

The Self-Rating of the Effects of Alcohol Questionnaire Predicts Heavy Episodic Drinking In a High-Risk Eating Disorder Population

Aimee Zhang, BA^{1*}
Aaron J. Fisher, PhD²
Jakki O. Bailey, MA¹
Andrea E. Kass, MA³
Denise E. Wilfley, PhD^{3,4}
C. Barr Taylor, MD¹

ABSTRACT

Objective: Heavy episodic drinking (HED) is a serious problem among college women at high-risk for developing eating disorders (EDs). The main objectives of this study are to determine the relationship of the self-rating of the effects of alcohol (SRE) questionnaire and HED over time, and to determine the effects of relationship breakups on HED among college-aged women at high-risk for EDs.

Method: Data collected from 163 participants in a randomized controlled trial evaluating the effectiveness of an ED prevention program were used in the analyses. Measures included the SRE, obtained at baseline, and self-reports of the number of HED episodes and relationship breakups each month for the past 12 months.

Results: Generalized linear mixed-effect regression models with Poisson

distribution were conducted to test the effects of several variables on reported HED episodes over 12 months. Analyses demonstrated that SRE scores and the presence of a breakup predicted increased HED over time.

Discussion: The SRE may be useful in identifying individuals at risk of or with EDs who are at increased risk of HED. Furthermore, relationship breakups predict HED. Findings from the current study could be used to inform clinical interventions for this population. © 2014 Wiley Periodicals, Inc.

Keywords: alcohol; heavy episodic drinking; SRE; college women; high-risk

Int J Eat Disord 2015; 48:333–336

Heavy episodic drinking (HED), defined by the consumption of four or more drinks at one time,¹ is a serious problem among college students^{2,3} and is increasingly prevalent among college women.³ Frequent heavy episodic drinkers have 13 times greater odds for abuse and 19 times greater odds for dependence.² HED is a common problem among women at high-risk for or with an ED.¹ Among college women at high-risk for EDs, 67% engaged in at least one and 30% experienced three or more HED episodes in the previous month.¹

The Self-Rating of the Effects of Alcohol (SRE) form⁴ measures response to alcohol as a risk for subsequent alcoholism. Offspring of alcoholics score higher on the SRE; higher scores significantly predict alcoholism years later and are associated with increased number of drinks consumed, alcohol-related problems, and alcohol dependence.^{4,5} To our knowledge, the SRE has never been evaluated in a college female population at risk for EDs.

A number of other factors influence drinking behaviors in college students. Drinking for coping reasons was the single best predictor of drinking levels 2 years later in college women.⁶ Women with moderate to high levels of stress show disproportionately greater substance use⁷ and may be prone to utilize drinking in response to psychosocial stressors. The presence of a relationship breakup has not been extensively examined in relation to alcohol abuse. From an interpersonal perspective, disruption of close relationships could lead to increased maladaptive behaviors. For example, women with binge eating disorder were significantly more likely to have experienced a relationship breakup within the year before ED onset.⁸ College students also show a

Accepted 19 October 2014

Supported by R01 MH081125 from NIMH, by T32 HL007456 from NHLBI, and by T32 MH019938 from NIMH.

*Correspondence to: Aimee Zhang, Department of Psychiatry, Stanford University Medical Center, Stanford, CA.
E-mail: aimeez@ucla.edu

¹ Department of Psychiatry, Stanford University Medical Center, Stanford, California

² Department of Psychology, University of California, Berkeley, Berkeley, California

³ Department of Psychology, Washington University in St. Louis, St. Louis, Missouri

⁴ Department of Psychiatry, Washington University School of Medicine in St. Louis, St. Louis, Missouri

Published online 31 October 2014 in Wiley Online Library (wileyonlinelibrary.com). DOI: 10.1002/eat.22365

© 2014 Wiley Periodicals, Inc.

significant increase in heavy drinking and substance use following a relationship breakup.⁹ Thus, in college women at high-risk for EDs, a population already vulnerable to mental and physical health issues,¹ it is important to determine whether relationship breakups predict HED, as this may inform novel targets for intervention.

This study aims to investigate whether the SRE predicts HED rates over time and examine the influence of relationship breakups on HED among college-aged women at high-risk for EDs.

Method

Data were collected on 206 college-aged (18–25 years) women from a randomized controlled trial evaluating an online ED prevention program.¹⁰ Participants were recruited from colleges and universities from Northern California and St. Louis, Missouri. Data from the 163 women who completed the 1-year follow-up assessment measuring HED were analyzed.

Participants were identified as high-risk for an ED by scoring ≥ 47 on the self-report Weight Concerns Scale (WCS)¹¹ and endorsing low-level compensatory behaviors, past or current depression, and/or being teased by a teacher, coach, or sibling.¹² Individuals with a clinical ED [based on the Eating Disorder Examination (EDE 14.0)¹³] were excluded.

The Institutional Review Boards at all sites approved the study. All participants provided informed consent.

Measures

Baseline measures included the Structured Clinical interview for DSM-IV (SCID)¹⁴ to assess alcohol use and dependence as well as history of traumatic events, the SRE, history of lifetime alcohol abuse or dependence, and number of HED episodes in the past month.¹⁰

The SRE assessed risk for alcohol dependence; individuals self-reported the number of drinks required to feel four possible effects of alcohol at three time points. The SRE has good test–retest reliability ($r = 0.81$), face validity, and construct validity.¹⁵

Approximately 12 months after baseline, participants completed a follow-up assessment using a structured timeline follow-back method in which behaviors were assessed for each month in the previous year.¹⁶ Participants reported relationship breakups (defined as a major falling-out with someone close, be it romantic partner, close friend, or someone else), HED, and the number of traumatic events in the past 12 months.

Approach to Statistical models

Generalized linear mixed-effect models (GLME)¹⁷ were used to examine the rate of change in HED over 1 year.

The GLME is a generalization of linear mixed-effect regression, a procedure that allows for examination of the correlational relationship between time-varying values on a variable of interest and increasing increments of time. Time is coded in consistent increments for each subject; in this study, there were 12 increments of one month each, coded 0–11. In a linear model, the time coefficient reflects the change in the level of the dependent variable per unit time. However, in the generalized form of the model, the dependent variable betrays important assumptions of normality, and a link function is required to link the true distribution to a normal distribution. In the case of count data—which are censored at zero and skewed—a log link is utilized, placing the outcome on a log scale. The regression coefficient thus represents the expected change in the log of the mean per month.

Taking the log transformation aside, results of the GLME regression models utilized here are the relative change in the number of HED episodes per month.

Results

Participants reported a mean age of 20.3 ($SD = 2.77$) years. The average BMI was 24.9 ($SD = 5.03$). Eighty participants (49%) identified themselves as Caucasian/White, 20 (12%) as African-American/Black, 15 (9%) as Mexican/Mexican-American, 35 (22%) as Asian/Asian-American, and 13 (8%) identified themselves by another racial/ethnic category or as multi-ethnic.

Alcohol Consumption and Breakup Rates

Over the 12-month period, 42 (25.8%) participants reported an increase in drinking behavior. An average of 8 ($SD = 2.8$) breakups each month was reported across all 163 participants.

Unconditional Growth Model

We first examined the change in number of HED episodes over the 12-month period. Random effects for intercept and slope were included in the model. An initial generalized linear model without nested random variation yielded an AIC value of 9,724. Inclusion of random (individual) variation at the intercept in a GLME yielded a substantially reduced AIC value of 5,364.7, indicating the presence of significant variance attributable to differences in initial level across participants. The random effect for slope was then added to the mixed-effect model, allowing a nested model comparison with the intercept-only model via a chi-square difference test. This test demonstrated that significant variance in the outcome was attributable to individual variation in slope [$\chi^2(2) = 209.43$, $p < .001$].

TABLE 1. Generalized linear mixed effect regression model with Poisson distribution for the effects of break-ups and additional covariates on reported HED behavior over 1 year

	Estimate	SE	z value	p value	d
Intercept	-1.838	0.317	-5.79	<.001	-
Time	-0.160	0.027	-5.92	<.001	-0.65
SRE score	0.314	0.088	3.56	<.001	0.39
Lifetime alcohol abuse	-0.071	0.558	-0.13	.90	-0.01
Lifetime alcohol dependence	-0.117	0.919	-0.13	.90	-0.01
#Drinks/Week	0.080	0.111	0.72	.47	0.08
#Days/Week alcohol use	0.165	0.214	0.77	.44	0.08
#HED last Month	0.115	0.095	1.22	.22	0.13
Traumatic life events	-0.126	0.141	-0.89	.37	-0.10
Breakup (0/1)	-0.246	0.144	-1.71	.09	-0.19
Time × SRE Score	0.017	0.006	2.68	.007	0.29
Time × alcohol abuse	-0.016	0.037	-0.42	.67	0.05
Time × alcohol dependence	0.089	0.058	1.53	.13	0.17
Time × #Drinks/Week	0.014	0.008	1.74	.08	0.19
Time × #Days/Week	0.017	0.015	1.12	.26	0.12
Time × #HED last month	-0.010	0.007	-1.42	.16	-0.16
Time × traumatic events	0.020	0.011	1.80	.07	0.20
Time × breakup	0.085	0.019	4.50	<.001	0.50

SRE = The Self-Rating of the Effects of Alcohol questionnaire; HED = heavy episodic drinking; *d* = Cohen's *d*, calculated by $t^* \sqrt{2/n}$.¹⁸

Thus, all models subsequently included random effects for intercept and slope. To test the unconditional growth of HED episodes, a fixed-effect for Time was then added to the model. The number of HED episodes significantly decreased over the 1-year period ($b = -0.049$, $SE = 0.013$, $z = -3.91$, $p < .001$).

Full Covariate Model

We examined the effect of breakups on drinking rates, while controlling for potentially important covariates: lifetime diagnosis of alcohol abuse, lifetime diagnosis of alcohol dependence, SRE scores, number of days reported drinking in the past week at baseline, number of HED episodes reported in the last month at baseline, and major traumatic life events over the course of the year (excluding breakups). Breakup was represented as a binary, presence versus absence, time-varying variable. Participants could report multiple breakups across the assessment period. **Table 1** presents these results. Change over time remained significant while controlling for all potential moderating variables, demonstrating a significant decrease in reported HED episodes over the assessment period. SRE was the only significant main effect, predicting greater reported HED episodes at baseline. Additionally, only SRE and the presence of a breakup significantly moderated change in drinking behavior over time: both predicted increased incidence of HED and remained significant predictors after controlling for age and ethnicity.¹⁸

Discussion

SRE scores at baseline and relationship breakups predicted HED. Furthermore, SRE score was significantly associated with increased HED over time, even after controlling for potential moderating variables.

To our knowledge, this is the first study to investigate the SRE in a high-risk ED sample. In addition to predicting HED, SRE scores are highly correlated among family members and can identify individuals at genetic risk for developing alcoholism.⁹ Although the link between alcoholism and EDs remains unclear, it is possible that individuals with a genetic predisposition for alcoholism are also genetically predisposed to develop EDs.^{19,20} One limitation of the study is that the SRE has been validated in men¹⁵ but not in the current population.

Another variable that has not been studied in relationship to alcohol behaviors and EDs is the presence of a breakup. In addition to stressors that participants in this specific population experience, including academic stress and high weight and shape concerns, relationship breakups may be a significant stressor that increases HED in a vulnerable population.¹ However, since the presence of a breakup no longer predicted HED after adjusting for SRE, further research is needed to establish whether there is a relationship between the two variables. The small sample size could have contributed to the lack of a significant interaction.

Future studies could collect long-term follow-up data to ascertain whether SRE scores predict alcoholism in college women at high-risk for EDs. Findings from the current study could help identify individuals at high-risk for both EDs and alcoholism, and inform intervention to reduce and prevent HED in this population.

References

1. Khaylis A, Trockel M, Taylor CB. Binge drinking in women at risk for developing eating disorders. *Int J Eat Disord* 2009;42:409–414.
2. Knight JR, Wechsler H, Kuo M, Seibring M, Weitzman ER, Schuckit MA. Alcohol abuse and dependence among U.S. college students. *J Stud Alcohol* 2002;63:263–270.
3. Young AM, Morales M, McCabe SE, Boyd CJ, D'Arcy H. Drinking like a guy: Frequent binge drinking among undergraduate women. *Subst Use Misuse* 2005;40:241–267.
4. Schuckit MA, Smith TL, Tipp JE. The self-rating of the effects of alcohol (SRE) form as a retrospective measure of the risk for alcoholism. *Addict* 1997;92:979–988.
5. Schuckit MA, Smith, TL, Danko GP, Pierson J, Hesselbrock V, Bucholz KK, et al. The ability of the Self-Rating of the Effects of Alcohol (SRE) Scale to predict alcohol-related outcomes five years later. *J Stud Alcohol Drugs Suppl* 2007;68:371–378.

6. Schall M, Weede TJ, Maltzman I. Predictors of alcohol consumption by university students. *J Alcohol Drug Educ* 1991;37:72–80.
7. O'hare T, Sherrer MV. Co-occurring stress and substance abuse in college first offenders. *J Hum Behav Soc Environ* 2000;3:29–44.
8. Pike KM, Wilfley D, Hilbert A, Fairburn CG, Dohm FA, Striegel-Moore RH. Antecedent life events of binge-eating disorder. *Psychiatry Res* 2006;142:19–29.
9. Fleming CB, White HR, Oesterle S, Haggerty KP, Catalano RF. Romantic relationship status changes and substance use among 18-to 20-year-olds. *J Stud Alcohol Drugs* 2010;71:847–856.
10. Vannucci A, Kass AE, Sinton MM, Aspen V, Weisman H, Bailey JO, et al. An examination of the clinical impairment assessment among women at high risk for eating disorder onset. *Behav Res Ther* 2012;50:407–414.
11. Killen JD, Taylor CB, Hayward C, Haydel KF, Wilson DM, Hammer L, et al. Weight concerns influence the development of eating disorders: A 4-year prospective study. *J Consult Clin Psychol* 1996;64:936–940.
12. Jacobi C, Fittig E, Bryson S, Wilfley D, Kraemer H, Taylor CB. Who is really at risk? Identifying risk factors for subthreshold and full syndrome eating disorders in a high-risk sample. *Psychol Med* 2011;41:1939–1949.
13. Fairburn CG, Cooper Z. The eating disorders examination, 12th ed. In: Fairburn CG, Wilson GT, editors. *Binge Eating: Nature, Assessment, and Treatment*. New York: The Guilford Press, 1993, pp. 317–331.
14. First MB, Spitzer RL, Gibbon M, Williams JBW. *Structured Clinical Interview For DSM-IV-TR Axis I Disorders, Research version*. New York: Biometrics Research, New York State Psychiatric Institute, 2002.
15. Schuckit MA, Tipp JE, Smith TL, Wiesbeck GA, Kalmijn J. The relationship between Self-Rating of the Effects of alcohol and alcohol challenge results in ninety-eight young men. *J Stud Alcohol Drugs* 1997;58:397–404.
16. Taylor CB, Bryson S, Luce KH, Cunniff D, Doyle AC, Abascal LB, et al. Prevention of eating disorders in at-risk college-age women. *Arch Gen Psychiatry* 2006;63:881–888.
17. Bolker BM, Brooks ME, Clark CJ, Geange SW, Poulsen JR, Stevens MHH, et al. Generalized linear mixed models: A practical guide for ecology and evolution. *Trends Ecol Evol* 2009;24:127–135.
18. Dunlap WP, Cortina JM, Vaslow JB, Burke MJ. Meta-analysis of experiments with matched groups or repeated measures designs. *Psychol Methods* 1996; 1:170–177.
19. Baker JH, Mitchell KS, Neale MC, Kendler KS. Eating disorder symptomatology and substance use disorders: Prevalence and shared risk in a population based twin sample. *Int J Eat Disord* 2010;43:648–658.
20. Baker JH, Munn-Chernoff MA. Genetic Vulnerability to Eating Disorders and Substance Use Disorders. In: Brewerton TD, Dennis AB, editors. *Eating Disorders, Addictions and Substance Use Disorders*. Berlin Heidelberg: Springer, 2014, pp. 91–106.