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Alcohol-Related Facebook Activity Predicts Alcohol Use Patterns in College Students

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Abstract

The purpose of this study was to determine if a brief 10-item alcohol-related Facebook® activity (ARFA) questionnaire would predict alcohol use patterns in college students ($N = 146$). During a single laboratory session, participants first privately logged on to their Facebook® profiles while they completed the ARFA measure, which queries past 30 day postings related to alcohol use and intoxication. Participants were then asked to complete five additional questionnaires: three measures of alcohol use (the Alcohol Use Disorders Identification Test [AUDIT], the Timeline Follow-Back [TLFB], and the Personal Drinking Habits Questionnaire [PDHQ]), the Barratt Impulsiveness Scale (BIS-11), and the Marlowe-Crowne Social Desirability Scale (MC-SDS). Regression analyses revealed that total ARFA scores were significant predictors of recent drinking behaviors, as assessed by the AUDIT, TLFB, and PDHQ measures. Moreover, impulsivity (BIS-11) and social desirability (MC-SDS) did not predict recent drinking behaviors when ARFA total scores were included in the regressions. The findings suggest that social media activity measured via the ARFA scale may be useful as a research tool for identifying risky alcohol use.

Keywords

Facebook®; AUDIT; Alcohol; Social media; Hazardous drinking; Risky drinking

Introduction

The use of social media websites has become widespread among all segments of the population. Despite the rise in a variety of new social media platforms, Facebook® remains the most popular social media website. The most recent 2014 Pew Research Center survey of Americans of all ages revealed that 71% of internet users have a profile on Facebook® (Duggan, Ellison, Lampe, Lenhart, & Madden, 2015). Of these profile owners, 70% visit this social media website daily. Women and individuals ages 18 to 29 are the demographic groups most likely to use the website. In contrast, 28% or fewer of internet-using Americans report using the most popular other social media websites including Pinterest®, LinkedIn®, Instagram®, and Twitter® (Duggan et al., 2015).

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Despite the fact that young adults are frequent users of social media (Duggan et al., 2015), and are at high risk for hazardous alcohol use (Marczinski, Grant & Grant, 2009), there is a paucity of research examining whether social media online activity has utility in identifying risky alcohol use using a standardized brief measure. While research on what social media can tell us about psychology is still emerging, there have been some promising developments. Personality researchers have found that the unbiased observer ratings of profile owner Facebook® postings correlate with the responses given by profile owners on standardized personality tests measuring traits such as extraversion, conscientiousness, and narcissism (Buffardi & Campbell, 2009; Ivcevic & Ambady, 2012). In the domain of risky alcohol use, it has become clear that retrospective reporting of alcohol use may underestimate the amount of alcohol that is being consumed in real-time as measured via Smartphone technology (Monk, Heim, Qureshi & Price, 2015). In most cases, users post on social media in 'real time' suggesting that alcohol-related postings on social media could yield rich information about hazardous drinking practices that more closely reflect real-time alcohol use (Moreno, Cox, Young, & Haaland, 2015).

There is some evidence that postings on Facebook® may provide information about addictive behaviors including hazardous alcohol use. Several studies have revealed that the Facebook® profiles of underage college students often include alcohol-related texts or photos (Moreno, Christakis, Egan, Brockman, & Becker, 2012a; Moreno, D'Angelo, Kacvinsky, Kerr, Zhang, & Eickhoff, 2014; Oshri, Himelboim, Kwon, Sutton, & Mackillop, 2015; Ridout, Campbell, & Ellis, 2012). In addition, the results of two studies (Moreno et al., 2012a; Ridout et al., 2012) revealed that alcohol references made on Facebook® profiles were related to Alcohol Use Disorders Identification Test (AUDIT) scores, suggesting that Facebook® has potential utility in identifying underage college student problem drinkers.

While the above studies suggest that social media may have utility in identifying at-risk hazardous drinkers, a few significant methodological issues need to be addressed. First, there are generalizability questions about the existing work. For example, the Moreno et al. (2012a) study only included underage college students with publicly available (i.e., no privacy setting) Facebook® profiles. It is plausible that this sample may have been uniquely high on the trait of impulsivity, which may partially explain why the participants failed to see the implications of posting about underage drinking in the public domain. Therefore, it remains unknown if alcohol-related postings of other social media users would also identify hazardous drinkers. There is also the concern from previous research that responses to the AUDIT were contaminated by social desirability bias (i.e., faking good or faking bad) once participants were contacted by a researcher for a study based on their public Facebook® profile activities. Given that there are existing measures to assess if participants are prone to social desirability biases, it would be wise to include such a measure in further work. Finally, it would be helpful to know if Facebook® postings related to alcohol use coincide with other widely used standardized measures of alcohol use and alcohol-related problems.

Therefore, the purpose of this study was to determine if a brief alcohol-related Facebook® activity (ARFA) questionnaire, developed for this study, provides unique information that predicts alcohol use and alcohol-related problems as assessed by three well-validated and widely used measures. A sample of college students ($N = 146$) was recruited for a

laboratory-based session during which they were asked to complete the ARFA questionnaire while privately viewing their Facebook® profile. After completing the ARFA, participants were asked to complete five other well-validated questionnaires. The Alcohol Use Disorders Identification Test (Babor, Higgins-Biddle, Saunders & Monteiro, 1989), the Timeline Follow-back (Sobell & Sobell, 1992), and the Personal Drinking Habits Questionnaire (Vogel-Sprott, 1992) provided information about various aspects of recent alcohol consumption. In addition, participants completed the Barratt Impulsivity Scale version 11 (Patton, Stanford, & Barratt, 1995). In previous research, regression analyses revealed that BIS-11 total scores predict several aspects of recent drinking behaviors (Henges & Marczinski, 2012). Finally, participants completed the Marlow-Crowne Social Desirability Scale (Crowne & Marlowe, 1960). This measure was included to address the question whether the information that individuals reported appeared to reflect real behaviors or had been modified for the purposes of impression management (i.e., faking good or faking bad). Therefore, this study examined recent alcohol-related social media activity using a new questionnaire to determine if it could predict alcohol use patterns using standardized measures, while also including measures of impulsivity and social desirability biases.

Methods

Participants

In this study, 146 participants (61 males) were recruited from a large undergraduate psychology research pool (approximately 2000 potential participants) at Northern Kentucky University. The sample self-reported race as white (n = 118), black (n = 17), Asian (n = 3), or other (n = 8). Self-reported ethnicity revealed a small number of individuals who considered themselves Hispanic (n = 3). The mean (SD) age of our sample was M = 19.59 (2.87). Sample demographic characteristics were similar to the entire university population. The study was approved by the university's Institutional Review Board and all participants provided signed informed consent prior to participation. The recruiting announcement stated that past month activity on Facebook® was a requirement for participating in this study examining social media, personality, and alcohol use. Prior work from our lab has established that the drinking habits of the potential pool of participants that this sample was recruited from resemble the typical drinking habits of U.S. college students (Marczinski, 2011).

Materials

Alcohol-Related Facebook® Activity (ARFA) Questionnaire—This brief 10-item scale (see Table 1) was developed for this study to ask participants to self-report their past 30 day Facebook® written postings and photos/images related to alcohol use and intoxication. A total score was calculated based on responses to the alcohol questions one through eight. Items included on the ARFA scale were chosen after exploratory factor analysis was completed on a longer scale that was piloted to a larger online sample of college students (n = 392).

Alcohol Use Disorders Identification Test (AUDIT)—The AUDIT is a widely used and freely available alcohol abuse screening assessment (Babor et al., 1989). Participants are

asked to answer questions about their drinking habits and problem drinking tendencies. Response options included *never, less than monthly, monthly, weekly,* or *daily or almost daily*. A score of eight or higher indicates hazardous drinking.

Timeline Follow-Back (TLFB)—The TLFB is a self-report measure of participants' past 30-day alcohol use (Sobell & Sobell, 1992). Using a calendar, participants are asked to indicate the number of drinks consumed each day over the past month. Measures include maximum number of continuous days of drinking, maximum number of continuous days of abstinence, total number of drinking days, total number of drinks consumed, highest number of drinks consumed in one day, total number of heavy drinking (five or more standard drinks) days, and total number of "drunk" (i.e., felt intoxicated) days.

Personal Drinking Habits Questionnaire (PDHQ)—The PDHQ is a self-report measure that asks participants to respond to some demographic questions (age, race, ethnicity, body weight) and then describe their alcohol use history and typical current drinking habits (Vogel-Sprott, 1992). Measures include history (in months) of alcohol use, customary number of standard drinks consumed on a typical drinking occasion, duration (in hours) of a typical drinking occasion, and weekly frequency of drinking. Information provided, including the actual body weight (measured on a scale in the lab), is used to calculate the customary alcohol dose (i.e., ml abs. alcohol/kg).

Barratt Impulsiveness Scale (BIS-11)—The BIS-11 is a 30-item self-report scale that has been used for over 50 years to assess the personality dimension of impulsivity (Patton et al., 1995; Stanford, Mathias, Dougherty, Lake, Anderson & Patton, 2009). Participants rate the statements on a four-point Likert scale ranging from *rarely/never* to *almost always/always*. The higher the summed score, the higher self-reported level of impulsivity (score ranges from 30 to 120).

Marlowe-Crowne Social Desirability Scale (MC-SDS)—The MC-SDS is a 33-item self-report scale that measures social desirability bias independent of psychopathology (Crowne & Marlowe, 1960). Participants respond to each statement with either a true or false answer. For this measure, higher summed scores indicate that participants are misrepresenting themselves in order to manage their self-presentation.

Procedure

Participants were recruited from the undergraduate research pool and selected times to attend a one-hour laboratory session that was convenient to their schedules. Participants were informed that they must have an active Facebook® account (i.e., use within the past 30 days) in order to participate. After informed consent, participants were seated in a private testing room with a laptop computer with internet access. They were instructed to wait for the research assistant to leave the room and then log on to their personal Facebook page and complete the ARFA questionnaire. After the ARFA measure was completed, participants were given the AUDIT, TLFB, PDHQ, BIS-11, and MC-SDS questionnaires (with order counterbalanced between subjects). Upon completion of the study, participants were debriefed and received partial course credit for their participation.

Results

Demographic Characteristics

Table 2 presents the participants' demographic characteristics and questionnaire responses for the male and female participants. Independent samples *t* tests were used to assess gender differences on these measures. The table shows that men reported significantly more TLFB total number of drinks, TLFB higher maximum number of drinks, and fewer ARFA-assessed days per week on Facebook®, *p*s < .035. Overall, the drinking habits of these participants were typical of many college populations. The sample included 36 abstainers (14 men) as determined by the self-reported zero alcoholic drinks consumed in the past 30 days on the TLFB. The sample also included 50 hazardous drinkers (25 men) as determined by an AUDIT score of eight or higher.

Table 3 presents the correlations among all of the individual questions from the ARFA. The responses to all of the alcohol questions on the ARFA were significantly correlated. Therefore, it was decided that a total score for the ARFA was calculated for these alcohol questions (1–8), before the multiple regressions were conducted.

Regression Analyses

Table 4 reports the results of separate multiple regression analyses conducted to evaluate if ARFA total scores, BIS-11 total scores, MC-SDS scores, and gender would predict various aspects of drinking behaviors reported on the AUDIT, TLFB, and PDHQ. When the criterion variable was the AUDIT total score, the regression was significant, $F(4,141) = 9.23$, $p < .001$, with only the ARFA total score as a significant predictor, $p < .001$.

As shown in Table 4, ARFA scores were significant predictors for all aspects of recent alcohol consumption as measured by the TLFB measure. When the criterion variable was the TLFB continuous days of drinking, the regression was significant, $F(4,141) = 5.68$, $p < .001$, with only the ARFA total score as a significant predictor, $p < .001$. When the criterion variable was the TLFB continuous days of abstinence, the regression was significant, $F(4,141) = 6.14$, $p < .001$, with only the ARFA total score as a significant predictor, $p < .001$. When the criterion variable was the TLFB total number of drinking days, the regression was significant, $F(4,141) = 8.56$, $p < .001$, with only the ARFA total score as a significant predictor, $p < .001$. When the criterion variable was the TLFB total number of drinks consumed, the regression was significant, $F(4,141) = 8.65$, $p < .001$, with both the ARFA total score and gender as a significant predictors, *p*s < .02. When the criterion variable was the TLFB highest number of drinks in one day, the regression was significant, $F(4,141) = 5.89$, $p < .001$, with the ARFA total score and gender as significant predictors, *p*s < .003. When the criterion variable was the TLFB number of heavy drinking (i.e., 5 or more drinks) days, the regression was significant, $F(4,141) = 5.69$, $p < .001$, with only the ARFA total score as a significant predictor, $p < .001$. When the criterion variable was the TLFB number of drunk days, the regression was significant, $F(4,141) = 8.93$, $p < .001$, with only the ARFA total score as a significant predictor, $p < .001$.

ARFA scores were also significant predictors for PDHQ alcohol consumption measures, except history of drinking. When the criterion variable was the PDHQ typical number of

drinks per occasion, the regression was significant, $F(4,141) = 6.16$, $p < .001$, with the ARFA total score and gender as significant predictors, ps < .020. When the criterion variable was the PDHQ typical dose, the regression was significant, $F(4,141) = 3.59$, $p = .008$, with the ARFA total score and BIS-11 total score as significant predictors, ps < .042. When the criterion variable was the PDHQ weekly frequency of drinking, the regression was significant, $F(4,141) = 3.59$, $p = .008$, with only the ARFA total score as a significant predictor, $p = .004$. When the criterion variable was the PDHQ history of drinking, the regression was not significant, $p = .168$.

Discussion

The purpose of this study was to determine if our newly developed alcohol-related Facebook® activity (ARFA) questionnaire predicts alcohol use and alcohol-related problems. The results indicated that ARFA total scores predicted all aspects of alcohol consumption, as measured by the AUDIT, TLFB, and PDHQ, except for the PDHQ history (in months) of regular drinking. In essence, our measure of social media activity related to alcohol use appears to robustly capture information that reflects recent alcohol consumption patterns and does not reflect trait impulsivity or social desirability biases. In this study, participants who had an AUDIT score of eight or higher (indicating hazardous drinking) also had an ARFA total score of five or higher. Thus, this initial research suggests that the ARFA measure may be useful in identifying individuals who are engaging in hazardous drinking.

The current study has a few limitations. First, we did not ask participants about their current privacy settings. This choice reflected the decision to reassure all participants that we would never look at their Facebook® activity, during the study or after. However, the failure to ask about this information may partly explain why BIS-11 scores did not predict recent drinking behaviors, except for the PDHQ typical dose of alcohol, as shown in other research (Henges & Marczinski, 2012). Future work should ask about privacy settings and examine how the choices regarding social media privacy correlates with impulsivity measures. In addition, our sample only included college students. However, hazardous drinking, while common in college students, is also common in other age groups. Future research should determine if these findings generalize to other demographic groups, especially since there is rise in the marketing of alcohol brands using social media websites (Winpenny, Marteau & Nolte, 2014). For example, Jones et al. (2015) reported that about 20% of Facebook® users actively interacted with an alcohol brand on Facebook®, and there was a strong association between these alcohol brand interactions and problematic drinking. Given targeted advertising algorithms incorporated into social media websites, users who post about alcohol should subsequently see more alcohol brand advertising, although this needs to be empirically tested. Furthermore, the findings of a recent study has demonstrated that alcohol displays on Facebook® at a time prior to starting college will predict binge drinking one year into college (D'Angelo, Kerr, & Moreno, 2014). Thus, it would be interesting to see if a longitudinal study using our ARFA measure may help inform us about who may be most at risk for developing serious alcohol problems. Finally, the ARFA questions only asked about alcohol postings on Facebook®. It would be instructive to determine if other types of addictive behaviors (e.g., smoking cigarettes or using illicit drugs) would be revealed on

Facebook® or other social media platforms (e.g., Instagram®, Twitter®, or Snapchat®) in a research or screening context.

While there were limitations to the current study and more research is needed before this measure is used in a clinical setting, the findings are intriguing because they suggest that this measure identifies current drinking behaviors as well as other measures that are typically used in clinical settings or as a source of information leading to referral for evaluation. For example, alcohol education programs for college students might benefit from raising students' awareness of the implications of social media posts about drinking, teaching them that such posts may in fact indicate the need for follow-up. Similarly, peer advisors such as residence assistants may be trained to pay attention to fellow students' Facebook® posts and use them as a jumping-off point for conversations about reducing alcohol-related harm. Initial work in this area suggests that alcohol-related information from social media sites may be potentially useful if the approach is done with care by someone known to the social media user (Kacvinsky & Moreno, 2014; Moreno et al., 2012b).

In a similar vein, discussions of Facebook® posts may have clinical utility for work with young clients. Therapists often have to spend a significant amount of time developing rapport with young clients who do not feel that they have drinking problems (Winograd & Sher, 2015), and the administration of standardized measures such as the AUDIT or TLFB may contribute to this client resistance by making clients feel they are being treated "like an alcoholic." By contrast, asking young clients to complete the ARFA measure may instead encourage a more open dialogue between therapist and client. It seems plausible that a discussion about recent Facebook® activity and the use of the ARFA measure will facilitate the therapist's goal of placing the young client's excessive drinking activities in the context of those of similar age peers, but without the stigma that may be triggered by more "clinical" measures. The findings of one recent study suggests that young adults prefer discussion their alcohol use in the context of social media postings but view discussion about drinking in a standard interview format as unpleasant (Lyons, Goodwin, McCreanor, & Griffin, 2015). The ARFA is still preliminary in its development and should not replace the standard screening measures, but it may provide a starting point of discussions about problematic drinking that leads to less resistance from young clients. Future studies are necessary to determine the ARFA's clinical utility, but given that developing rapport between a therapist and younger client is challenging, any tool that could facilitate this process should be examined further.

Conclusions

The newly developed brief 10-item alcohol-related Facebook® activity (ARFA) questionnaire predicted alcohol use patterns in college students. The results of the regression analyses revealed that total ARFA scores were significant predictors of recent drinking behaviors, as assessed by the AUDIT, TLFB, and PDHQ measures. Moreover, impulsivity (BIS-11) and social desirability (MC-SDS) did not predict recent drinking behaviors when ARFA total scores were included in the regressions. The findings suggest that social media activity measured via the ARFA scale may be useful in research examining hazardous drinking.

Acknowledgments

Declaration of Interest Statement

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Table 1

The 10-item alcohol-related Facebook® activity (ARFA) questionnaire was developed for this study. Participants were required to have logged into their Facebook® within the past 30 days in order to complete this questionnaire.

Participant Instructions: *Once I leave the room, please log onto your personal Facebook® page. Looking over posts and pictures that have been added to your page over the 30 last days, please answer the following 10 questions. Do not answer this questionnaire if you have not used Facebook® during the past 30 days. Once this is completed, you can log out of Facebook® and clear the browser's history. Please only look at activity during the past 30 day window which includes today's date of _____ and 30 days ago is _____*	
Question	**Response**
1. During the past 30 days, did you write a post on your wall or get tagged in a post that mentioned alcohol consumption?	Yes or No (circle)
2. If you answer yes to question 1, how many alcohol posts were made?	
3. During the past 30 days, did you write a post on your wall or get tagged in a post that mentioned getting drunk/wasted/intoxicated?	Yes or No (circle)
4. If you answer to yes to question 3, how many drunk posts were made?	
5. During the past 30 days, did you post a photo/image or get tagged in a photo/image that included an image of drinking or alcohol?	Yes or No (circle)
6. If you answered yes to question 5, how many alcohol photos/images were posted?	
7. During the past 30 days, did you post a photo/image or get tagged in a photo/image where you appeared drunk/wasted/intoxicated?	Yes or No (circle)
8. If you answered yes to question 7, how many drunk photos/images were posted?	
9. How many days during a week do you use Facebook®? (answer 1–7)	
10. On a typical day when you log on to Facebook®, how many minutes to you spend on Facebook®?	
Scoring Instructions (not shown to participants): *Questions 1, 3, 5, and 7 are scored with 1 = yes and 0 = no. The scores for questions 2, 4, 6, and 8 are as given by the participant.* *ARFA total score = sum of questions 1–8.* In this study, participants who had an AUDIT score of 8 or higher (indicating hazardous drinking) also had an ARFA total score of 5 or higher (n = 50, 25 males).	

Table 2

Mean (SD) demographic and questionnaire responses for the male and female participants. Gender differences for the measures were evaluated with independent samples t-tests (2-tailed).

	Males (*N* = 61)		Females (*N* = 85)		
	M	***SD***	***M***	***SD***	***p***
Age (years)	20.00	2.58	19.29	3.04	.143
AUDIT total score	6.72	4.43	5.81	4.73	.235
Personal Drinking Habits Questionnaire					
History (months regular drinking)	41.44	31.30	33.40	34.78	.153
Self-reported alcohol dose (ml/kg)	1.02	0.61	0.85	0.56	.085
Weekly frequency of drinking	0.81	0.80	0.62	0.79	.162
Duration (hours)	3.15	2.14	3.71	5.30	.439
Timeline follow-back (past 30 days)					
Continuous days of drinking	1.15	0.95	1.14	1.00	.969
Continuous days of abstinence	16.41	8.96	19.08	8.65	.072
Total no. of drinking days	3.18	2.98	2.74	3.02	.385
Total no. of drinks	19.61	22.21	11.87	19.28	**.026**
Highest no. of drinks in one day	7.39	7.48	4.42	4.52	**.003**
Heavy drinking (5+) days	1.72	2.03	1.22	2.07	.151
Drunk days	1.72	2.08	1.33	2.01	.254
BIS-11 total score	55.05	7.40	53.64	8.62	.302
Marlowe-Crowne Social Desirability score	17.61	4.20	17.22	5.29	.640
Facebook Questionnaire					
Any alcohol posts? (yes=1, no=0)	0.18	0.39	0.15	0.36	.662
No. of alcohol posts	0.43	1.12	0.39	1.30	.854
Any drunk posts? (yes=1, no=0)	0.08	0.28	0.11	0.31	.631
No. of drunk posts?	0.15	0.60	0.22	0.78	.524
Any alcohol photos? (yes=1, no=0)	0.18	0.39	0.27	0.45	.206

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	Males (N = 61)		Females (N = 85)		
	M	*SD*	*M*	*SD*	*p*
No. of alcohol photos	0.85	4.00	1.01	2.72	.775
Any drunk photos? (yes=1, no=0)	0.23	0.42	0.18	0.38	.432
No. of drunk photos	1.07	4.08	0.88	3.21	.762
ARFA Total score (alcohol questions 1–8)	3.16	6.63	3.21	6.91	.967
No. days/week on Facebook®	5.40	2.15	6.10	1.81	**.035**
Duration of typical visit (min.)	56.66	183.16	60.14	157.68	.902

Table 3

Correlations among Facebook measures related to alcohol consumption during the last 30 days. Participants privately logged on to their Facebook account in the lab to complete these questions.

Measure	1	2	3	4	5	6	7	8	9	10
1. Any alcohol posts? (yes/no)	-									
2. No. of alcohol posts	.75**	-								
3. Any drunk posts? (yes/no)	.42**	.46**	-							
4. No. of drunk posts	.35**	.51**	.84**	-						
5. Any alcohol photos? (yes/no)	.37**	.36**	.32**	.26**	-					
6. No. of alcohol photos	.20*	.18*	.20*	.21**	.52**	-				
7. Any drunk photos? (yes/no)	.24**	.16	.30**	.33**	.34**	.27**	-			
8. No. of drunk photos	.03	.08	.34**	.35**	.20*	.20	.54**	-		
9. No. days/week on Facebook	.07	.11	.09	.08	.06	.05	.04	.07	-	
10. Duration of typical visit (min.)	.16	.16	.00	−.02	.07	−.02	.08	.02	.14	-

Notes.

Correlations amount Facebook measures for all participants (N = 146) are presented below the diagonal;

** correlation is significant at the .01 level (2-tailed);

* correlation is significant at the .05 level (2-tailed)

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Table 4

Multiple regression analyses (N = 146) conducted to predict Alcohol Use Disorders Identification Tests (AUDIT) total scores, Timeline Follow-back (TLFB), and Personal Drinking Habits Questionnaire (PDHQ) measures related to alcohol consumption.

Variable	*B*	SE *B*	β	*t*	*p*
Criterion: AUDIT total score					
ARFA total score	.263	.050	.391	5.204	**<.001**
BIS-11 total score	.060	.047	.107	1.266	.208
Social Desirable Scale total score	−.125	.079	−.133	−1.588	.115
Gender	−.886	.695	−.096	−1.275	.204
Criterion: TLFB continuous days of drinking					
ARFA total score	.053	.011	.370	4.725	**<.001**
BIS-11 total score	.000	.011	−.002	−0.021	.984
Social Desirable Scale total score	−.009	.018	−.046	−0.524	.601
Gender	−.013	.155	−.006	−0.082	.935
Criterion: TLFB continuous days of abstinence					
ARFA total score	−.435	.102	−.333	−4.280	**<.001**
BIS-11 total score	−.039	.095	−.035	−0.406	.685
Social Desirable Scale total score	.179	.159	.098	1.126	.262
Gender	2.707	1.400	.151	1.934	.055
Criterion: TLFB total no. of drinking days					
ARFA total score	.189	.034	.427	5.649	**<.001**
BIS-11 total score	.025	.031	.068	0.807	.421
Social Desirable Scale total score	−.006	.052	−.010	−0.113	.910
Gender	−.415	.462	−.068	−0.898	.371
Criterion: TLFB total no. of drinks					
ARFA total score	1.230	.232	.400	5.292	**<.001**
BIS-11 total score	.093	.217	.036	0.428	.669
Social Desirable Scale total score	.214	.363	.050	0.590	.556
Gender	−7.586	3.201	−.180	−2.370	**.019**
Criterion: TLFB highest no. of					

Variable	*B*	SE *B*	β	*t*	*p*
drinks in one day					
ARFA total score	.261	.070	.290	3.721	**<.001**
BIS-11 total score	−.029	.066	−.038	−0.439	.661
Social Desirable Scale total score	−.041	.110	−.033	−0.377	.707
Gender	−3.042	.967	−.247	−3.145	**.002**
Criterion: TLFB heavy drinking (5+) days					
ARFA total score	.106	.024	.347	4.436	**<.001**
BIS-11 total score	.014	.022	.057	0.652	.515
Social Desirable Scale total score	.013	.037	.032	0.361	.719
Gender	−.477	.328	−.115	−1.456	.148
Criterion: TLFB drunk days					
ARFA total score	.128	.023	.424	5.635	**<.001**
BIS-11 total score	.020	.021	.080	0.944	.347
Social Desirable Scale total score	.045	.035	.108	1.283	.202
Gender	−.352	.313	−.085	−1.127	.262
Criterion: PDHQ typical no. of drinks/occasion					
ARFA total score	.068	.029	.184	2.368	**.019**
BIS-11 total score	.052	.027	.170	1.945	.054
Social Desirable Scale total score	−.005	.045	−.010	−0.112	.911
Gender	−1.377	.395	−.273	−3.486	**.001**
Criterion: PDHQ typical dose					
ARFA total score	.017	.007	.191	2.381	**.019**
BIS-11 total score	.013	.007	.186	2.059	**.041**
Social Desirable Scale total score	.001	.011	.010	0.116	.908
Gender	−.151	.096	−.127	−1.574	.118
Criterion: PDHQ weekly frequency of drinking					
ARFA total score	.028	.009	.238	2.964	**.004**
BIS-11 total score	.015	.009	.154	1.710	.089
Social Desirable Scale total score	.015	.015	.089	0.986	.326
Gender	−.162	.130	−.100	−1.242	.216

Variable	*B*	SE *B*	β	*t*	*p*
Criterion: PDHQ history (months) of regular drinking					
ARFA total score	.638	.408	.129	1.564	.120
BIS-11 total score	−.510	.381	−.124	−1.341	.182
Social Desirable Scale total score	−.019	.636	−.003	−0.031	.976
Gender	−8.802	5.613	−.130	−1.568	.119

Notes. AUDIT total score, R^2 = .208

TLFB continuous days of drinking, R^2 = .139; continuous days of abstinence, R^2 = .148; total no. of drinking days, R^2 = .195; total no. of drinks, R^2 = .197; highest no. of drinks in one day, R^2 = .143; heavy drinking (5+ drinks) days, R^2 = .139; drunk days, R^2 = .202;

PDHQ typical number of drinks/occasion, R^2 = .149; typical dose, R^2 = .093; weekly frequency, R^2 = .092; history (months) of regular drinking, R^2 = .044