

Drinking motives did not predict the drinking behavior of men across the evening and did not moderate the association between the number of friends present and the hourly rate of alcohol consumption. These results are inconsistent with a previous study which found that enhancement motives predicted episodic heavy drinking among young men (Kuntsche and Labhart 2013a). Again, this previous study investigated a different alcohol outcome, controlled for pre-drinking, and did not account for drinking group size as a situational predictor of alcohol consumption. Overall, the current study found that drinking motives had no significant effect on drinking behavior of men at event level. Several previous studies assessed the influence of others on young people's drinking behavior and reported that the drinking behavior of others generally has a stronger effect on men's drinking behavior than on female alcohol use (Bot et al. 2007; Kairouz et al. 2002; Koordeman et al. 2011). Our findings are consistent with the notion that external factors (i.e., situational and social aspects) are stronger drinking trigger for men than for women. In addition to these external factors, drinking behavior of young women also depends on internal characteristics, such as

individual drinking motives or personality traits (Holmila and Raitasalo 2005). Our findings may signify that the more friends are present on weekend evenings, the heavier men drink, regardless of their personal motives for alcohol use. The impact of the drinking group may therefore be more important in shaping young men's drinking behavior than differences in internal factors.

Limitations and Strengths

When interpreting the results, several limitations should be kept in mind. Firstly, the findings are based on a relatively small sample of college students from two cities in Switzerland and participants self-selected to participate in the study. Consequently, the results may not apply to representative community samples or other cultural contexts, and analyses may not have been adequately powered to detect significant effects. Power and increasing model complexity may be especially problematic when testing higher order interaction terms (e.g., three-way cross-level interactions: gender by motive by drinking group size) to investigate differences between men and women. When we investigated these higher order interactions, no significant differences between genders emerged (results not shown). Here, we report separate models for men and women and future studies are needed to investigate gender differences. Secondly, this study only assessed the number of friends present and not their drinking behavior, which may have a separate impact. For example, participants reporting high conformity motives may be more affected by their friends' drinking behavior than participants with low conformity motives. Further, we did not control for drinking venue and gender ratio among friends present. No information about the group composition with regard to friendship type (e.g., level of intimacy or strength of friendship bond) was available, which may vary according to the type of event and setting (e.g., closer friends at home, acquaintances at a club). Lastly, since we assessed the drinking group size over a short retrospective time interval (mostly 1 h), we do not know how changes in the drinking group within these assessment windows may have affected our results. The main strength of our study is the unique design used to assess alcohol consumption and the number of friends present in hourly intervals over the course of the evening. By collecting event-level data in the participants' natural drinking environment, this study minimized recall bias while maximizing ecological validity (Shiffman et al. 2008). As this study is the first to examine the moderating effect of drinking motives on the association between characteristics of the drinking group and event-level drinking behavior, future studies in other countries and drinking cultures using event-level drinking in the natural environment are needed to examine the replicability of the current findings. Lastly, our study examined trait aspects of drinking motives (Cooper 1994), but recent studies suggest that drinking motives may vary from day to day (Arbeau et al. 2011; O'Hara et al. 2015) or between weekdays and weekends (Studer et al. 2014). Thus, future studies should investigate the interplay between daily variation in drinking motives and the drinking group, and their joint effects on event-level drinking behavior.

Conclusions

After accounting for other drinking motives and the situational context, we found that the increase in the hourly alcohol consumption rate over the course of the evening was greatest

among women who scored high on enhancement motives. When more friends were present, women with stronger coping motives consumed more drinks per hour, even when the latent growth model accounted for their drinking behavior over the course of the evening. Among men, no associations were observed between drinking motives and the hourly alcohol consumption rate, nor did we find any interactions between drinking motives and the impact of the number of friends on the hourly consumption rate.

Our results indicate that a combination of strategies is needed to prevent risky drinking among young adults on weekend evenings. As the drinking group impacts the quantities of alcohol consumed by women and men alike, one aspect of these prevention strategies should focus on changing the drinking environment to reduce risky drinking among all young adults independent of their drinking motives. Multicomponent measures such as community mobilization, server training, and enforcement of licensing are effective ways of curbing risky drinking and the negative consequences associated with it (Bolier et al. 2011; Jones et al. 2011). However, based on our results, we also recommend interventions focused on individual drinking motives. For example, prevention measures for women could target enhancement and coping motives and motivate young adult women to use strategies other than alcohol consumption as a way of coping with stress and anxiety in social situations. In colleges, interventions providing individualized feedback on alcohol expectancies or drinking motives have proven successful in reducing alcohol consumption (Carey et al. 2007). Other promising approaches include personality-targeted interventions (Conrod et al. 2011; Conrod et al. 2006) and motivational enhancement group interventions (LaBrie et al. 2008) to reduce drinking and alcohol-related consequences.

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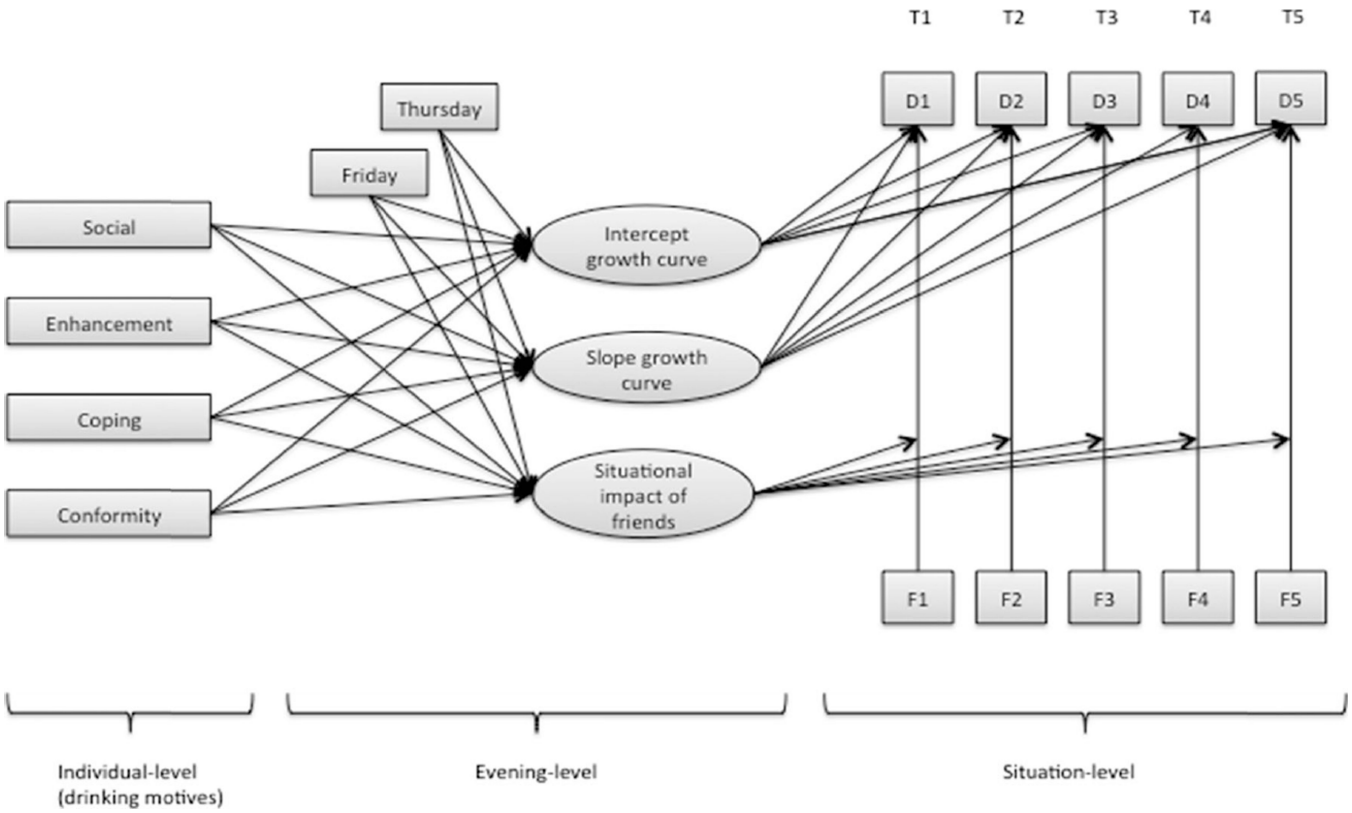

Fig. 1.

Multilevel growth curve model with time-invariant and time-varying covariates, including drinking motives as individual-level factors and the cross-level interaction effect between individual drinking motives and the impact of friends (interaction model). *T1–T5* time points 1 to 5 (8 p.m. to 12 a.m.), *D1–D5* hourly alcohol consumption rate at every time point, F1–F5 number of friends present at every time point, Saturday was used as reference category on the evening level. The latent variable "Situational impact of friends" represents the random slope for the outcome "hourly alcohol consumption rate" which is regressed on the "number of friends" at every time points 1–5. The *arrows* from each of the drinking motives to the latent variable "Situational impact of friends" represent the cross-level interaction to test if the effect of "number of friends" on "hourly alcohol consumption rate" varies by participants' scores on the different drinking motives

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Table 1

Sample description evening level—percentage of drinkers, average hourly alcohol consumption rate among drinkers, and number of friends according to gender, day of the week and time period in the evening (N = 1441 evenings)

	Before 8 p.m.	8–9 p.m.	9–10 p.m.	10–11 p.m.	11 p.m.–midnight
Men					
Thursday					
Percentage of drinkers[a]	31.3	28.0	27.6	21.4	16.0
Consumption rate[b] (SD)	2.4 (1.7)	1.8 (1.1)	1.7 (1.0)	2.1 (1.5)	2.0 (1.6)
Number of friends (SD)	3.6 (7.6)	2.5 (5.8)	2.4 (5.1)	2.5 (5.8)	1.9 (4.7)
Friday					
Percentage of drinkers[a]	34.8	35.4	34.8	32.6	33.7
Consumption rate[b] (SD)	2.1 (1.3)	2.1 (1.0)	2.0 (1.1)	2.4 (1.9)	2.2 (1.2)
Number of friends (SD)	3.1 (6.1)	2.9 (5.0)	3.1 (5.7)	3.4 (5.9)	3.4 (5.8)
Saturday					
Percentage of drinkers[a]	35.0	36.7	46.0	46.5	40.7
Consumption rate[b] (SD)	2.4 (2.0)	2.3 (1.6)	2.1 (1.2)	2.3 (1.5)	2.5 (1.7)
Number of friends (SD)	3.4 (6.8)	4.7 (9.5)	5.3 (10.0)	6.4 (10.7)	4.9 (9.1)
Wo men					
Thursday					
Percentage of drinkers[a]	22.6	22.3	21.9	18.0	15.2
Consumption rate[b] (SD)	2.2 (3.2)	1.8 (1.7)	1.6 (0.9)	1.8 (1.1)	1.8 (1.0)
Number of friends (SD)	3.7 (7.9)	2.5 (5.5)	2.6 (6.4)	2.4 (5.8)	1.8 (4.6)
Friday					
Percentage of drinkers[a]	20.5	26.8	30.5	25.0	18.6
Consumption rate[b] (SD)	2.1 (1.2)	1.7 (1.2)	1.7 (1.2)	1.6 (1.0)	1.6 (1.2)
Number of friends (SD)	2.7 (6.0)	2.2 (4.5)	2.4 (5.0)	2.6 (5.2)	2.2 (5.1)
Saturday					
Percentage of drinkers[a]	39.0	47.8	47.4	41.2	38.6
Consumption rate[b] (SD)	2.0 (1.4)	1.7 (1.0)	1.7 (1.0)	1.9 (1.3)	1.9 (1.3)

	Before 8 p.m.	8–9 p.m.	9–10 p.m.	10–11 p.m.	11 p.m.–midnight
Number of friends (SD)	3.8 (7.9)	4.9 (10.0)	5.0 (9.7)	5.7 (10.8)	4.7 (9.2)

[a] Percentage of participants reporting any alcohol use in the past hour at the respective hourly assessment

[b] Average hourly number of drinks among drinkers

Table 2

Sample description individual level

	Total		Men		Women		
	N (%)/M (SD)	**Range**	**N (%)/M (SD)**	**Range**	**N (%)/M (SD)**	**Range**	***t*-values**
	183 (100.0)	-	86 (47.0)	-	97 (53.0)	-	
Social motives	2.7 (0.9)	1–5	2.9 (0.9)	1–5	2.4 (0.8)	1–5	4.0***
Enhancement motives	2.1 (0.8)	1–5	2.2 (0.8)	1–4	2.0 (0.8)	1–5	1.6
Coping motives	1.5 (0.6)	1–4.6	1.5 (0.6)	1–3.8	1.5 (0.6)	1–4.6	0.5
Conformity motives	1.2 (0.3)	1–2.2	1.2 (0.3)	1–2.2	1.2 (0.2)	1–2.2	0.5

*** p<.001

Table 3

Multilevel growth curve models predicting hourly alcohol consumption rate, with drinking motives as predictors on the individual level, according to gender

	Women			Men		
Predictor	**Alcohol consumption rate intercept**	**Alcohol consumption rate slope**	**Impact of friends**	**Alcohol consumption rate intercept**	**Alcohol consumption rate slope**	**Impact of friends**
Main effect model						
Evening level (ref: Saturday)						
Friday	−.055 (.049)	−.004 (.021)	.004 (.016)	.050 (.107)	−.061 * (.031)	−.022 (.021)
Thursday	−.117 * (.046)	−.015 (.019)	.000 (.013)	−.026 (.072)	−.125 *** (.026)	−.022 (.016)
Individual level			.063 *** (.010)			.104 *** (.024)
Social	−.007 (.050)	.004 (.013)	–	.061 (.066)	.012 (.023)	–
Enhancement	−.070 (.041)	.025 * (.013)	–	.035 (.075)	.003 (.028)	–
Coping	.109 (.058)	.016 (.018)	–	−.210 (.139)	.050 (.066)	–
Conformity	.018 (.159)	−.026 (.038)	–	.541 (.379)	−.108 (.113)	–
Interaction model						
Evening level (ref: Saturday)						
Friday	−.060 (.049)	−.004 (.021)	.008 (.016)	.059 (.107)	−.062 * (.030)	−.027 (.021)
Thursday	−.119 * (.046)	−.015 (.019)	.001 (.013)	−.020 (.072)	−.127 *** (.025)	−.026 (.016)
Individual level						
Social	.002 (.053)	.003 (.013)	−.013 (.012)	.054 (.067)	.011 (.023)	.011 (.021)
Enhancement	−.070 (.046)	.026 * (.013)	.006 (.013)	.024 (.074)	.004 (.027)	.015 (.026)
Coping	.090 (.059)	.018 (.018)	.028 * (.012)	−.245 (.144)	.051 (.062)	.035 (.062)
Conformity	.019 (.174)	−.024 (.037)	−.001 (.041)	.612 (.390)	−.111 (.113)	−.075 (.058)

Figures shown are unstandardized regression coefficients (standard errors in brackets)

* $p < .05$

** $p < .01$

*** $p < .001$