Addictive Behaviors 36 (2011) 241–243

Contents lists available at ScienceDirect

Addictive Behaviors

Short Communication

Self-Rating of the Effects of Alcohol (SRE): Predictive utility and reliability across interview and self-report administrations

Lara A. Ray *, Eliza J. Hart, Pauline F. Chin

University of California, Los Angeles, Department of Psychology, Los Angeles, CA 90095, United States

ARTICLE INFO

Keywords:
SRE
Level of response to alcohol
Alcohol problems
Assessment
Reliability

ABSTRACT

The Self-Rating of the Effects of Alcohol (SRE) is a widely used and well-established measure of the level of response to alcohol. Although the SRE has been successfully used in studies of alcoholism etiology, including genetics, studies to date have not compared the self-report and interview formats. The objectives of this study are to: (a) test the predictive utility of the subscales of the SRE in relation to alcohol problems; and (b) test the reliability of the SRE in interview versus self-report formats. A sample of college drinkers ($n=446$) completed the SRE in a self-report format along with the Alcohol Use Disorders Identification Test (AUDIT). A subset of participants ($n=34$) returned to the laboratory and completed the SRE in a face-to-face interview format. All subscales of the SRE were robust predictors of alcohol problems accounting for as much as 25% of the variance in AUDIT scores. In addition, scores obtained via self-report and interview-based SRE were highly correlated ($r=.70$ to .80). Results support the predictive utility of the SRE and provide initial evidence that the self-report and interview formats produce reliable results and may be combined and/or used interchangeably.

1. Introduction

Low level of response to alcohol (LR), defined as requiring a higher number of standard drinks to reach behavioral markers of alcohol intoxication, has emerged as a well-established biobehavioral marker of risk for alcoholism (Schuckit & Smith, 1996, 2006). Genetic studies have found that LR is a heritable phenotype (Viken, Rose, Morzorati, Christian, & Li, 2003) and may be explained by genes underlying γ-aminobutric acid (GABA) neurotransmission (Dick et al., 2006; Enoch, 2008; Schuckit, Smith, & Kalmijn, 2004). Traditionally, LR has been measured using alcohol administration paradigms (Schuckit & Gold, 1988; Schuckit, Tsuang, Anthenelli, Tipp, & Nurnberger, 1996). However, given the limitations to alcohol challenges, including high costs, time-consuming nature, and inability to conduct alcohol challenges with underage individuals, the Self-Rating of the Effects of Alcohol (SRE) measure has emerged as an alternative to assessing LR (Schuckit, Smith, & Tipp, 1997; Schuckit, Tipp, Smith, Wiesbeck, & Kalmijn, 1997). Research suggests that the SRE is a valid and reliable measure of subjective responses to alcohol when compared to alcohol challenges (Schuckit, Smith, Trim, Fukukura, & Allen, 2009; Schuckit, Tipp et al., 1997). A study examining the test–retest reliability of the SRE in non-dependent, young adult men reported reliability of 0.82 over a 1-year period (Schuckit, Tipp et al., 1997). This same study evaluated the correlation between the SRE and LR as evidenced by a low overall score on the Subjective High Assessment Scale (SHAS) during an alcohol challenge. Correlations between the SRE and SHAS at 30 min and 60 min were −0.35 and −0.36, respectively, demonstrating that the SRE is a valid measure of LR to alcohol with higher total SRE scores correlating with lower SHAS scores (Schuckit, Tipp et al., 1997).

The predictive utility of the SRE has proven to be robust, regardless of age of the research sample. Longitudinal studies that followed adolescent and adult drinkers and a study directly comparing 12-year old and 35-year old drinkers both report a significant correlation between baseline SRE-reported low LR and age-appropriate alcohol problems several years later, regardless of age group (Schuckit et al., 2006; Schuckit et al., 2007; Schuckit et al., 2008b). The SRE appears to be highly informative, both retrospectively as a means to elucidate the phenotypic indicators of current alcohol problems, as well as a predictive means of early identification of those at future risk, who may benefit from preventative approaches.

Simultaneous testing of the predictive utility of the SRE and alcohol challenges found additional support for the interchangeable use of these assessment methods (Schuckit et al., 2009). The predictive utility of alcohol challenges regarding future heavy drinking overlapped with SRE-based predictions by up to 60% (Schuckit et al., 2009). Importantly, the SRE has proven useful and reliable amongst various populations, predicting future alcohol problems and heavy drinking in 12- and 13-year olds (Schuckit et al., 2005; Schuckit et al., 2008b), African–Americans (Pedersen & McCarthy, 2009), middle-aged women (Schuckit, Smith, Danko, &

* Corresponding author. Department of Psychology, University of California, Los Angeles, Box 951563, Los Angeles, CA 90095-1563, United States. Tel.: +1 310 794 5383; fax: +1 310 207 5895.
E-mail address: lararay@psych.ucla.edu (L.A. Ray).

0306-4603/$ – see front matter © 2010 Elsevier Ltd. All rights reserved.
doi:10.1016/j.addbeh.2010.10.009

Isacescu, 2003) and young adult men (Schuckit, Tipp et al., 1997). The predictive utility of the SRE is unique in capturing early LR at onset of drinking in underage adolescent drinkers, who would otherwise be excluded from alcohol challenges (Schuckit et al., 2008a; Schuckit, Smith, Trim, Kreikebaum et al., 2008; Schuckit et al., 2008b). Administration of the SRE at onset of drinking in 12-year olds provided more robust predictions of alcohol problems than similar analyses in their fathers, who underwent alcohol challenges in an earlier study (Schuckit, Smith, Anderson, & Brown, 2004; Schuckit, Smith, Trim, Kreikebaum et al., 2008). This suggests that SRE-based LR at onset of drinking may be more informative in prediction of future risk than measuring LR in adults who have longer drinking histories.

Despite extensive research on the psychometrics and predictive utility of the SRE, there are no published reports of the reliability across administration methods. Few studies have examined the predictive utility of the SRE in college samples, which may have important implications for the prevention of alcohol use disorders in youth. Hence, the objectives of the present study are to: (a) test the predictive utility of the SRE in relation to alcohol problems in a large sample of college drinkers; and (b) test the reliability of the SRE in interview versus self-report administration formats.

2. Method

2.1. Participants and procedures

Participants were undergraduate college students recruited from the University of California, Los Angeles ($n=446$, average age = 19.40, 66.4% female). The ethnic representation was as follows: Caucasian (38.3%), Asian (29.4%), Latino (14.1%), African–American (2.2%), Pacific Islander (1.6%), Biracial (7.9%), or Other (6.5%). From this larger sample, a subset of 34 individuals completed a face-to-face interview in our laboratory (53% female, average age = 20.03). Both arms of the study (self-report and interview) were approved by the Human Research Committee at the University of California Los Angeles, and all participants provided written informed consent after receiving a full explanation of the study at each assessment point.

Participants ($n=446$) completed the self-report portion of the study in the context of their research participation for the Introductory Psychology course. A subset of individuals who had completed the SRE in a self-report format was invited via email to complete the face-to-face arm of the study. Individuals with more drinking experiences reported in the SRE were prioritized in order to more fully evaluate reliability across multiple SRE items. Participants ($n=34$) were the first to respond to the email invitation. They came to the laboratory, provided written informed consent, and completed the face-to-face interview. Laboratory visits occurred within two months of self-report data collection. Participants received course credit for completion of the study.

2.2. Measures

All participants reported gender, age, ethnicity, household income and years of education. The following measures of alcohol use and problems were administered.

2.2.1. Alcohol problems

Participants reported alcohol problems by completing the Alcohol Use Disorders Identification Test (AUDIT) (Allen, Litten, Fertig, & Babor, 1997), a 10-item measure developed by the World Health Organization to screen for and quantify hazardous drinking. A score of 8 or higher on the AUDIT indicates at-risk drinking.

2.2.2. Level of response to alcohol

The Self-Rating of the Effects of Alcohol (SRE) is a retrospective measure of LR to alcohol and asks participants to report the number of standard drinks (10–12 g of ethanol) required to experience the following behavioral effects of intoxication: "begin to feel different," "feel a bit dizzy or begin to slur your speech," "begin stumbling, or walking in an uncoordinated manner," and "pass out, or fall asleep when you did not want to" (Schuckit, Smith et al., 1997). Standard drink estimates were obtained for the first 5 drinking episodes (SRE-5), first 3 months of regular drinking (defined as drinking at least once per month; SRE-3), and period of heaviest drinking (SRE-H). As recommended by Schuckitet al. (1997), a total score was also computed (SRE-T). Summary scores for each SRE subscale were calculated by dividing the sum of standard drinks across the four behavioral effects by the number of effects endorsed (Schuckit et al., 2009). SRE average scores are reported in Table 1 and are consistent with a previous report on a sample of young and non-dependent drinkers (Schuckit, Tipp, et al., 1997).

3. Results

3.1. Predictive utility of the SRE in self-report sample ($n=446$)

Linear regression analyses tested the predictive utility of the SRE subscales (SRE-5, SRE-3, SRE-H, and SRE-T) in relation to alcohol problems, measured by the AUDIT. The average AUDIT score was 7.29 ($SD=5.01$; Range = 0–33). Ethnicity was not associated with SRE scores ($p>.40$) and therefore not controlled for in subsequent analyses. Gender was controlled for in all models and age was a covariate in the model for SRE-5, as age was negatively associated only with SRE-5 scores ($r=-.11$, $p<.05$) and gender was associated with SRE scores at all subscales, such that males reported a higher number of drinks to reach behavioral markers ($r=-.32$ to $-.36$). Average scores on each SRE item and subscale are presented in Table 1.

Results revealed that the SRE-5 score was a significant predictor of AUDIT scores ($\beta=0.72$, $p<.0001$, $R^2=.07$), controlling for gender ($\beta=-1.16$, $p<.05$, $R^2=.01$), and age ($\beta=-0.25$, $p<.05$, $R^2=.01$). The SRE-3 score was a significant predictor of the AUDIT score ($\beta=0.86$, $p<.0001$, $R^2=.12$), after controlling for gender ($\beta=-0.79$, $p=.12$, $R^2=.006$). SRE-H significantly predicted AUDIT scores ($\beta=1.03$, $p<.0001$, $R^2=.25$), controlling for gender ($\beta=-0.45$, $p=.37$, $R^2=.002$). The same pattern was found for SRE-T ($\beta=1.08$, $p<.0001$, $R^2=.22$), controlling for gender ($\beta=-0.61$, $p=.19$, $R^2=.004$). In summary, results indicated that each subscale of the SRE individually predicted alcohol problems and accounted for a large proportion of the variance in AUDIT scores (R^2 range = .12 to .25) and that SRE-H was the strongest predictor of alcohol problems, accounting for 25% of the variance in AUDIT scores.

Table 1
Average SRE single item and subscale scores.

	N	Mean (SD)	Range
First 5 times			
Any effect	446	2.59 (1.43)	1–12
Dizzy/slurred speech	423	4.03 (1.83)	1–15
Stumbling	364	5.35 (2.33)	1–17
Pass out	216	7.32 (3.06)	2–21
SRE-5 subscale score	446	4.23 (1.93)	1–14
Recent 3 months			
Any effect	394	3.25 (1.57)	1–12
Dizzy/slurred speech	379	4.80 (1.98)	1–15
Stumbling	344	6.10 (2.35)	1–16
Pass out	202	8.08 (2.94)	3–20
SRE-3 subscale score	394	5.02 (2.03)	1–15
Heaviest drinking			
Any effect	360	4.01 (2.05)	1–18
Dizzy/slurred speech	349	5.67 (2.52)	1–18
Stumbling	326	7.10 (2.75)	2–19
Pass out	217	9.46 (3.75)	3–28
SRE-H subscale score	360	6.06 (2.58)	1–18
SRE-total score	446	4.52 (2.22)	1–15

3.2. Reliability across self-report and interview-based administrations ($n = 34$)

To estimate the reliability of the SRE scores obtained using self-report and interview methods, Pearson Product Moment correlations were computed using the subsample of 34 individuals who completed the SRE in both administration formats. Results revealed that the correlation between self-report and interview scores for the SRE-5, SRE-3, SRE-H, and SRE-T were $r = .70$, .74, .80, and .71, respectively. These results provide initial evidence that the SRE yields comparable results using both administration formats and that the two may be used interchangeably.

4. Discussion

Analysis of the predictive utility of the SRE revealed that each subscale was a robust predictor of AUDIT scores, such that individuals who were low responders to alcohol reported more alcohol-related problems and hazardous drinking. Specifically, LR to alcohol assessed for the period of heaviest drinking (SRE-H) accounted for 25% of the variance in AUDIT scores, even after controlling for gender. These results are consistent with longitudinal findings employing the SRE (Schuckit, Smith, Trim, Kreikebaum et al., 2008), studies of younger samples (Schuckit et al., 2008a, b), and middle-aged women (Schuckit et al., 2003). This suggests that SRE-reported LR to alcohol, particularly during the heaviest drinking period (SRE-H), may be useful for early detection of hazardous college drinkers. The fact that heaviest drinking period was most predictive of alcohol problems may also reflect the developmental nature of the sample, as many of the participants were experiencing the transition to college and a consequent increase in alcohol use (Jackson, Sher, & Park, 2005; Sher & Rutledge, 2007), such that a large portion of this college sample may be currently experiencing their heaviest drinking period.

This study also compared SRE scores obtained via two distinct administration formats, self-report and face-to-face interviews. Comparisons of the two formats indicated a moderate-to-high degree of reliability between the results obtained using both methods. This is important for both empirical and practical reasons, since self-report and interview-based data may be combined and self-report data collection represents a viable approach that enhances study feasibility and facilitates data collection when studying LR to alcohol in large samples, which is often required for the purpose of genetic analysis, particularly genome-wide approaches (Bilder et al., 2009).

Study strengths include a large sample size and multi-method SRE administration. Limitations include the college-based nature of the sample, which may not generalize to community-based samples, and the smaller sample size of 34 individuals who had completed both administrative formats of the SRE. This may be important when considering that the correspondence between self-report and interview-based SRE scores hinges upon participants' ability to accurately understand the instructions, which may differ as a function of education. Limitations notwithstanding, the present study extends the literature on the SRE, a well-established measure of LR to alcohol, which is in turn, a risk factor for the development of alcohol use disorders. In conclusion, the present findings support the predictive utility of the SRE among college drinkers, particularly the SRE-H subscale and indicate that the self-report and interview-based administrations of the SRE produce highly comparable results. Further studies extending these results to community-based samples are warranted.

Role of Funding Source

This study was supported by seed funds from the Department of Psychology, at the University of California Los Angeles (UCLA) to Dr. Lara Ray. The funding source did not have any role in study design, data collection and analysis, interpretation of data, or report writing.

Contributors

Dr. Ray designed the study and conducted the statistical analyses. Pauline Chin and Eliza Hart contributed to data collection, data entry, and wrote sections of the manuscript. All authors contributed to manuscript revisions during peer review. All authors contributed to and have approved the final manuscript.

Conflict of Interest

None.

Acknowledgements

The authors would like to thank Katy Lunny, Nicole Feeling, and Spencer Bujarksi for their contribution to data collection and data management of this project.

References

Allen, J. P., Litten, R. Z., Fertig, J. B., & Babor, T. (1997). A review of research on the Alcohol Use Disorders Identification Test (AUDIT). *Alcoholism, Clinical and Experimental Research*, *21*(4), 613–619.

Bilder, R. M., Sabb, F. W., Cannon, T. D., London, E. D., Jentsch, J. D., Parker, D. S., et al. (2009). Phenomics: the systematic study of phenotypes on a genome-wide scale. *Neuroscience*, *164*(1), 30–42.

Dick, D. M., Plunkett, J., Wetherill, L. F., Xuei, X., Goate, A., Hesselbrock, V., et al. (2006). Association between GABRA1 and drinking behaviors in the collaborative study on the genetics of alcoholism sample. *Alcoholism, Clinical and Experimental Research*, *30*(7), 1101–1110.

Enoch, M. A. (2008). The role of GABA(A) receptors in the development of alcoholism. *Pharmacology, Biochemistry and Behavior*, *90*(1), 95–104.

Jackson, K. M., Sher, K. J., & Park, A. (2005). Drinking among college students. Consumption and consequences. *Recent Developments in Alcoholism*, *17*, 85–117.

Pedersen, S. L., & McCarthy, D. M. (2009). An examination of subjective response to alcohol in African Americans. *Journal of Studies on Alcohol and Drugs*, *70*(2), 288–295.

Schuckit, M. A., & Gold, E. O. (1988). A simultaneous evaluation of multiple markers of ethanol/placebo challenges in sons of alcoholics and controls. *Archives of General Psychiatry*, *45*(3), 211–216.

Schuckit, M. A., & Smith, T. L. (1996). An 8-year follow-up of 450 sons of alcoholic and control subjects. *Archives of General Psychiatry*, *53*(3), 202–210.

Schuckit, M. A., & Smith, T. L. (2006). An evaluation of the level of response to alcohol, externalizing symptoms, and depressive symptoms as predictors of alcoholism. *Journal of Studies on Alcohol*, *67*(2), 215–227.

Schuckit, M. A., Smith, T. L., Anderson, K. G., & Brown, S. A. (2004). Testing the level of response to alcohol: social information processing model of alcoholism risk—a 20-year prospective study. *Alcoholism, Clinical and Experimental Research*, *28*(12), 1881–1889.

Schuckit, M. A., Smith, T. L., Beltran, I., Waylen, A., Horwood, J., & Davis, J. M. (2005). Performance of a self-report measure of the level of response to alcohol in 12- to 13-year-old adolescents. *Journal of Studies on Alcohol*, *66*(4), 452–458.

Schuckit, M. A., Smith, T. L., Danko, G. P., & Isacescu, V. (2003). Level of response to alcohol measured on the self-rating of the effects of alcohol questionnaire in a group of 40-year-old women. *The American Journal of Drug and Alcohol Abuse*, *29*(1), 191–201.

Schuckit, M. A., Smith, T. L., Danko, G. P., Pierson, J., Hesselbrock, V., Bucholz, K. K., et al. (2007). The ability of the Self-Rating of the Effects of Alcohol (SRE) Scale to predict alcohol-related outcomes five years later. *Journal of Studies on Alcohol and Drugs*, *68*(3), 371–378.

Schuckit, M. A., Smith, T. L., & Kalmijn, J. (2004). The search for genes contributing to the low level of response to alcohol: patterns of findings across studies. *Alcoholism, Clinical and Experimental Research*, *28*(10), 1449–1458.

Schuckit, M. A., Smith, T. L., & Tipp, J. E. (1997). The Self-Rating of the Effects of alcohol (SRE) form as a retrospective measure of the risk for alcoholism. *Addiction*, *92*(8), 979–988.

Schuckit, M. A., Smith, T. L., Trim, R., Fukukura, T., & Allen, R. (2009). The overlap in predicting alcohol outcome for two measures of the level of response to alcohol. *Alcoholism, Clinical and Experimental Research*, *33*(3), 563–569.

Schuckit, M. A., Smith, T. L., Trim, R., Heron, J., Horwood, J., Davis, J. M., et al. (2008a). The performance of elements of a 'level of response to alcohol'-based model of drinking behaviors in 13-year-olds. *Addiction*, *103*(11), 1786–1792.

Schuckit, M. A., Smith, T. L., Trim, R. S., Heron, J., Horwood, J., Davis, J., et al. (2008b). The self-rating of the effects of alcohol questionnaire as a predictor of alcohol-related outcomes in 12-year-old subjects. *Alcohol and Alcoholism*, *43*(6), 641–646.

Schuckit, M. A., Smith, T. L., Trim, R., Kreikebaum, S., Hinga, B., & Allen, R. (2008c). Testing the level of response to alcohol-based model of heavy drinking and alcohol problems in offspring from the San Diego Prospective Study. *Journal of Studies on Alcohol and Drugs*, *69*(4), 571–579.

Schuckit, M. A., Smith, T. L., Waylen, A., Horwood, J., Danko, G. P., Hibbeln, J. R., et al. (2006). An evaluation of the performance of the self-rating of the effects of alcohol questionnaire in 12- and 35-year-old subjects. *Journal of Studies on Alcohol*, *67*(6), 841–850.

Schuckit, M. A., Tipp, J. E., Smith, T. L., Wiesbeck, G. A., & Kalmijn, J. (1997). The relationship between Self-Rating of the Effects of alcohol and alcohol challenge results in ninety-eight young men. *Journal of Studies on Alcohol*, *58*(4), 397–404.

Schuckit, M. A., Tsuang, J. W., Anthenelli, R. M., Tipp, J. E., & Nurnberger, J. I., Jr. (1996). Alcohol challenges in young men from alcoholic pedigrees and control families: a report from the COGA project. *Journal of Studies on Alcohol*, *57*(4), 368–377.

Sher, K. J., & Rutledge, P. C. (2007). Heavy drinking across the transition to college: predicting first-semester heavy drinking from precollege variables. *Addictive Behaviors*, *32*(4), 819–835.

Viken, R. J., Rose, R. J., Morzorati, S. L., Christian, J. C., & Li, T. K. (2003). Subjective intoxication in response to alcohol challenge: heritability and covariation with personality, breath alcohol level, and drinking history. *Alcoholism, Clinical and Experimental Research*, *27*(5), 795–803.