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BRIEF REPORT

Activity Enjoyment, Not Frequency, Is Associated With Alcohol-Related Problems and Heavy Episodic Drinking

Jessica F. Magidson
Massachusetts General Hospital, Boston, MA and Harvard Medical School

Briana L. Robustelli
University of Colorado Boulder

C. J. Seitz-Brown
University of Maryland, College Park

Mark A. Whisman
University of Colorado Boulder

Depression and alcohol use disorder (AUD) commonly co-occur, and this comorbidity is associated with greater impairment and higher likelihood of relapse compared to either disorder alone. Identifying shared vulnerability across depression and AUD may aid in developing more parsimonious treatment approaches. Low levels of positive reinforcement for healthy behaviors have been implicated as a shared vulnerability across both depression and AUD. However, prior research in this area has largely been conducted among college students and has rarely examined depression and AUD symptoms together. This study aims to extend prior literature by examining the association between both the frequency and enjoyment of activities and AUD symptoms in a national sample of adults (n = 609) while also accounting for depressive symptoms. Study results indicated that low levels of enjoyment were associated with greater alcohol-related problems and frequency of heavy episodic drinking, above and beyond depressive symptoms. The frequency of potentially pleasurable activities was unrelated to alcohol-related problems or heavy episodic drinking. Findings extend prior literature by providing evidence for the association between enjoyment of activities and alcohol use, above and beyond depressive symptoms, among a national sample of adults. These results suggest that prioritizing enjoyment of activities, rather than frequency, may be important for behavioral intervention efforts to address heavy drinking and associated problems. Future longitudinal research using observational methods of behavior is needed to identify causal relationships between activity enjoyment and AUD symptoms.

Keywords: alcohol-related problems, heavy drinking, depression, behavioral theory

Depression and alcohol use disorder (AUD) commonly co-occur (Grant et al., 2004). Depression and AUD comorbidity are associated with greater impairment, symptom severity, and likelihood of relapse than either disorder alone (Conner, Pinquart, & Gamble, 2009). Identifying shared vulnerability factors across depression and AUD may aid in developing more parsimonious treatment approaches to address this comorbidity.

Longstanding reinforcement theories of depression (Lewinsohn, 1974) posit that depression develops and is maintained through reduced response-contingent positive reinforcement,

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Jessica F. Magidson, Department of Psychiatry, Massachusetts General Hospital, Boston, MA and Department of Psychiatry, Harvard Medical School; Briana L. Robustelli, Department of Psychology and Neuroscience, University of Colorado Boulder; C. J. Seitz-Brown, Department of Psychology, University of Maryland, College Park; Mark A. Whisman, Department of Psychology and Neuroscience, University of Colorado Boulder.

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The specific ideas and analyses presented in the article have not been disseminated previously.

Correspondence concerning this article should be addressed to Jessica F. Magidson, Department of Psychiatry, Massachusetts General Hospital, Boston, MA and Harvard Medical School, 1 Bowdoin Square, 7th Floor, Boston, MA 02108. E-mail: Jmagidson@mgh.harvard.edu

either through reduced engagement in rewarding activities and/or a lack of perceived pleasure from these activities (Lewinsohn & Graf, 1973). Similarly, behavioral economic models of substance use suggest that contributing factors in the development and maintenance of AUDs include low levels of engagement in substance-free, rewarding activities[1] and lack of reward derived from these substance-free activities. Early human and animal research has identified that lower availability of alternative reinforcers, constraints on accessing available alternative reinforcers, and minimal constraints on alcohol are all associated with likelihood of alcohol consumption (Vuchinich & Tucker, 1988).

More recent empirical data, largely among college students, have supported the link between alcohol use and alternative healthy, rewarding behaviors. College students who reported heavy drinking in the past 30 days reported lower participation in substance-free activities compared to non-heavy drinking peers and reported less pleasure from these activities when they did occur (Correia, Carey, Simons, & Borsari, 2003). Decreases in substance-free positive reinforcement inversely predicted increases in substance use behavior in college students, even after controlling for reward derived from substance use (Correia, Simons, Carey, & Borsari, 1998). Deriving a greater amount of reward from substance-free activities was also associated with lower likelihood of 6-month alcohol relapse following a brief AUD intervention (Murphy, Correia, Colby, & Vuchinich, 2005). Yet, this research has largely been conducted among college students and has focused exclusively on alcohol without also accounting for depression. Given the prevalence of depression-AUD comorbidity and the relevance of reinforcement theories across these disorders, it is important to consider depressive symptoms in the relationships between activity engagement, enjoyment, and AUD symptoms.

The aims of the current study were to extend prior literature by (a) testing the association between both the *frequency* of engaging in potentially rewarding activities and *enjoyment* from these activities with AUD symptoms (alcohol-related problems and heavy episodic drinking) in a national sample of adults; and (b) testing this association after accounting for depressive symptoms. Additionally, given prior research suggesting the moderating role of gender in the relationship between positive reinforcement and alcohol use (Murphy, Barnett, Goldstein, & Colby, 2007), we also examined the moderating role of gender in these associations.

Method

Participants

Data for the study were collected as part of the National Survey of Midlife Development in the United States (MIDUS), conducted by the John D. and Catherine T. MacArthur Foundation network on Successful Midlife Development. The present analyses are based on the random-digit dialing sample of MIDUS, which is a national sample of noninstitutionalized, English-speaking adults 25–74 years old. A 10-year follow-up study was conducted on the original sample in 2004–2006 (the MIDUS II); self-administered questionnaire data, including the data examined in this study, were collected on a subsample of MIDUS II respondents (Ryff, Seeman, & Weinstein, 2010). The final sample included 609 individuals.

Measures

Alcohol-related problems. Alcohol-related problems during the past 12 months were measured with the Alcohol Dependence (AD) scale of the Composite International Diagnostic Interview (CIDI) Short Form (CIDI-SF; Kessler, Andrews, Mroczek, Ustun, & Wittchen, 1998), which is a fully structured scale developed from item-level analyses of the CIDI designed to classify AUD diagnosis. A comparison of the CIDI-SF classifications of AD with the full CIDI yielded a sensitivity of 93.6%, a specificity of 96.2%, and an overall agreement of 95.8% (Kessler et al., 1998). The scale consists of seven items, six of which were included in the MIDUS II; use in hazardous situations was not included. Four items were assessed dichotomously (0 = no, 1 = yes), including emotional or psychological problems as a result of use, strong desire or urge to drink, spending a great deal of time using or recovering, and drinking more to get the same effect. Two additional questions—role interference as a result of use and drinking more or using longer than intended—were rated on a 6-point scale (1 = *never* to 6 = *more than 20 times*), which was dichotomized (0 = never, 1 = all other responses), consistent with the original scoring. An alcohol dependence score (range: 0–6) was computed based on the number of positive responses to the symptom questions.

Heavy episodic drinking. Heavy episodic drinking was assessed with a single question: "Considering all types of alcoholic beverages, how many times during the past month did you have five or more drinks on the same occasion?" with *occasion* being defined in terms of drinks in a row or in a short period of time. Responses greater than three were recoded as three, due to the small number of people who reported more than three episodes of heavy drinking in the past month.

Frequency and enjoyment of activities. Frequency and enjoyment of activities in one's environment was measured using the Pleasant Events Schedule (PES; MacPhillamy & Lewinsohn, 1982). The PES is a self-report measure of the experience of commonly rewarding events. Items are rated first on a 3-point *frequency* scale during the past month (0 = *did not happen,* 1 = *happened a few times,* 2 = *happened often*) and on a 3-point *enjoyment* scale (0 = *not pleasant,* 1 = *somewhat pleasant,* 2 = *very pleasant*). MIDUS II included a modified version of the Mood Related (MR) subscale of the original 320-item PES (Lewinsohn & Amenson, 1978; MacPhillamy & Lewinsohn, 1982). The MR subscale consists of 49 PES items that were significantly correlated with reported mood during mood and activity self-monitoring in a previous study (Lewinsohn & Graf, 1973). Sample items included "Reading stories, novels, poems, or plays" and "Seeing beautiful scenery." Frequency and enjoyment scales are created by computing the mean of the items (scales have a range of 0–2). Higher scores reflect more frequent participation in potentially rewarding activities and greater enjoyment derived from these activities, respectively. An *obtained pleasure* score is created by multiplying each item's frequency score by its enjoyment score and computing the mean (scale has a range of 0–4). *Obtained*

[1] We refer to alternative "substance-free activities" throughout the article, which we define as events or activities that are not associated with direct use of drugs or alcohol, are not tied to experiencing the effects of substances, do not directly induce cravings to use substances, and are otherwise generally viewed as incompatible with substance use.

pleasure is an approximate measure of response-contingent positive reinforcement (Lewinsohn & Amenson, 1978; MacPhillamy & Lewinsohn, 1982). In the current sample, there was good internal consistency for frequency ($\alpha = .89$), enjoyment ($\alpha = .90$), and obtained pleasure ($\alpha = .91$) scales.[2]

Depressive symptoms. Depressive symptoms were measured with the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977), which is a 20-item measure developed for use in community samples. Items are rated on a 4-point scale for the frequency of occurrence during the past week, and a summary score was computed by reverse scoring the positive items and computing the sum of the items, with higher scores indicating greater depression severity. A score ≥16 indicates clinically elevated depressive symptoms. The CES-D demonstrated good internal consistency in this sample ($\alpha = .89$).

Results

Post-stratification sample weights were used in all analyses to adjust sample data to better conform to population parameters. After weighting, the study sample ($n = 609$) was 55% women, 92.2% White, 3.6% Black, 1.0% Native American or Alaska Native, and 3.2% other. Mean age was 54.1 years ($SD = 11.8$). Two thirds of the sample (68.2%) was married, 15.4% was separated or divorced, 1.9% was cohabiting, 6.5% was widowed, and 8.1% had never been married. Descriptive information for the study measures is presented in Table 1. Approximately 23% of the sample reported at least one alcohol-related problem, 13.9% reported at least one episode of heavy drinking in the past month, and 14.7% scored ≥16 on the CES-D. Means obtained on the PES were comparable to normative data (MacPhillamy & Lewinsohn, 1982).

Because statistical interactions qualify the interpretation of a main effect, we followed Aiken and West's (1991) recommended top-down approach for testing moderation and first evaluated whether the associations between PES scales and both alcohol-related problems and heavy episodic drinking were moderated by gender. To test for gender moderation, we conducted a series of linear regression analyses. In these analyses, the number of alcohol-related problems or the occurrence of heavy episodic drinking was regressed on gender, PES, and the Gender × PES interaction term; the PES terms were mean deviated (i.e., centered) prior to creating the interaction terms, and separate analyses were conducted for the frequency, enjoyment, and obtained pleasure subscales of the PES. After statistically adjusting for the component terms, none of the interaction terms were significant (all $p > .07$), which suggests that the associations between PES and both alcohol-related problems and heavy episodic drinking were not moderated by gender. Remaining analyses were conducted with data collapsed across gender.

Table 1
Descriptive Information on Study Measures

Variable	Mean	*SD*	Range
Alcohol-related problems	0.36	0.79	0–5
Heavy episodic drinking	0.26	0.71	0–3
Pleasant Events Schedule			
Frequency	1.27	0.23	0.67–1.86
Enjoyment	1.60	0.25	0.62–2.00
Obtained pleasure	2.43	0.55	0.76–3.76
Depressive symptoms	8.47	7.88	0–45

To Test Aim 1, the association between the *frequency* of potentially rewarding activities and *enjoyment* derived from the activities with AUD symptoms, alcohol-related problems and heavy episodic drinking were examined in separate analyses using Pearson correlations. The enjoyment and obtained pleasure PES subscales were significantly and negatively correlated with the number of alcohol-related problems; people who reported less enjoyment and obtained pleasure from activities also reported more alcohol-related problems (see Table 2). Lower enjoyment on the PES was also associated with heavy episodic drinking (see Table 2): People who reported less enjoyment also reported more frequent episodes of drinking five or more drinks during the past year. The associations between activity enjoyment and AUD symptoms were greater than the associations between AUD and depressive symptoms (see Table 2).

To Test Aim 2, evaluating whether frequency and enjoyment of activities was uniquely associated with AUD symptoms above and beyond shared association with depressive symptoms, alcohol-related problems and heavy episodic drinking were tested separately. Partial correlations were computed between PES scales and both the number of alcohol-related problems and episodes of heavy drinking, statistically adjusting for CES-D scores. The enjoyment and obtained pleasure PES scales were significantly and negatively correlated with the number of alcohol-related problems, and the enjoyment PES scale was significantly and negatively correlated with the number of episodes drinking five or more drinks, suggesting that these associations were incremental to any shared association with depressive symptoms (see Table 2).[3]

Discussion

The current study was conducted to examine the association between the frequency and enjoyment of potentially rewarding activities with AUD symptoms (alcohol-related problems and heavy episodic drinking) after adjusting for depressive symptoms in a national sample of adults. Results showed a significant negative association between enjoyment of activities and AUD symptoms. Specifically, higher reported mean level of enjoyment of activities was associated with fewer alcohol-related problems and a lower frequency of heavy episodic drinking, even after adjusting for depressive symptoms. There was also a significant negative association between "obtained pleasure," which accounts for both frequency and enjoyment of activities as an approximate measure of response-contingent positive reinforcement (Lewinsohn & Amenson, 1978; MacPhillamy & Lewinsohn, 1982) and alcohol-related problems, such that individuals with greater obtained pleasure from activities in which they participated reported fewer

[2] Of note, given the primary aims of this study, we also considered removing two items that could be seen as substance-related (i.e., "going to a party," "being popular at a gathering"); however, results did not differ when these items were removed; as such, we elected to keep the full MR subscale.

[3] Because age has been shown to covary with alcohol use in prior research (Shaw, Krause, Liang, & McGeever, 2011), we also conducted the analyses adjusting for age. The previously significant associations remained statistically significant ($p < .05$) when statistically controlling for age.

Table 2
Associations Between Frequency and Enjoyment of Activities, Alcohol-Related Problems, Heavy Episodic Drinking, and Depressive Symptoms

Variable	Alcohol-related problems		Heavy episodic drinking		Depressive symptoms
	r	*pr*[a]	*r*	*pr*[a]	*r*
Pleasant Events Schedule					
Frequency	−.07	−.03	.03	.05	−.41***
Enjoyment	−.14**	−.11*	−.10*	−.10*	−.36***
Obtained pleasure	−.13**	−.10*	−.05	−.05	−.40***
Depressive symptoms	.10*	—	.03	—	—

[a] Partial correlation, statistically adjusting for depressive symptoms.
* $p < .05$. ** $p < .01$. *** $p < .001$.

alcohol-related problems. In contrast, *frequency* of activities, without accounting for enjoyment or obtained pleasure, was unrelated to either alcohol outcome. Finally, in contrast to prior research with college student samples (Murphy et al., 2007), gender did not moderate the association between PES scales and AUD in this comparatively older sample.

The results of the current study are consistent with the limited empirical research that has been conducted to date on greater substance-free rewarding activities being associated with lower rates of substance use outcomes (Correia, Carey, & Borsari, 2002; Correia et al., 1998; Correia et al., 2003). The current study builds on and extends these previous findings in several ways. This study demonstrated that enjoyment from activities was negatively associated with AUD symptoms in a national sample of adults, which extends the prior literature in this area that has largely been conducted among college students. In addition, the association between enjoyment from activities and AUD symptoms was present even after statistically adjusting for depressive symptoms in the current study. This is an important extension of prior research, which has largely not included depressive symptoms despite the high level of comorbidity between AUD and depression (Grant et al., 2004). Even though low levels of enjoyment from potentially pleasurable activities have been more commonly implicated in depression, this study shows that low reported levels of enjoyment associated with activities and obtained pleasure are uniquely associated with AUD symptoms. Furthermore, the associations between activity enjoyment and AUD symptoms were greater than the associations between AUD symptoms and depressive symptoms.

The results point to an interesting differentiation between enjoyment versus frequency of pleasurable activities in the association with AUD symptoms, such that alcohol use outcomes were related to the *enjoyment* from activities, as opposed to the *frequency* with which activities occurred. This is in line with behavioral economic theories of substance use, such that substance-free activities must be highly rewarding to compete with substance use. Those activities that are the most reinforcing likely mimic the function of substances (e.g., providing stress relief or pleasure); engaging in "pleasant activities" that are not rewarding to the individual, despite the frequency of engagement, may have little association with drinking behavior. Findings can also be interpreted according to theory of reward deficiency syndrome, which suggests that problematic alcohol use results from aberrant dopaminergic functioning (Blum et al., 1996). As a result of these neurological differences, individuals with AUDs may have abnormal reward sensitivities to alcohol and blunted responses to everyday enjoyable activities.

The current findings have important implications for behavioral AUD intervention efforts. Prior research has shown that interventions that aimed to schedule rewarding substance-free activities demonstrated reductions in problem drinking in college students (Murphy et al., 2005; Reynolds, Macpherson, Tull, Baruch, & Lejuez, 2011). Behavioral activation (BA), a brief, evidence-based intervention originally developed for depression (Dimidjian et al., 2006; Jacobson, Martell, & Dimidjian, 2001; Lejuez, Hopko, Acierno, Daughters, & Pagoto, 2011), also has application for addressing alcohol and other substance use (Daughters, Magidson, Lejuez, & Chen, 2016). BA treatments aim to increase positive reinforcement in one's environment by regularly scheduling structured, value-driven activities that are enjoyable and important to the individual. When BA treatments have been applied to increase healthy, substance-free positive reinforcement in one's environment to reduce substance use, BA-based treatments have shown promising results among patients with alcohol use (Reynolds et al., 2011) and comorbid substance use and depression (Daughters et al., 2008; Magidson et al., 2011).

The design of the current study did not permit an assessment of causality, but the associations identified may inform BA approaches for alcohol use, suggesting that the *quantity* of alternative, substance-free activities may be less important than the *quality* of the activity. Increasing the frequency of substance-free activities may be minimally effective if individuals with AUD do not find the activities to be enjoyable. Interventions that aim to specifically increase enjoyment during substance-free activities (i.e., as opposed to only scheduling substance-free rewarding activities) may show higher success rates. For instance, recent studies have shown that mindfulness may influence one's appraisal of activities. One study showed that mindfulness-based cognitive therapy increased momentary positive emotions and perceived pleasantness of activities in adults with depression (Geschwind, Peeters, Drukker, van Os, & Wichers, 2011). Participants reported greater appreciation of, and responsiveness to, pleasant daily activities. As a result, treatments for AUD that use a combination of BA and mindfulness may be promising for addressing alcohol use by increasing the salience and reward derived from substance-free activities.

The results from the current study should be interpreted in light of the following limitations. First, the design of the current study is cross-sectional, which means that we cannot infer causality or directionality of the findings. Lower rates of enjoyment may result in increased alcohol use, or alternatively, increased heavy alcohol use and related problems may in turn result in decreased enjoyment from or engagement in substance-free activities. Future longitudinal research is needed to test for causality in the relationship between enjoyment of activities and alcohol use. Second, our measure of pleasant events was created to study depression and was not specifically designed to include only "substance-free" activities. Although we removed two items that could be seen as substance-related, this is still a limitation, and future studies should use a measure designed for use in populations with AUD. Additionally, the PES is only an approximate measure of response-

contingent positive reinforcement (MacPhillamy & Lewinsohn, 1982). A true assessment of reinforcement requires observational methods of behavior. Lastly, although there are many advantages to using a national sample, the results from the current study may not be generalizable to non-White racial/ethnic groups (92% of the present sample was White) or to clinical populations. This study included a fairly small number of individuals with both elevated depressive and AUD symptoms. Future studies should examine these relationships in a sample with greater severity of depressive and AUD symptoms.

In conclusion, results from the current study suggest that activity enjoyment is associated with alcohol-related problems and heavy drinking and that these associations were independent of depressive symptoms. Findings suggest that it is the *quality* (i.e., level of enjoyment), not *quantity* (i.e., frequency), of rewarding activities that is associated with AUD symptoms. As a result, interventions for AUDs may be more efficacious if they include techniques to increase participation in highly rewarding activities so that substance-free activities are competitive alternatives to substance use. Future research using a longitudinal design is needed to identify directionality of the associations, and the obtained results need to be replicated in clinical samples. In addition, future studies should investigate the effectiveness of interventions that aim to increase perceived enjoyment of activities through the use of BA and mindfulness.

References

Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.

Blum, K., Sheridan, P. J., Wood, R. C., Braverman, E. R., Chen, T. J. H., Cull, J. G., & Comings, D. E. (1996). The D2 dopamine receptor gene as a determinant of reward deficiency syndrome. *Journal of the Royal Society of Medicine, 89,* 396–400.

Conner, K. R., Pinquart, M., & Gamble, S. A. (2009). Meta-analysis of depression and substance use among individuals with alcohol use disorders. *Journal of Substance Abuse Treatment, 37,* 127–137. http://dx.doi.org/10.1016/j.jsat.2008.11.007

Correia, C. J., Carey, K. B., & Borsari, B. (2002). Measuring substance-free and substance-related reinforcement in the natural environment. *Psychology of Addictive Behaviors, 16,* 28–34. http://dx.doi.org/10.1037/0893-164X.16.1.28

Correia, C. J., Carey, K. B., Simons, J., & Borsari, B. E. (2003). Relationships between binge drinking and substance-free reinforcement in a sample of college students: A preliminary investigation. *Addictive Behaviors, 28,* 361–368. http://dx.doi.org/10.1016/S0306-4603(01)00229-5

Correia, C. J., Simons, J., Carey, K. B., & Borsari, B. E. (1998). Predicting drug use: Application of behavioral theories of choice. *Addictive Behaviors, 23,* 705–709. http://dx.doi.org/10.1016/S0306-4603(98)00027-6

Daughters, S. B., Braun, A. R., Sargeant, M. N., Reynolds, E. K., Hopko, D. R., Blanco, C., & Lejuez, C. W. (2008). Effectiveness of a brief behavioral treatment for inner-city illicit drug users with elevated depressive symptoms: The life enhancement treatment for substance use (LETS ACT!). *Journal of Clinical Psychiatry, 69,* 122–129. http://dx.doi.org/10.4088/JCP.v69n0116

Daughters, S. B., Magidson, J. F., Lejuez, C. W., & Chen, Y. (2016). LETS Act: A behavioral activation treatment for substance use and depression. *Advances in Dual Diagnosis, 9,* 74–84.

Dimidjian, S., Hollon, S. D., Dobson, K. S., Schmaling, K. B., Kohlenberg, R. J., Addis, M. E., . . . Jacobson, N. S. (2006). Randomized trial of behavioral activation, cognitive therapy, and antidepressant medication in the acute treatment of adults with major depression. *Journal of Consulting and Clinical Psychology, 74,* 658–670. http://dx.doi.org/10.1037/0022-006X.74.4.658

Geschwind, N., Peeters, F., Drukker, M., van Os, J., & Wichers, M. (2011). Mindfulness training increases momentary positive emotions and reward experience in adults vulnerable to depression: A randomized controlled trial. *Journal of Consulting and Clinical Psychology, 79,* 618–628. http://dx.doi.org/10.1037/a0024595

Grant, B. F., Stinson, F. S., Dawson, D. A., Chou, S. P., Dufour, M. C., Compton, W., . . . Kaplan, K. (2004). Prevalence and co-occurrence of substance use disorders and independent mood and anxiety disorders: Results from the National Epidemiologic Survey on Alcohol and Related Conditions. *Archives of General Psychiatry, 61,* 807–816. http://dx.doi.org/10.1001/archpsyc.61.8.807

Jacobson, N. S., Martell, C. R., & Dimidjian, S. (2001). Behavioral activation treatment for depression: Returning to contextual roots. *Clinical Psychology: Science and Practice, 8,* 255–270. http://dx.doi.org/10.1093/clipsy.8.3.255

Kessler, R. C., Andrews, G., Mroczek, D., Ustun, B., & Wittchen, H. U. (1998). The World Health Organization Composite International Diagnostic Interview Short-Form (CIDI-SF). *International Journal of Methods in Psychiatric Research, 7,* 171–185. http://dx.doi.org/10.1002/mpr.47

Lejuez, C. W., Hopko, D. R., Acierno, R., Daughters, S. B., & Pagoto, S. L. (2011). Ten year revision of the brief behavioral activation treatment for depression: Revised treatment manual. *Behavior Modification, 35,* 111–161. http://dx.doi.org/10.1177/0145445510390929

Lewinsohn, P. M. (1974). A behavioral approach to depression. In R. Friedman & M. Katz (Eds.), *The psychology of depression: Contemporary theory and research* (pp. 157–185). Washington, DC: Winston-Wiley.

Lewinsohn, P. M., & Amenson, C. S. (1978). Some relations between pleasant and unpleasant mood-related events and depression. *Journal of Abnormal Psychology, 87,* 644–654. http://dx.doi.org/10.1037/0021-843X.87.6.644

Lewinsohn, P. M., & Graf, M. (1973). Pleasant activities and depression. *Journal of Consulting and Clinical Psychology, 41,* 261–268. http://dx.doi.org/10.1037/h0035142

MacPhillamy, D. J., & Lewinsohn, P. M. (1982). The Pleasant Events Schedule: Studies on reliability, validity, and scale intercorrelation. *Journal of Consulting and Clinical Psychology, 50,* 363–380. http://dx.doi.org/10.1037/0022-006X.50.3.363

Magidson, J. F., Gorka, S. M., MacPherson, L., Hopko, D. R., Blanco, C., Lejuez, C. W., & Daughters, S. B. (2011). Examining the effect of the Life Enhancement Treatment for Substance Use (LETS ACT) on residential substance abuse treatment retention. *Addictive Behaviors, 36,* 615–623. http://dx.doi.org/10.1016/j.addbeh.2011.01.016

Murphy, J. G., Barnett, N. P., Goldstein, A. L., & Colby, S. M. (2007). Gender moderates the relationship between substance-free activity enjoyment and alcohol use. *Psychology of Addictive Behaviors, 21,* 261–265. http://dx.doi.org/10.1037/0893-164X.21.2.261

Murphy, J. G., Correia, C. J., Colby, S. M., & Vuchinich, R. E. (2005). Using behavioral theories of choice to predict drinking outcomes following a brief intervention. *Experimental and Clinical Psychopharmacology, 13,* 93–101. http://dx.doi.org/10.1037/1064-1297.13.2.93

Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement, 1,* 385–401. http://dx.doi.org/10.1177/014662167700100306

Reynolds, E. K., Macpherson, L., Tull, M. T., Baruch, D. E., & Lejuez, C. W. (2011). Integration of the brief behavioral activation treatment for depression (BATD) into a college orientation program: Depression and alcohol outcomes. *Journal of Counseling Psychology, 58,* 555–564. http://dx.doi.org/10.1037/a0024634

Ryff, C. D., Seeman, T., & Weinstein, M. (2010). *National Survey of Midlife Development in the United States (MIDUS II): Biomarker project, 2004–2009. ICPSR29282-v1*. Ann Arbor, MI: Inter-university Consortium for Political and Social Research.

Shaw, B. A., Krause, N., Liang, J., & McGeever, K. (2011). Age differences in long-term patterns of change in alcohol consumption among aging adults. *Journal of Aging and Health, 23,* 207–227. http://dx.doi.org/10.1177/0898264310381276

Vuchinich, R. E., & Tucker, J. A. (1988). Contributions from behavioral theories of choice to an analysis of alcohol abuse. *Journal of Abnormal Psychology, 97,* 181–195. http://dx.doi.org/10.1037/0021-843X.97.2.181

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