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Testing Daily-Level Drinking and Negative Consequences as Predictors of Next-Day Drinking Cognitions

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Abstract

Objective: Limited research has examined how alcohol use and related consequences affect drinking-related cognitions, which is important as these cognitions may contribute to future drinking. The current study examines daily associations between alcohol use and alcohol-related negative consequences with next-day Prototype Willingness Model (PWM) social reaction pathway cognitions.

Method: Participants ages 15-25 years (N = 124, Mean age 18.7, SD = 2.87) completed daily surveys for up to three weeks (i.e., up to 11 surveys/week) using an ecological momentary assessment design. Linear mixed models and Poisson generalized mixed models were conducted to examine whether number of alcoholic drinks or number of negative alcohol-related consequences were associated with next-day PWM social reaction cognitions, including perceived vulnerability, descriptive normative perceptions of number of drinks consumed and the percentage of friends who drink, prototype favorability, prototype similarity, and willingness (i.e., openness) to drink.

Results: Within-person results indicated more alcohol use on a given day was associated with lower next-day normative perceptions of the percentage of friends who drink on that day of the week and higher prototype similarity. Furthermore, within-person results indicated that experiencing more negative alcohol-related consequences on a given day was associated with higher perceived vulnerability and lower willingness to drink the next day.

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Conflicts of Interest: None

Conclusions: Findings showed that next-day social reaction PWM cognitions were associated with prior day alcohol use and negative alcohol-related consequences, suggesting that an intervention might be timed to target drinking cognitions the morning following a drinking event, particularly after experiencing negative alcohol-related consequences.

Keywords

Alcohol use; consequences; cognitions; Prototype Willingness Model; ecological momentary assessment

1. Introduction

In the U.S., where the legal drinking age is 21, past-month alcohol use ranges from 18-29% among 8th, 10th, and 12th graders to 55.1% among 18-25-year-olds (Johnston et al., 2020; SAMHSA, 2019). Alcohol use is associated with negative consequences including missing classes, blackouts, and death (White & Hingson, 2013). The Prototype Willingness Model (PWM) is a dual-process model that examines adolescent and young adult health-risk behaviors, including alcohol use (Gerrard et al., 2008). In this study, we focused on drinking cognitions in the social reaction pathway of the PWM as they are situationally based, thus making them relevant to daily alcohol use decision-making. Willingness refers to how open an individual is to engage in a behavior (Gerrard et al., 2008). Perceived vulnerability is the extent to which an individual perceives themselves as vulnerable to risks associated with a given behavior (Gerrard et al., 2008). Descriptive normative perceptions are the perceived quantity and frequency of peer behavior (Cialdini et al., 1991). Prototype *favorability* is the degree to which an individual associates the image of the type of person who engages in a behavior with positive qualities, while prototype *similarity* is how closely the individual perceives themselves to be to the image they hold of that type of person (Gerrard et al., 2008; Litt et al., 2020). PWM social reaction pathway cognitions are associated with alcohol use among adolescents and young adults (Litt & Lewis, 2016; Todd et al., 2016), however less is known about how these cognitions are associated with behavior at the daily level.

Research examining daily-level associations between cognitions, alcohol use, and consequences is a growing area of inquiry (e.g., Lewis et al., 2016; Martins et al., 2018; Payne et al., 2016). Only Lewis et al. (2020) has examined the PWM at the daily level. On days where individuals had higher descriptive normative beliefs, lower perceived vulnerability, and more favorable prototypes than their own average, they tended to have a higher willingness to drink, consumed more drinks, and were more likely to experience negative alcohol-related consequences that day (Lewis et al., 2020).

Associations between PWM drinking cognitions, alcohol use, and negative consequences may be bidirectional. Consistent with Social Learning Theory (Bandura, 1977), drinking and experiencing negative consequences on a given day may be associated with subsequent perceived risk of consequences the next day (i.e., perceived vulnerability). While this notion has been tested in longitudinal research (Barnett et al., 2015; Read et al., 2013), one study examined associations between alcohol-related consequences and next-day alcohol expectancies at the daily level (Lee et al., 2018). Results showed that days with greater

positive or negative alcohol-related consequences were associated with higher positive and negative outcome expectancies the next day, respectively (Lee et al., 2018). Having more positive consequences was also associated with consuming more alcohol the next day, whereas negative consequences were not associated with next-day drinking (Lee et al., 2018). Notably, Lee et al. (2018) utilized a college sample and focused on alcohol expectancies and thus, to improve daily-level interventions, research should expand studies to adolescent populations in addition to focusing on other relevant drinking cognitions.

1.1 The Current Study

Using an ecological momentary assessment (EMA) methodology, the current study tested the extent to which alcohol use and consequences on a given day are associated with next-day perceived vulnerability, descriptive normative perceptions, prototype favorability, prototype similarity, and willingness to drink among adolescents and young adults. The current study complements Lewis et al. (2020) that tested the reciprocal associations in these data. Research suggests that if an individual consumes more drinks, they may perceive having a more positive experience, and thus may be more likely to drink in the future (Brooks-Russell et al., 2014; Cullum et al., 2010; Lee et al., 2018). We expected that days when individuals consumed more drinks than usual would be associated with lower perceived vulnerability, higher descriptive normative perceptions, higher prototype favorability and similarity, and a greater willingness to drink the next day (thus hypothesizing associations that reinforce subsequent decisions to drink).

In contrast to drinking itself not being seen as negative, individuals tend to find experiencing negative consequences as undesirable (Patrick & Maggs, 2011). Deviance Regulation Theory suggests that individuals want to stand out in positive ways and to not stand out in negative ways (Blanton et al., 2001, 2003). Alcohol-related consequences that are riskier than usual may be perceived by an individual as negatively standing out and subsequently influence an individual's next day normative perceptions or prototypes such that they are adjusting to be seen as more positive and less negative. Prior research has shown changes in descriptive norms regarding drinking protective behavior strategies depending on how use of strategies were framed (Dvorak et al., 2018). Although aspects of this theory may seem counterintuitive, an individual could opt to not stand out in a negative way by reducing their next day drinking cognitions, including norms. Having these 'lower-risk' cognitions would thus be perceived as not standing out in a negative way. We expected that drinking days when individuals experienced more negative consequences than usual would be associated with drinking cognitions that would reinforce decisions not to drink the next day or to not stand out in a negative way (e.g., feelings of increased vulnerability, lower peer drinking norms, lower favorability and similarity to typical drinkers, and less willingness to drink).

2. Methods

2.1 Participants and Procedures

Participants were recruited from the Seattle area through online recruitment, advertisements, referrals, and flyers. Eligibility criteria included being age 15 to 25 years, which was chosen by the larger parent study (Lewis et al., 2020) that was a pilot study. Criteria also included if

age 18 or over, reporting drinking alcohol at least once a month over the last 6 months (no drinking criteria for those aged 15 - 17). After completing an online screening survey and phone verification, eligible participants were invited to an in-person session that included a baseline assessment and EMA training. Participation included three weeks of EMA surveys (up to 3 times per day in two-hour windows: morning [6 AM – 10 AM], afternoon [12 PM – 4 PM], evening [5 PM – 10 PM]). Participants selected their morning window, and afternoon and evening windows were randomized. Survey links via text and email were sent out three times a day on Fridays and Saturdays and once per day on Sundays as well as on a random day, resulting in 11 online surveys per week for 3 consecutive weeks (possible surveys = 33). For additional information see Lewis et al. (2020).

Study procedures were IRB approved, and no adverse events were reported. Participants (N = 124) had a mean age of 18.7 years (SD = 2.87). The sample was 57.3% female and 7.3% Hispanic, 59.7% Non-Hispanic White, 15.3% Asian, 13.7% more than one race, 7.3% Black, and 4.0% Other/Mixed race.

2.2 Measures

2.2.1 Baseline Measures—Participants reported age and biological sex (0 = *Female* and 1 = *Male*).

2.2.2 Daily Measures—In the morning survey, participants reported alcohol use and consequences from the previous day. Daily reports of cognitions were utilized from the afternoon survey, as it was closer temporally to drinking events compared to morning surveys. Evening survey data was not used in the current study as this survey did not assess all cognitions. Unless otherwise noted, mean scores were analyzed.

2.2.2.1 Number of Drinks.: Participants were asked, “Since the time you woke up to the time you went to sleep yesterday, did you drink alcohol?” (0 = *No*, 1 = Yes). If yes, participants reported the number of drinks consumed from 1 (*1 drink*) to 15 (*15 or more drinks*). One drink was defined as 5 oz. of wine, 12 oz. of beer, 10 oz. of wine cooler, or 1 cocktail with 1 oz. of 100 proof liquor or 1 ¼ oz. of 80 proof liquor. Non-drinking days were recoded as having 0 drinks.

2.2.2.2 Alcohol-related Consequences.: Participants reported whether each of 12 things happened to them yesterday while they were drinking, or today because of their alcohol use yesterday (0 = *No*, 1 = *Yes*) (adapted from Lee et al. (2016)). Items were summed to create a total score.

2.2.2.3 Perceived Vulnerability.: Perceived vulnerability was measured by asking “How likely is it that something bad will happen to you tonight if you….” Four items referred to different amounts of alcoholic drinks. Two items were programmed to be sex-specific (i.e., 4 or more/1-3 for females and 5 or more/1-4 for males) whereas ‘ANY’ was shown to everyone. The fourth item referred to “do not drink alcohol” (reverse-scored). Responses ranged from 0 (N*ot at All Likely*) to 4 (*Very Likely*) (Cronbach’s α = .76).

2.2.2.4 Descriptive Normative Perceptions.: Participants were asked, “On this [DAY OF SURVEY] night, thinking of your friends, how many alcoholic drinks, on average, do you think they will individually consume?” Responses ranged from 1 (*1 drink*) to 15 (*15 or more drinks*). Using an open-ended item with responses that ranged in integers from 0% to 100% via a sliding bar, participants were asked, “What percentage of your friends do you think will drink alcohol tonight?”

2.2.2.5 Prototypes.: Prototypes were assessed by instructing participants to “Think about the typical [male/female] your age who drinks alcohol on [DAY OF SURVEY (e.g., “Friday”)].” Participants rated the degree to which each of six words describes the characteristics of that person (smart, attractive, and popular as well as impulsive, immature, and careless (reverse-scored)). Responses ranged from 0 (*Not at All*) to 4 (*Extremely*) (Cronbach’s $\alpha = .81$). A mean of the six items represented prototype favorability. Prototype similarity was assessed with a single item, “How similar are you to the TYPICAL [MALE/FEMALE] YOUR AGE who drinks alcohol on [DAY OF SURVEY]?” Responses ranged from 0 (*Not at all Similar*) to 4 (*Very Similar*).

2.2.2.6 Willingness.: Willingness to drink was measured using the question stem, “If a situation arises where you have the opportunity, how willing (i.e., open) are you to drink….” Three items referred to participants’ willingness to drink different amounts of alcoholic drinks tonight (4/5 or more, 1-3/1-4, ANY). See “perceived vulnerability” measure above for three sex-specific items. Responses were on a 5-point scale ranging from 0 (*Not at All Willing to Drink*) to 4 (*Very Willing to Drink*) (Cronbach’s $\alpha = .94$).

2.3 Analytic Plan

Because of the multilevel structure of the EMA data where days (Level 1) are nested within people (Level 2), mixed effects models with a random intercept for participants were performed to predict the effects of alcohol use and negative consequences on next-day’s PWM cognitions. Due to the lack of hypotheses regarding individual differences in predictors, random slopes were not estimated to reduce potential concerns in model estimation and over-fitting (McNeish et al., 2017). At Level 2, the number of standard drinks and number of negative consequences were grand-mean centered, allowing estimates for the effects of changes in participant-level means (i.e., did individuals who drank above the sample’s average report higher/lower cognitions?). At Level 1, the number of standard drinks and number of negative consequences were centered within-person to test daily fluctuations from a participant’s own mean (Enders & Tofighi, 2007).

Linear mixed models were fit to examine cognitions using the “nlme” R package (Pinheiro et al., 2019). Of note, Poisson generalized linear mixed models were fit to examine normative perceptions of number of drinks consumed using “lme4” R package (Bates et al., 2014). For each outcome, we fit two separate mixed effects models. One set of models used the number of drinks as a predictor, which utilized all observations. The other set of models used the number of consequences (on drinking days only) as the predictor and controlled for between- and within-person alcohol use. Model assumptions were tested. Supplemental Table 1 shows results for models using consequences as a predictor without controlling for

alcohol use. Age, sex, weekend/weekday (weekend = 1 if cognitions were measured on a Friday or Saturday and 0 otherwise), survey week (1-3), and calendar month of survey (1-12) were included as covariates in all but one model. Due to convergence issues (optimization algorithm failed to obtain parameter estimates that can converge to a global solution), survey week and month of survey were dropped in the analysis examining normative perceptions of the number of drinks consumed. For each model, days with missing values on outcomes or covariates were removed from analyses. Models utilizing the descriptive norms of the percentage of friends who drink item have smaller analytic samples due to increased missingness because of the response format (sliding bar; Funke et al., 2016).

3. Results

3.1 Descriptive Information

Daily survey response rates were similar regardless of sex and age but higher on weekends (Table 1). The analytic sample for the models with drinks as a predictor included all 124 people and had 1,641 days. The analytic sample for the models with consequences as a predictor included 84 people who reported any drinking and had 328 drinking days (there were no consequences reported for 216 of these days (66%)). There were 37 individuals who did not have any drinking days across the study period, 32 were age 15–17 (n = 52) and five were age 18-25 (n = 72). About 31% of the sample did not report any consequences over the study period. Table 2 provides descriptive statistics and correlations of all variables.

3.2 Number of Drinks Predicting PWM Cognitions

3.2.1 Perceived Vulnerability—Table 3 shows the results testing associations between number of drinks and next-day PWM social reaction pathway cognitions. Between-person results indicated that younger individuals tended to have higher levels of perceived vulnerability. Within-person results indicated that individuals tended to have lower levels of perceived vulnerability on weekends compared to weekdays. Contrary to hypotheses, within-person results indicated that number of drinks was not significant.

3.2.2 Descriptive Normative Perceptions—Between-person results indicated that individuals who were male, older, and consumed more drinks on average tended to have higher perceived descriptive norms for number of drinks consumed on days following consuming these drinks. Within-person results indicated that on weekends, individuals tended to report higher perceived descriptive norms for number of drinks consumed. Within-person number of drinks was not significant.

Between-person results indicated that individuals who were older and who consumed more alcohol on average reported higher levels of perceived percentage of friends who drink on days following consuming these drinks. Within-person results indicated consuming more alcohol than their own average was associated with lower next-day normative perceptions of percentage of friends who drink. Individuals perceived a higher percentage of their friends drinking on weekends and in later weeks in the study.

3.2.3 Prototypes—Between-person results indicated that being female and being older were associated with perceiving prototypes more favorably the next day. Within-person results indicated that individuals tended to have more favorable prototype characteristics on weekends (vs. weekdays). Number of drinks consumed was not significant.

Between-person results indicated that participants who consumed more drinks on average also tended to perceive more similarity to prototypes on days following consuming these drinks. Within-person results indicated, in support of our hypothesis, that on days when participants drank more alcohol than their own average, they tended to have higher next-day prototype similarity. Weekends were associated with higher prototype similarity the next day.

3.2.4 Willingness—Between-person results indicated that individuals who consumed more alcohol than their peers on average were more likely to report being willing to drink the following day. Contrary to hypotheses, within-person results indicated number of drinks were not associated with next-day willingness to drink. Weekends were associated with higher next-day willingness to drink whereas a later week in the study was associated with lower next-day willingness to drink.

3.3 Consequences Predicting PWM Cognitions

3.3.1 Perceived Vulnerability—Table 4 shows the results of the second set of analyses, using drinking days to examine the associations between the number of negative consequences and next-day PWM cognitions. Between-person results indicated that participants who experienced more negative consequences on average also tended to have higher levels of perceived vulnerability on days following those consequences. In support of our hypothesis, within-person results indicated that on drinking days when individuals experienced more negative consequences than their own average, they tended to have higher next-day levels of perceived vulnerability. Perceived vulnerability tended to be lower on weekends.

3.3.2 Descriptive Normative Perceptions—Between-person results indicated that participants' experience of consequences on average was not associated with perceptions of number of drinks consumed on days following those consequences. However, being male and drinking more were associated with higher next-day perceptions of number of drinks consumed. Within-person results indicated that on weekends, perceived number of drinks consumed tended to be higher. Within-person number of consequences were not significant.

Between-person results indicated that being older was associated with higher next-day perceptions of percentage of friends who drink. Participants who experienced more consequences on average did not have significant associations with perceptions of percentage of friends who drink on days following those consequences. Within-person results indicated that weekends had a positive association with perceived percentage of friends who drink. However, within-person number of consequences were not significant.

3.3.3 Prototypes—Between-person results indicated that being female was associated with perceiving prototype characteristics more favorably. Participants' experience of

consequences on average was not associated with prototype favorability on days following those consequences. Within-person results indicated that weekend characteristics of prototypes tended to be more favorable. Experiencing more consequences than their own average was not associated with next-day prototype favorability.

Between-person predictors indicate that being female and consuming more alcohol on average were both associated with higher levels of prototype similarity on days following consuming those drinks. Additionally, within-person results indicated that weekends were associated with a higher next-day perceived similarity to prototypes. Both between and within person consequences were not associated with prototype similarity the next day.

3.3.4 Willingness—Between-person results indicate average alcohol use was associated with next-day levels of willingness to drink, whereas averages consequences were not. Within-person results indicated that on drinking days when participants experienced more consequences than their own average, there was less willingness to use alcohol the next day, in support of hypotheses. On weekends, individuals tended to have higher next-day levels of willingness to drink.

4. Discussion

The current study contributes to the field by examining how daily-level drinking quantity and negative consequences may predict next-day social reaction pathway PWM cognitions. Findings support our hypothesis that consuming more drinks (than one's own average) on a given day was associated with higher next-day prototype similarity. Not supporting our hypothesis, we found that consuming more alcohol than an individual's own average was associated with lower (not higher) next-day normative perceptions of the percentage of friends who will drink later that day. This finding may stem from less regular or consistent alcohol use among adolescents. No other findings were significant when examining drinking in association with next-day cognitions.

In addition, consistent with our hypothesis, we found that experiencing more consequences was associated with higher next-day perceived vulnerability and less willingness to drink. Notably, findings suggest that prototype similarity is sensitive to previous day's alcohol use but not negative consequences. This finding is consistent with prior literature suggesting that when individuals perceive themselves to be similar to their prototype, they are more likely to engage in the behavior (i.e., drinking) associated with that prototype (Litt et al., 2020; Norman et al., 2007; Rivis et al., 2006). No other findings were significant when examining consequences in association with next-day cognitions.

Our findings highlight how weekend cognitions are associated with greater risky cognitions across the board. Targeting prevention activities to weekends when drinking is likely to occur and tailoring to when people have elevated social reaction cognitions may be warranted. Furthermore, within-person findings suggest interventions may be timed to coincide with occasions when individuals experience more negative consequences, as these days were associated with higher next-day perceived vulnerability from drinking and less willingness to drink. Experiencing consequences may be a "teachable moment" in that

adolescents and young adults are already naturally shifting their cognitions to possibly reduce risk the next day.

A limitation of this current study is the small sample size with 124 participants assessed over three consecutive weekends and on limited random weekdays. Moreover, many of the individuals who did not have any drinking days across the study period were between ages 15 and 17. Future research on larger samples of adolescents and young adults and across a longer span of days would help establish the generalizability of the findings and could allow for tests of moderating effects by sex and age. Given the nature of drinking across different age groups, associations between drinking, consequences, and next-day cognitions may be impacted by natural drinking patterns. Controlling for weekday vs. weekend, month of the year, and week in the study, helps reduce this concern.

4.1 Conclusion

The present findings underscore the importance of focusing on occasions when adolescents and young adults experience more consequences. Researchers could consider the feed-forward process between PWM social reaction pathway cognitions, alcohol use, and consequences when designing daily-level interventions to reduce alcohol use among adolescents and young adults.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Highlights:

- Daily alcohol use is associated with lower next-day alcohol use norms.
- Daily alcohol use is associated with next-day higher prototype similarity.
- Alcohol-related consequences are associated with next-day perceived vulnerability.
- Alcohol-related consequences are associated with next-day willingness to drink.

Table 1

Survey Response Rates

	# Sent	# Complete (%)	# Completed on Average (Range)	*p*-value
Total	4037	3564 (88.3%)	29 (6 – 33)	
Sex				
Male (n = 53)	1724	1488 (86.3%)	28.08 (6 – 33)	0.22
Female (n = 71)	2313	2076 (89.8%)	29.24 (9 – 33)	
Age				
15 – 17 (n = 52)	1692	1507 (89.1%)	29.44 (18 – 33)	0.63
18 – 25 (n = 72)	2345	2057 (87.7%)	29.00 (6 – 33)	
Day of Week				
Weekday	1805	1562 (86.5%)	0.86 (0 – 1)	0.001
Weekend	2232	2002 (89.7%)	0.90 (0 – 1)	

Note: The maximum number of surveys a participant could receive was 33. Weekends had 3 surveys sent out while some weekdays only had 1 survey sent out. To account for this, day of week statistics utilize daily-level response rate (# of responses / # of total surveys sent out on that day). Two sample *t*-test was performed to obtain the *p*-values.

Table 2

Descriptive statistics and correlations.

	N days	M	*SD*	Range	Skew	Kurtosis	1	2	3	4	5	6	7
1. # of Drinks	1,641	0.86	2.18	0–15	3.33	12.52	–						
2. # of Consequences	328	0.90	1.66	0–8	2.11	3.95	0.48	–					
3. Perceived Vulnerability	980	2.19	0.90	0–4	0.19	−0.60	−0.16	0.25	–				
4. # of Drinks Normative Perceptions	975	2.42	2.51	0–15	1.35	2.59	0.37	0.05	−0.31	–			
5. % Drink Normative Perceptions	826	41.60	25.77	0–100	0.10	−1.09	0.20	−0.02	−0.27	0.62	–		
6. Prototype Favorability	979	2.06	0.69	0–4	−0.45	0.42	0.18	−0.06	−0.31	0.36	0.27	–	
7. Prototype Similarity	983	1.06	1.14	0–4	0.70	−0.65	0.31	0.14	−0.33	0.42	0.31	0.48	–
8. Willingness	990	1.17	1.36	0–4	0.81	−0.73	0.26	−0.19	−0.34	0.49	0.45	0.39	0.51

Note. All correlations are significant at $p < 0.05$.

Table 3

Number of Drinks Predicting Social Reaction PWM Cognitions

	Perceived Vulnerability (N1 = 124; N2 = 976) b (SE)	# of Drinks Normative Perceptions (N1 = 124; N2 = 971) b (SE)	% Drink Normative Perceptions (N1 = 119; N2 = 822) b (SE)	Prototype Favorability (N1 = 124; N2 = 975) b (SE)	Prototype Similarity (N1 = 124; N2 = 979) b (SE)	Willingness (N1 = 124; N2 = 985) b (SE)
Goodness of Fit						
ICC	0.62	0.56	0.48	0.68	0.65	0.43
R^2 Conditional	0.63	0.69	0.69	0.73	0.71	0.51
R^2 Marginal	0.13	0.38	0.40	0.24	0.19	0.24
RMSE	0.52	1.44	14.04	0.34	0.57	0.90
Intercept	2.46 (0.24)***	−0.23 (0.10)*	19.09 (6.47)**	2.06 (0.17)***	1.14 (0.28)***	0.99 (0.35)**
Person Level						
Sex	−0.14 (0.13)	0.38 (0.14)**	3.06 (3.00)	−0.27 (0.09)**	−0.19 (0.16)	0.04 (0.15)
Age	−0.09 (0.03)***	0.12 (0.03)***	2.88 (0.62)***	0.08 (0.02)***	0.02 (0.03)	0.02 (0.03)
Alcohol Use	−0.06 (0.05)	0.30 (0.05)***	6.29 (1.14)***	0.06 (0.04)	0.29 (0.06)***	0.43 (0.06)***
Daily Level						
Weekend vs Weekday	−0.13 (0.04)***	0.82 (0.06)***	24.32 (1.24)***	0.34 (0.03)***	0.55 (0.04)***	0.77 (0.07)***
Month of Year	−0.02 (0.05)	----	−0.66 (1.39)	−0.02 (0.04)	−0.09 (0.06)	−0.03 (0.08)
Week in Study	−0.01 (0.03)	----	2.50 (0.74)***	0.00 (0.02)	0.03 (0.03)	−0.09 (0.04)*
Alcohol Use	−0.01 (0.01)	0.00 (0.01)	−0.75 (0.27)**	−0.01 (0.01)	0.03 (0.01)**	−0.01 (0.02)

Note. The analytic sample for this model included 124 people and 1,641 days. We controlled for age, sex (male = 1, female = 0), weekend/weekday, week in study, and month as covariates in all but 1 model. Month of year and week in study were dropped in the # of drinks normative perceptions analysis due to convergence.

*$p < .05$

**$p < .01$

***$p < 0.001$. N1 = Number of people; N2 = Number of observations (days). ICC = Intraclass Correlation Coefficients. RMSE = Root Mean Squared Error.

Table 4

Number of Negative Alcohol Consequences Predicting Social Reaction PWM Cognitions

	Perceived Vulnerability (N1 = 73; N2 = 188) b (SE)	# of Drinks Normative Perceptions (N1 = 72; N2 = 185) b (SE)	% Drink Normative Perceptions (N1 = 72; N2 = 185) b (SE)	Prototype Favorability (N1 = 73; N2 = 187) b (SE)	Prototype Similarity (N1 = 73; N2 = 189) b (SE)	Willingness (N1 = 73; N2 = 188) b (SE)
Goodness of Fit						
ICC	0.73	0.54	0.23	0.73	0.71	0.26
R^2 Conditional	0.77	0.45	0.61	0.75	0.75	0.42
R^2 Marginal	0.12	0.20	0.27	0.16	0.24	0.16
RMSE	0.29	1.40	12.21	0.21	0.50	0.94
Intercept	2.56 (0.37)***	0.72 (0.15)***	22.65 (11.13)*	2.62 (0.25)***	1.93 (0.57)***	0.77 (0.73)
Person Level						
Sex	−0.04 (0.16)	0.35 (0.12)**	0.42 (4.09)	−0.23 (0.11)*	−0.57 (0.24)*	0.03 (0.25)
Age	−0.04 (0.04)	0.03 (0.02)	3.45 (0.94)***	0.04 (0.02)	−0.04 (0.05)	0.08 (0.06)
Alcohol Use	−0.06 (0.04)	0.07 (0.03)**	0.80 (0.93)	0.03 (0.02)	0.25 (0.05)***	0.16 (0.06)**
Alcohol Consequences	0.20 (0.07)**	0.04 (0.05)	3.31 (1.90)	−0.06 (0.05)	−0.14 (0.11)	−0.04 (0.12)
Daily Level						
Weekend vs Weekday	−0.18 (0.09)*	0.41 (0.13)**	26.49 (3.32)***	0.17 (0.06)**	0.33 (0.14)*	1.06 (0.24)***
Month of Year	−0.08 (0.08)	---	0.11 (2.53)	−0.07 (0.06)	−0.13 (0.13)	0.03 (0.16)
Week in Study	−0.01 (0.04)	---	1.54 (1.62)	−0.02 (0.03)	0.07 (0.07)	−0.04 (0.11)
Alcohol Use	−0.03 (0.02)	0.02 (0.02)	0.19 (0.61)	0.00 (0.01)	0.03 (0.03)	0.03 (0.04)
Alcohol Consequences	0.08 (0.03)**	−0.05 (0.04)	−1.86 (1.12)	0.00 (0.02)	0.08 (0.05)	−0.22 (0.08)**

Note. The analytic sample for this model included 84 people and 328 drinking days. We controlled for alcohol use, age, sex (male = 1, female = 0), weekend/weekday, week in study, and month as covariates in all but 1 model. Month of year and week in study were dropped in the # of drinks normative perceptions analysis due to convergence.

* $p < .05$.

** $p < .01$

*** $p < 0.001$. N1 = Number of groups (people); N2 = Number of observations (days). ICC = Intraclass Correlation Coefficients. RMSE = Root Mean Squared Error.