

Evaluation of App-Based Behavioral Activation for Co-Occurring Depression and Drinking to
Cope During the COVID-19 Pandemic

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Author Note

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Evaluation of App-Based Behavioral Activation for Co-Occurring Depression and Drinking to Cope During the COVID-19 Pandemic

The COVID-19 pandemic is an unprecedented global event which presents numerous challenges, especially as cases in the United States continue to rise. To effectively decrease the number of new cases, states have enacted a range of social distancing measures, many of which have left citizens in self-isolation for days or weeks at a time. Although some states have allowed businesses to reopen their doors and reduced restrictions, millions of people are still out of work and unable to socialize as they did before the pandemic. While necessary to limit mortality in the short term, the secondary and long-term psychological impact of social distancing is unknown (Galea, Merchant, & Lurie, 2020). In particular, concerns of depression and problematic alcohol use have been raised (Rehm et al., 2020; Wang et al., 2020). Theory-guided approaches to intervention for individuals at risk of co-morbid depression and alcohol use are critical. This project aims to study some of these questions, by focusing on the following: (1) examine an integrated operant theory for understanding depression and co-morbid alcohol use during COVID-19, and (2) evaluate the efficacy of an intervention based on this theoretical conceptualization.

Operant theories conceptualize depression as the result of decreased reinforcement from valued activity and concurrent punishment of goal-directed behavior (Carvalho and Hopko, 2011). During the pandemic, many valued self-care activities, such as going to work, exercising at the gym, or spending time with friends and family, may be dangerous. Thus, people who can no longer engage in self-care and other valued activities may be at elevated risk of depression. In this model of depression, overt maladaptive coping behaviors, such as drinking alcohol, serve as avoidance responses that exacerbates depression (Foulds et al., 2015). Behavioral

conceptualizations of addiction view drinking to cope as negatively reinforced through escaping or avoiding negative thoughts or emotions. Over time, this behavior leads to the reduction of positive reinforcement from competing non-drinking related behavior (Bickel et al., 2014). During the pandemic, when non-drinking reinforcement through occupational, social, and entertainment life domains is low, the reinforcing potential of drinking to cope with depressive symptomology may increase (Luciano et al., 2020). Therefore, evaluating the relationship between limited access and engagement in reinforcing activity, the development of depressive symptomology, and drinking to cope is particularly relevant during COVID-19. The first aim of this project is to examine the conceptual rigor of this model during the pandemic through semi-longitudinal assessment over six months.

To test the applied implications of a behavioral conceptualization of depression and drinking to cope during the pandemic, a second aim of the proposed project is to pilot test a smartphone app intervention based on the behavioral model described above to reduce depression and drinking to cope. Interventions delivered through smartphone apps are low cost and highly accessible alternatives to traditional mental health interventions (Donker et al., 2013) with no face-to-face contact during the pandemic. Behavioral activation is an evidence-based intervention supported to treat depression by increasing engagement in positively reinforcing activities (Jacobson, Martell, and Dimidjian, 2006). The second aim of the proposed project is to conduct a pilot randomized controlled trial of the *Behavioral Appivation* intervention (Dahne, Kustanoqitz, and Lejuez, 2018) to treat co-morbid depression and drinking to cope during the pandemic. This intervention is hypothesized to work by increasing reinforcement from valued activities.

Method

Participants

An ongoing project has thus far recruited 1,000 participants age 18 and over residing in the United States who have completed survey assessments to assess for depression and drinking to cope associated with the pandemic. Participants were recruited via social media (e.g., Facebook, Reddit, Twitter) through an anonymous baseline survey between June and July 2020.

Procedure

As an extension of this ongoing project, the proposed study will follow up with 500 individuals from this sample to complete follow-up assessments at three and six months. Participants will be compensated via a reloadable debit card for completion of survey assessments using a lottery style payment system. Up to 100 consenting participants from the follow-up sample who score mild to high severity on the depression scale of the Depression Anxiety and Stress Scale (DASS-21) and the coping subscale of the Drinking Motives Questionnaire (DMQ) will be randomly assigned to a 12-week behavioral activation intervention group using the *Behavioral Appivation* app (n = 50) or a control group. Participants enrolled in the treatment condition will be provided access to *Behavioral Appivation* starting in October 2020, whereas control participants will receive access to the app after the 12-week period. Treatment engagement and self-reported depression and alcohol use will be tracked through the app and assessed using surveys through Qualtrics.

Measures and Statistical Analyses

The study uses several self-report measures, the majority of which have been used in peer-reviewed research on depression and alcohol use, and novel measures adopted and modified to use during COVID-19 related social distancing. A table describing the study measures is

included as an appendix to this proposal. For the first study aim, a time-series structural equation modeling (SEM) approach will be used to simultaneously model the relations among the three central variables of interest (engagement in reinforcing activity as negatively predictive of depression and drinking to cope) and covariates related to the pandemic over six months. The second study aim will be accomplished using a hypothesis testing approach to assess for time-based, within participant and between treatment group changes in reinforcing activity engagement, depressive symptomology, and drinking to cope after the twelve week treatment period.

Implications

The two aims of the project explore the theoretical and applied psychological consequences of the pandemic. By investigating a unified operant theory of depression and drinking to cope, we aim to demonstrate the importance of access to reinforcing activities as an underlying behavioral process. Through testing the efficacy of behavioral activation, we aim to evaluate this as a treatment mechanism with the potential to improve the lives of individuals living through the COVID-19 pandemic.

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Appendix

Measure	Description	Reference
Demographics and COVID experience questionnaire	Includes items to assess engagement with social distancing, current employment, social support, relationship status, gender, age, state of residence, and COVID-19 experience.	N/A
COVID Anxiety Scale	Novel anxiety questionnaire recently published for use in identifying anxiety symptoms specific to COVID-19.	Lee, 2020
Alcohol Use Disorder Identification Test (AUDIT)	Widely utilized screener to assess alcohol use severity.	Bush, Kivlahan, McDonell, Fihn, & Bradley, 1998
Drinking Motives Questionnaire (DMQ-R)	Four factor assessment of motivations for alcohol use.	Cooper, 1994
Alcohol Purchase Task	Survey of reinforcing efficacy of alcohol using hypothetical purchasing.	Murphy & MacKillop, 2006
Brief Young Adult Alcohol Consequences Questionnaire	Survey of consequences related to alcohol use.	Kahler, Strong, & Read, 2005

Proportionate Alcohol Reinforcement Questionnaire-COVID-19 Edition	Measure of the frequency, accessibility, and enjoyment of engagement with rewarding activities, including substance-free and substance-concurrent reinforcement.	Acuff, Dennhardt, Correia, & Murphy, 2019
Behavioral Activation for Depression Scale (BADSD)	Depression questionnaire that measures symptom severity across five subcategories of impairment	Kanter et al., 2007
The Depression Anxiety Stress Scales—21 (DASS-21)	Measure of both depression and anxiety stress related symptomology.	Osman et al., 2012
Suicidal Behaviors Questionnaire (SBQ-R)	Brief measure of risk factors associated with acute suicide risk.	Osman et al., 2001