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Cognitive risk, coping-oriented substance use, and increased avoidance tendencies among depressed outpatients: A prospective investigation

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Abstract

Objective: The present study was designed to assess the interplay between depressive cognition, coping-oriented substance use, and future behavioral disengagement tendencies. Cognitive risk subtypes examined include brooding rumination, attributional bias (internal/stable/global), and dysfunctional attitudes.

Method: Individuals were recruited from outpatient treatment settings and met criteria for a unipolar depressive disorder ($N = 70$; 66% female; 81% White; $M_{\text{age}} = 31$; $SD_{\text{age}} = 13.2$). Participants completed self-report measures of brooding rumination, attributional style, dysfunctional attitudes, coping-oriented substance use, and behavioral disengagement tendencies following a 3-week period.

Results: Brooding rumination, stable attributional style, and dysfunctional attitudes were positively associated with later behavioral disengagement tendencies. Coping-oriented substance use moderated associations between both internal attributional style, as well as dysfunctional attitudes onto later behavioral disengagement.

Conclusions: With regard to stress-related avoidance, subsyndromal substance use may play a detrimental role

among cognitively vulnerable, depressed outpatients when said drug or alcohol use serves as a means of coping.

KEYWORDS

behavioral disengagement, cognitive vulnerability, depression, stress and coping, substance use

1 | INTRODUCTION

Individuals with a history of depression typically demonstrate emotion regulation skills that are contextually inappropriate or maladaptive in nature, resulting in a more chronic pattern of distress and impairment (Gotlib & Hammen, 2008). Broadly, emotion regulation refers to cognitive and behavioral processes serving to alter, induce, delay, or eliminate emotional experiences (Gross, 2015). In particular, depressed individuals tend to rely on passive or avoidance-oriented coping strategies when faced with environmental stressors (Carvalho & Hopko, 2011; Grant et al., 2013; Holahan, Moos, Holahan, Brennan, & Schutte, 2005). It is highly concerning that depressed individuals tend to enact escape-oriented coping responses, as this is likely to limit opportunities to overcome problems/demands and ultimately improve their quality of life. Further research is needed to elucidate malleable, cognitive-behavioral mechanisms that foster avoidance-oriented tendencies within depressed populations.

Behavioral theories of depression posit that excessively avoiding sources of emotional distress can be counterproductive with regard to stress-reduction over time, given that stressors will often remain present or become amplified, eventually requiring confrontation (Carver, 2006; Grant et al., 2013; Holahan et al., 2005). For example, the use of drugs and alcohol is commonly observed among depressed persons (Schuckit, 2006). It is also well established that substance use for coping purposes serves as a risk/maintenance factor for depression, despite its perceived ability to provide short-term relief (e.g., Ralston & Palfai, 2012). Extant literature also indicates that coping-oriented substance use is related to having an avoidant style of coping in general (McConnell, Memetovic, & Richardson, 2014). Thus, to reduce the great individual and societal costs of depression and problematic substance use it may be important to examine the interplay between substance use tendencies and depressive risk factors which may encourage the decision to disengage or “give up” when aversive responsibilities or problems are encountered.

One approach to better understand why depressed persons exhibit elevated tendencies to give up or escape considers the cognitive processes that are typical within this population. Cognitive theories generally attribute the onset and maintenance of depression to rigid, biased, or distorted thought processes, as well as difficulties with cognitive control (Gotlib & Joormann, 2010; Joormann & Stanton, 2016). Research also indicates that noncontextual (i.e., inflexible) cognitive patterns or styles decrease the likelihood of adaptive, goal-directed actions taking place (Bonanno & Burton, 2013; Gotlib & Joormann, 2010). Conversely, it is suggested that processing negative information with flexibility and equanimity increases one's capability of successfully identifying, interpreting, and engaging with life stressors (e.g., Teasdale & Segal, 2007). Though the term “cognitive vulnerability” to depression is a broad and multifaceted construct (Alloy, Salk, Stange, & Abramson, 2017), core cognitive vulnerabilities identified within the literature include thought perseveration (e.g., rumination), negative inferential style (e.g., attributional style), and dysfunctional attitudes (Alloy et al., 2017; Hong & Cheung, 2015). At present, it remains unclear if increases in avoidance orientation can be explained by particular features found within or across these cognitive vulnerability factors.

1.1 | Ruminative thought processing

Rumination is a hallmark characteristic of affective dysregulation. Rumination is characterized by recurring thoughts that are passive and focused on the causes, symptoms, and implications of one's distress (Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008). Research suggests ruminative thinking leads to depression and vice versa through increases in avoidant stress responses (e.g., Moulds, Kandris, Starr, & Wong, 2007). Rumination is theorized to suppress aversive emotions and physiological arousal (Nolen-Hoeksema et al., 2008). Though, ironically, this perseverative means of cognitive avoidance typically perpetuates such affective states. Past work also posits that rumination can prevent active problem-solving via attentional restriction (Lyubomirsky, Tucker, Caldwell, & Berg, 1999; Whitmer & Gotlib, 2013). Additionally, rumination is associated with a decreased willingness to exert efforts towards rewarding activities (Lyubomirsky & Nolen-Hoeksema, 1993; Randles, Flett, Nash, McGregor, & Hewitt, 2010). Past work has also found that rumination predicted greater levels of depression via increased disengagement from one's problems (Hong, 2007). Past work on the temporal effects of perseveration also indicates that behavioral avoidance may be a *consequence* of such styles of thinking, as opposed to being predictors (Dickson, Ciesla, & Reilly, 2012).

Research indicates that substance use may play a key role within the relationship between rumination and escape-focused behavior, such that rumination is positively and reciprocally related to hazardous substance use (e.g., Ciesla, Dickson, Anderson, & Neal, 2011; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007). Multiple studies have demonstrated that highly ruminative adolescents report greater levels of depressive symptoms and substance misuse following negative life events, relative to adolescents who are less ruminative (Skitch & Abela, 2008; Willem, Bijttebier, Claes, & Raes, 2011). Additionally, Nolen-Hoeksema and Harrell (2002) found that rumination was both cross-sectionally and prospectively associated with a greater tendency to consume drugs or alcohol, such that greater levels of rumination predicted heightened levels of coping-oriented substance use.

1.2 | Attributional style

Perhaps one of the most notable and long-standing cognitive models of depression is the hopelessness theory of depression, which describes the onset/maintenance of depression as a consequence of having a dysfunctional and rigid attributional style (Abramson, Metalsky, & Alloy, 1989). Attributional style refers to a habitual manner of explaining or assigning causes of negative life events (Peterson et al., 1982). Attributional style consists of three different dimensions: (a) internality—the degree to which an individual perceives themselves to be at fault for the occurrence of negative events; (b) stability—the degree to which the attributed cause for negative events will persist over time; and (c) globality—the degree to which the attributed cause for negative life events impacts other situations as well (Peterson et al., 1982). Within this framework, research suggests that habitually interpreting the cause(s) of negative life events as being self-relevant, persistent, and pervasive, fosters a sense of hopelessness, which in turn, may decrease goal-oriented activity and increase depression severity (Haefffel et al., 2008). In some cases, this type of stress-response can be considered emotionally adaptive, such as when the stressor is indeed actually uncontrollable (Compas, 1987). However, negative attributional biases can lead to an excessive misperception that stressors are insurmountable. Essentially, a controllable stressor that is misconstrued as persistent (i.e., stable) and omnipresent (i.e., global) appears inexorable, and when the cause of this is attributed to the self (i.e., internal) the desire to escape the circumstances increases. As a consequence, in the face of all types of stress, avoidant coping responses can become favored, habitual, and even reinforcing of the attributional bias. The act of avoidance then becomes evidence that truly, the stressor must have been uncontrollable to address because after all, it was not controlled. This issue may have important implications for substance (ab)users.

Reich and Gutierrez (1987) found that stable and global attributions were higher among substance abusers when compared to non-substance users. Maladaptive attributional biases have been reported among both cocaine- and alcohol-dependent populations as well (Klein, 1998; Sterling, Gottheil, Weinstein, & Lundy, 1996). Findings

from more contemporary research have indicated that heightened levels of internal attribution bias and coping-oriented substance use interact to predict greater daily-level sadness and heightened depression severity over time (Heggeness, Lechner, & Ciesla, 2019). Thus, it is possible that the affective consequences of coping-oriented substance use in conjunction with internal attribution bias dampen one's propensity to maintain an approach-orientation when tending to stressors (e.g., sadness; Carver, 2004).

1.3 | Dysfunctional attitudes

Decades of research suggest that maladaptive, self-referential schema structures are a key element of depression vulnerability (Beck, 1974; Disner, Shumake, & Beevers, 2017). As a higher-order construct, these negative beliefs are often indexed by a measure of dysfunctional attitudes (per Halvorsen, Wang, Eisemann, & Waterloo, 2010). Presently, there is limited empirical evidence of a causal relationship between dysfunctional attitudes and depression symptoms (e.g., Otto et al., 2007). Though originally viewed as a trait-level risk factor, a corpus of research has demonstrated that dysfunctional attitudes are malleable at some capacity (Fresco, Heimberg, Abramowitz, & Bertram, 2006). Specifically, dysfunctional attitudes appear to be mood-dependent and covary with negative affectivity (Miranda & Persons, 1988). As such, dysfunctional attitudes are posited to be influenced by one's coping skillset (Jeanne, Gross, Persons, & Hahn, 1998).

Past research has suggested that problematic substance use is positively associated with dysfunctional attitudes (e.g., Gjestad, Franck, Hagtvet, & Haver, 2011; Kahler, Ramsey, Read, & Brown, 2002). Within the framework of a diathesis-stress model, it is highly plausible that dysfunctional attitudes and the use of drugs or alcohol share a dynamic relationship within the context of depression vulnerability. For instance, dysfunctional attitudes are believed to impede one's ability to accurately process negative feedback from the environment (Panzarella, Alloy, & Whitehouse, 2006). Thus, one could argue that depressed persons may be less willing to pursue goals due to poor self-perceptions or unnecessary/self-imposed pressures to be able to do so successfully or without making mistakes (e.g., Stoeber, Damian, & Madigan, 2017). If such is to occur, the emotion-dysregulatory impact of substance use may moderate the relationship between dysfunctional attitudes and behavioral inhibition by prolonging/bolstering these maladaptive beliefs. It is also notable that research on dysfunctional attitudes and substance use has focused primarily on affective outcomes, underscoring a need to expand the interaction between these factors onto self-regulatory outcomes as well.

Taken together, prior research on these depressogenic cognitive subtypes, their potential interaction with substance use, and the temporal quality of these effects within the context of approach-avoidance conflict behavior has relied heavily on cross-sectional designs and convenience-sampling methods, underscoring the need for advances in this area of clinical research. Though relatively meager in quantity, extant literature focused on brooding rumination, attributional style, and dysfunctional attitudes demonstrating short-term, prospective associations and/or changes in negative affectivity or depression severity is compelling (e.g., Connolly & Alloy, 2017; Hankin, Fraley, & Abela, 2005; Heggeness et al., 2019; Vanderhasselt et al., 2014). It is possible that if one is cognitively susceptible to experiencing negative affect or stress with a concurrent penchant to engage in drug or alcohol use to cope, opportunities to practice available coping techniques that are more adaptive or contextually appropriate may become restricted (Clark, Ringwalt, & Shamblen, 2011; Cludius, Mennin, & Ehring, 2020). If so, those failing to practice adaptive coping skills may become less likely to sufficiently persist in approach-oriented self-regulatory actions when experiencing distress over time.

1.4 | Aims and hypotheses

The present investigation was designed (a) to examine whether brooding rumination, attributional bias, and dysfunctional attitudes are associated with later tendencies to behaviorally disengage from stressors, (b) to test whether coping-oriented substance use frequency is associated with later tendencies to behaviorally disengage

from stressors, and (c) to test coping-oriented substance use as a moderator within the prospective relationships between each cognitive vulnerability factor of interest and the tendency to behaviorally disengage from stressors.

Specifically, we hypothesized that brooding rumination, (internal/stable/global) attributional biases, and dysfunctional attitudes would each demonstrate positive associations with behavioral disengagement tendencies at Time 2. We also anticipated that coping-oriented substance use would be positively associated with behavioral disengagement tendencies at Time 2 as well. Lastly, we hypothesized that coping-oriented substance use would moderate the associations between each cognitive risk subtype and later behavioral disengagement levels. Specifically, we anticipated that individuals with heightened severities of cognitive risk would report greater disengagement tendencies when stressed if also reporting heightened frequencies of coping via drug or alcohol use, relative to those with lesser degrees of cognitive risk and/or lower frequencies of coping-oriented substance use.

2 | METHODS

2.1 | Study sample and procedure

The current study is derived from a parent research project that was designed to examine risk/maintenance factors of depression. Seventy treatment-seeking adults were recruited from two outpatient psychological treatment settings (66% female, 81% White, $M_{\text{age}} = 31$, $SD_{\text{age}} = 13.2$). Participants varied with regard to treatment modality (i.e., psychotherapy, pharmacological therapy), as well as duration and dose of current treatment. Potential participants were required to have a history of a unipolar depressive disorder and were considered ineligible if they reported a history of mania or psychosis, or if they met criteria for a current substance use disorder. Prospective participants were consented and screened by trained graduate-level research assistants or doctoral-level professionals using a semi-structured diagnostic interview (SCID-IV; First, Spitzer, Gibbon, & Williams, 1996). Fifteen individuals were excluded from participation based on diagnostic history: seven persons did not meet criteria for depressive disorder; seven persons met criteria for bipolar disorder (type I or II); one person reported a history of psychosis. Interrater reliability of diagnoses was strong ($\kappa = 0.84$). Eligible participants completed a battery of self-report measures pertaining to cognitive vulnerability to depression, as well as coping behaviors. Three weeks after the initial laboratory visit, participants returned and provided responses to a duplicate battery of self-report measures (Time 2). Participants were compensated with \$58 dollars in total for attending both laboratory appointments. Study procedures were approved by all affiliated institutional review boards (IRB).

2.2 | Measures

The *Response Styles Questionnaire–Rumination Response Scale* (RSQ–RRS; Nolen-Hoeksema & Morrow, 1991) is a 25-item scale assessing depressive rumination. Factor analyses of the RSQ–RRS evince two distinct subscales—*reflection* and *brooding* (Trenor, Gonzalez, & Nolen-Hoeksema, 2003). Respondents rate each item on a scale from 1 (*almost never*) to 4 (*almost always*). Prior research suggests the RSQ–RRS provides good convergent and predictive validity (Butler & Nolen-Hoeksema, 1994; Nolen-Hoeksema & Morrow, 1991). Specifically, the brooding rumination subscale was used as a predictor within the hypothesized model. Internal consistency for the brooding rumination subscale was good ($\alpha = .86$).

The *Attributional Style Questionnaire* (ASQ; Peterson et al., 1982) is a self-report inventory that assesses attributions for six positive and six negative hypothetical events along the dimensions of internality, stability, and globality. The ASQ has demonstrated adequate psychometric properties across both clinical and nonclinical samples (Hu, Zhang, & Yang, 2015). Scores for each ASQ subscale were computed by aggregating responses, therefore, a higher total score reflects a greater degree of attributional bias toward negative life events. Internal consistency

for ASQ subscales were modest, yet, consistent with extant literature (Internal: $\alpha = .51$, Stable: $\alpha = .63$, Global: $\alpha = .69$; Hu et al., 2015; Peterson et al., 1982).

The *Dysfunctional Attitudes Scale* (DAS; Weissman & Beck, 1978) is a 40-item self-report measure. Responses are provided using a 7-point Likert scale ranging from 1 (*totally disagree*) to 7 (*totally agree*). The DAS has demonstrated strong psychometric properties and has been used successfully in research on depressed and substance using samples (Gjestad et al., 2011; Kahler et al., 2002; Otto et al., 2007). Available literature indicates that the factor structure of the DAS remains largely equivocal; though, items within the DAS broadly assesses for maladaptive/self-referential beliefs that one's well-being depends on perfectionistic achievement, having a sense of control, and the approval of others (Brown, Hammen, Craske, & Wickens, 1995; Moore, Fresco, Segal, & Brown, 2014; Weissman & Beck, 1978). Internal consistency for the DAS was strong ($\alpha = .93$).

The *Brief Coping Orientation to Problems Experienced* (Brief COPE; Carver, 1997) is a self-report instrument consisting of 28 items. The Brief COPE assesses how frequently an individual is relying upon various coping strategies. The Brief COPE has demonstrated good psychometric properties in both clinical and nonclinical populations (Carver, 1997). Respondents indicate the extent to which they have engaged in a particular coping strategy. The "Substance Use" subscale (COPE-SU; two items) was utilized to assess the degree to which participants engaged in substance use as a means of coping with distress. Using a 4-point Likert scale, responses range from 1 (*I haven't been doing this at all*) to 4 (*I've been doing this a lot*). Internal consistency for the COPE-SU was strong ($\alpha = .98$). The "Behavioral Disengagement" subscale (COPE-BD; 2 items) was used to index the degree to which participants have discontinued actively attending to sources of stress (i.e., "giving up"). The COPE-BD served as the outcome variable within the hypothesized models. Greater scores on the COPE-BD indicate stronger tendencies to desist in one's attempts to confront/overcome a stressor. The COPE-BD subscale demonstrated adequate internal consistency ($\alpha = .82$). Though the moderating and outcome variables within the hypothesized models are derived from the same questionnaire, their weak bivariate correlation strongly supports their discriminant validity ($r = .18, p > .05$).

3 | RESULTS

3.1 | Analytic strategy

To assess prospective behavioral disengagement scores (Time 1 to Time 2), linear regression analyses were conducted using SPSS 25.0. Gender, age, and baseline COPE-BD scores were included as covariates in step one of each tested linear regression model, followed by the predictor variable (respective cognitive vulnerability); and the moderating variable (coping-oriented substance use) was entered in step two, and finally, the interaction term (product of predictor and moderator variables) was entered in step three. Simple slope analyses were conducted to probe associations between each cognitive vulnerability factor of interest and later behavioral disengagement at low (-1 standard deviation [SD]) and high ($+1$ SD) levels of coping-oriented substance use. Regression-coefficients (β) reported in the present study are standardized. The overarching hypothesis in this study is that substance use to cope moderates the relation between cognitive vulnerability to depression and later behavioral disengagement tendencies; though five different indices of cognitive vulnerability were included. Thus, we conducted a Bonferroni correction for multiple comparisons to conservatively adjust for these five tests and only $p < .01$ were interpreted as being statistically significant. Descriptive statistics are reported in Table 1. See Figure 1 for the illustration of the hypothesized model(s).

3.2 | Preliminary analyses

First, separate linear regression analyses were conducted to test for main effects between gender, age, and coping-oriented substance use onto COPE-BD scores at Time 2 while controlling for baseline COPE-BD scores. Results

TABLE 1 Means, standard errors (SE), and standard deviations (SD)

	Mean	SE	SD
Age	30.95	1.53	13.19
COPE-SU	1.74	0.12	1.05
COPE-BD (Time 1)	1.70	0.10	0.83
COPE-BD (Time 2)	1.76	0.10	0.85
Brooding rumination	14.55	0.48	4.12
Internal Attributional Style	29.34	0.72	6.00
Stable Attributional Style	27.68	0.58	4.83
Global Attributional Style	28.51	0.80	6.62
Dysfunctional Attitudes	146.62	4.35	37.44

Abbreviations: COPE-BD, Brief Coping Orientation to Problems Experienced—Behavioral Disengagement subscale; COPE-SU, Brief Coping Orientation to Problems Experienced—Substance Use subscale.

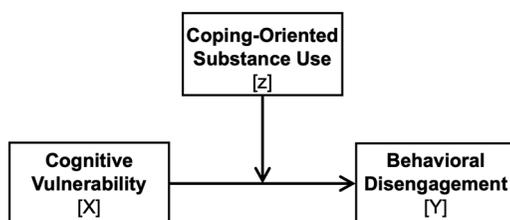
indicated that gender was not significantly associated with later COPE-BD scores ($\beta = -.15$, $t = -1.5$, $p = .140$, 95% CI [-0.648, 0.108]). Similarly, age did not demonstrate a statistically significant association with COPE-BD scores at Time 2 ($\beta = -.004$, $t = -0.56$, $p = .577$, 95% CI [-0.016, 0.011.]). Coping-oriented substance use was not significantly associated with COPE-BD scores at time 2 ($\beta = .17$, $t = 1.6$, $p = .102$, 95% CI [-0.028, 0.301]).

3.3 | Primary analyses

Brooding rumination yielded a significant main effect onto later COPE-BD scores ($\beta = .29$, $t = 2.7$, $p = .009$, 95% CI [0.016, 0.106]). However, Brooding rumination did not demonstrate a significant interaction effect with coping-oriented substance use onto later COPE-BD scores ($\Delta R^2 < 0.01$, $t = -0.46$, $p = .650$, 95% CI [-0.056, 0.036]).

ASQ-stability showed a significant association with later COPE-BD scores, whereas ASQ-internality and ASQ-globality did not yield statistical significant associations onto later COPE-BD scores: ASQ-internal ($\beta = .13$, $t = 1.2$, $p = .241$, 95% CI [-0.013, 0.049]); ASQ-stable ($\beta = .32$, $t = 3.0$, $p = .004$, 95% CI [0.018, 0.090]); ASQ-global ($\beta = .20$, $t = 1.6$, $p = .116$, 95% CI [-0.006, 0.055]). Internal attributional style demonstrated a significant interaction effect with coping-oriented substance use ($\Delta R^2 = .08$, $t = 2.8$, $p = .006$, 95% CI [0.010, 0.059]). At high levels of coping-oriented substance use, internal attribution bias was associated with greater COPE-BD scores at Time 2 ($\beta = .05$, $t = 2.5$, $p = .014$, 95% CI [0.001, 0.083]). At low levels of coping-oriented substance use, internal attribution bias' association with later COPE-BD scores was not statistically significant ($\beta = -.015$, $t = -0.85$, $p = .402$, 95% CI [-0.052, 0.021]). The remaining ASQ subscales did not demonstrate significant interaction effects

FIGURE 1 Hypothesized model of cognitive vulnerability to depression onto behavioral disengagement when stressed moderated by coping-oriented substance use. X is the predictor, Z is the moderator, and Y is the outcome



onto later COPE-BD scores: ASQ-stable ($\Delta R^2 = 0.01$, $t = 1.2$, $p = .235$, 95% CI [-0.013, 0.053]) and ASQ-global ($\Delta R^2 < 0.001$, $t = -0.10$, $p = 0.920$, 95% CI [-0.033, 0.030]).

Dysfunctional attitudes demonstrated a statistically significant main effect onto COPE-BD scores at Time 2 ($\beta = .35$, $t = 3.3$, $p = .002$, 95% CI [0.003, 0.013]). Dysfunctional attitudes also interacted with coping-oriented substance use in the prediction of COPE-BD scores at Time 2 ($\Delta R^2 = 0.08$, $t = 3.2$, $p = .002$, 95% CI [0.002, 0.010]). At high levels of coping-oriented substance use, dysfunctional attitudes were associated with greater COPE-BD scores at time 2 ($\beta = .01$, $t = 4.3$, $p = .002$, 95% CI [0.008, 0.021]). At low levels of coping-oriented substance use, dysfunctional attitudes' association with later COPE-BD scores was not statistically significant ($\beta < .01$, $t = 1.2$, $p = .233$, 95% CI [-0.002, 0.009]). Results of moderation model testing can be found in Table 2 (see Figure 2 for illustrations of all observed interaction effects). Bivariate correlations are reported in Table 3.

4 | DISCUSSION

The present investigation utilized a clinical sample recruited from outpatient settings to examine core cognitive vulnerabilities to depression (i.e., perseveration, inferential style, and dysfunctional attitudes), coping-oriented substance use, and their prospective relations with avoidance tendencies when stressed. More specifically, the present study was conducted to test whether brooding rumination, negative attributional biases, and dysfunctional attitudes interact with coping-oriented substance use in the prediction of one's tendency to behaviorally disengage when stressed following a 3-week period. Results were partially supportive of hypotheses.

Our results suggest that depressed individuals who engage in high-level brooding rumination are increasingly likely to behavioral disengage when confronted with stressors over time. This finding is important because such disengagement is common among depressed persons and is believed to contribute to poorer treatment outcomes (Trew, 2011). This observation contributes to a body of literature that is presently dominated by cross-sectional designs and nonclinical samples (e.g., Hong, 2007; Moulds et al., 2007), providing further evidence that ruminative thought processing plays a meaningful role in shaping one's behavior or goal-directed efforts. Contrary to hypotheses, brooding rumination did not moderate the effect of coping-oriented substance use on later COPE-BD scores. This shows some congruence with a prior study that found a cross-sectional link between brooding rumination and substance use problems but not substance use *frequency* among adolescents (Willem et al., 2011). It is plausible that our hypothesized interaction effect between brooding rumination and coping-oriented substance use failed to reach statistical significance given that items within the Brief COPE measure ask for self-reported frequencies of coping behavior.

Additionally, we anticipated that heightened internal, stable, and global attributional biases towards negative life events would predict greater behavioral disengagement, yet, only the stability subscale of the ASQ demonstrated a statistically significant main effect onto later COPE-BD scores. It may be appropriate to consider this finding from a behavioral economics perspective, as it seems logical for persons to disengage from stressors if the individual sees the stressor to be an inevitable constant within their life. Note, associations between ASQ-stability scores and later disengagement tendencies remained statistically significant when including coping-oriented substance use and their interaction term within the full regression model as well. Unlike attributional stability and globality, the effect of internality was moderated by coping-oriented substance use. These findings indicate that tendencies to engage in self-blame coupled with a proclivity to indulge in drug or alcohol use to relieve stress may decrease one's willingness to actively engage with stressors over time. This interaction effect contributes to a growing body of work that identifies internally-directed attributions as a prominent risk factor among those who engage in alcohol or substance use to cope (e.g., Fairbairn & Sayette, 2014; Heggeness et al., 2019). Holding an internal attribution bias could imply feelings of being fundamentally inept or incapable of overcoming stressful situations/circumstances. It is also well documented that coping-oriented substance use tendencies coincide strongly with poor perceptions of one's ability to tolerate distress (e.g., Buckner, Keough, &

TABLE 2 Interactive associations of cognitive risk and coping-oriented substance use in relation to later behavioral disengagement

	β	t	p Value	95% CI	R ² Change
<i>(a) Predictor: Brooding rumination; Outcome: Disengagement from stressors (per COPE-BD)</i>					
Step 1					
Gender	-.15	-1.42	.159	-0.648, 0.108	
Age	<-.01	-0.38	.706	-0.016, 0.011	
COPE-BD (Time 1)	.58***	5.24	<.001	.355, 0.804	0.333***
Step 2					
Brooding rumination	.27	2.41	.019	0.009, 0.101	
COPE-SU	.12	1.22	.226	-0.063, 0.261	0.08*
Step 3					
Brooding rumination×COPE-SU	-.01	-0.45	.657	-0.056, 0.036	0.002
<i>(b) Predictor: Internal attributional style (ASQ-Internal); Outcome: Disengagement from stressors (per COPE-BD)</i>					
Step 1					
Gender	-.15	-1.42	.159	-0.648, 0.108	
Age	<-.01	-0.38	.706	-0.016, 0.011	
COPE-BD (Time 1)	.58***	5.24	<.001	0.355, 0.804	0.333***
Step 2					
Internal attributional style	.11	0.99	.328	-0.016, 0.046	
COPE-SU	.14	1.26	.212	-0.064, 0.282	.034
Step 3					
ASQ-Internal×COPE-SU	.04**	2.82	.006	0.010, 0.059	.082**
<i>(c) Predictor: Stable attributional style (ASQ-Stable); Outcome: Disengagement from stressors (per COPE-BD)</i>					
Step 1					
Gender	-.15	-1.42	.159	-0.648, 0.108	
Age	<-.01	-0.38	.706	-0.016, 0.011	
COPE-BD (Time 1)	.58***	5.24	<.001	0.355, 0.804	0.333***
Step 2					
Stable attributional style	.30**	2.70	.009	0.013, 0.087	
COPE-SU	.08	0.76	.451	-0.105, 0.233	0.099
Step 3					
ASQ-Stable×COPE-SU	.02	1.20	.235	-0.013, 0.053	0.015
<i>(d) Predictor: Global attributional style (ASQ-Global); Outcome: Disengagement from stressors (per COPE-BD)</i>					
Step 1					
Gender	-.15	-1.42	.159	-0.648, 0.108	
Age	<-.01	-0.38	.706	-0.016, 0.011	
COPE-BD (Time 1)	.58***	5.24	<.001	0.355, 0.804	0.333***
Step 2					
Global attributional style	.18	1.43	.158	-0.009, 0.053	
COPE-SU	.14	1.24	.219	-0.065, 0.277	0.019
Step 3					
ASQ-Global×COPE-SU	<-.01	-0.10	.920	-0.033, 0.030	<0.001

(Continues)

TABLE 2 (Continued)

	β	t	p Value	95% CI	R ² Change
<i>(e) Predictor: Dysfunctional attitudes (DAS); Outcome: Disengagement from stressors (per COPE-BD)</i>					
Step 1					
Gender	-.15	-1.42	.159	-0.648, 0.108	
Age	<-.01	-0.38	.706	-0.016, 0.011	
COPE-BD (Time 1)	.58***	5.24	<.001	0.355, 0.804	0.333***
Step 2					
Dysfunctional attitudes	.33**	2.76	.007	0.002, 0.013	
COPE-SU	.05	0.42	.673	-0.136, 0.209	0.095**
Step 3					
DAS×COPE-SU	.006**	3.22	.002	0.002, 0.010	0.081**

Abbreviations: ASQ, Attributional Style Questionnaire; CI, confidence interval; COPE-BD, Coping Orientation to Problems Experienced—Behavioral Disengagement subscale; COPE-SU, Coping Orientation to Problems Experienced—Substance Use subscale; DAS, Dysfunctional Attitudes scale.

* $p < .05$.

** $p < .01$.

*** $p < .001$.

Schmidt, 2007). Thus, depressed individuals who rely heavily on substances to cope while also holding this internally focused attributional bias maybe, especially, lacking in confidence when attempting to rectify a distressing situation or circumstance, thereby supporting decisions to withdraw and cope on a more affect-specific level (e.g., Liberman & Trope, 1998). Our results also suggest that internal attributional style shares a unique relationship with substance use behavior.

Lastly, dysfunctional attitudes demonstrated a positive, main effect onto later behavioral disengagement tendencies. As hypothesized, this effect was strengthened when accompanied by a heightened frequency of coping-oriented substance use. Strong dysfunctional attitudes may result in greater disengagement from stressors due to having unrealistic standards and the emotional consequences that result from self-perceived mistakes—a critical issue given that making errors is an integral aspect of learning and problem-solving activity (Chialvo & Bak, 1999). Moreover, those who rely on drugs or alcohol to cope may be increasingly apprehensive to make mistakes due to

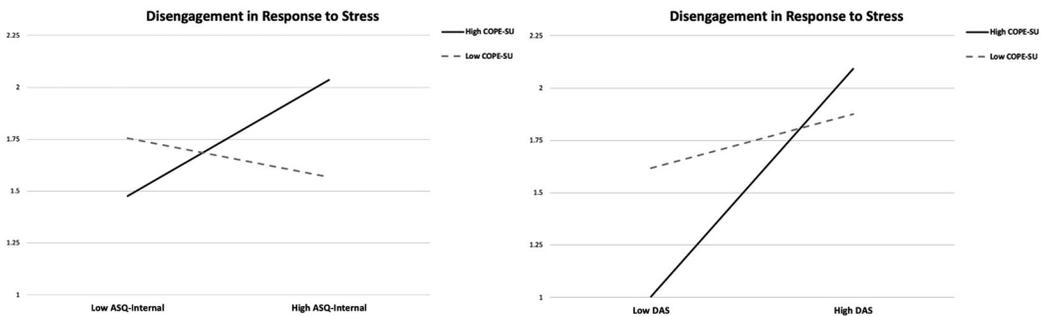


FIGURE 2 Statistically significant interaction effects of cognitive vulnerability and coping-oriented substance use predicting behavioral disengagement tendencies (Time 2) in response to stress. High and low levels correspond respectively to values +1 SD and -1 SD from the mean. COPE-SU, Brief Coping Orientation to Problems Experienced—Substance Use subscale; ASQ-Internal, Attributional Style Questionnaire—Internality subscale; DAS, Dysfunctional Attitudes Scale; SD, standard deviation

TABLE 3 Bivariate correlations among variables

	1	2	3	4	5	6	7	8	9
1. Age	1	-.075	.174	.06	-.108	-.114	-.023	.113	.008
2. COPE-SU	-.075	1	.184	.292*	.236*	.161	.239*	.166	.389**
3. COPE-BD (Time 1)	.174	0.184	1	.556**	.381**	.239*	0.13	.391**	.396**
4. COPE-BD (Time 2)	.06	.292*	.556**	1	.480**	.259*	.393**	.405**	.517**
5. Brooding rumination	-.108	.236*	.381**	.480**	1	.177	.288*	.497**	.498**
6. ASQ-Internal	-.114	0.161	.239*	.259*	.177	1	.484**	.336**	.461**
7. ASQ-Stable	-.023	.239*	0.13	.393**	.288*	.484**	1	.480**	.601**
8. ASQ-Global	.113	0.166	.391**	.405**	.497**	.336**	.480**	1	.545**
9. Dysfunctional attitudes	.008	.389**	.396**	.517**	.498**	.461**	.601**	.545**	1

Note: Female coded 0 and male coded 1 for gender variables.

Abbreviations: ASQ-Global, Attributional Style Questionnaire—Globality subscale; ASQ-Internal, Attributional Style Questionnaire—Internality subscale; ASQ-Stable, Attributional Style Questionnaire—Stability subscale; COPE-BD, Brief Coping Orientation to Problems Experienced—Behavioral Disengagement subscale; COPE-SU, Brief Coping Orientation to Problems Experienced—Substance Use subscale.

* $p < .05$.

** $p < .01$.

having a deficient set of coping or problem-solving skills in general. In all, these findings contribute to a limited body of work highlighting the interplay between negative self-directed thinking, substance use behaviors, and prospective depression-related consequences.

4.1 | Clinical considerations

Considering that our results were seen within a treatment-seeking sample, our findings may offer guidance regarding the hazards and clinical relevance of subsyndromal substance use behavior among outpatients. Indeed, our sample consisted of depressed individuals without diagnosable substance-related disorders; however, we view this to be a strength of the study as it pertains to informing comorbidity-prevention efforts. It is well established that depressed individuals are at heightened risk for developing substance-related disorders (see O'Neil, Conner, & Kendall, 2011) and research such as the current investigation may help elucidate the processes involved in the development of substance-related pathology in this population. Our findings suggest it may be beneficial for mental health service providers to be cognizant of their client's pattern and motives for using drugs or alcohol, regardless of whether or not the individual meets the criteria for a substance use disorder. Additionally, given the robust effect sizes shared by both internal attribution bias and dysfunctional attitudes when interacting with coping-oriented substance use, individuals observed to hold these cognitive vulnerabilities who also seek drugs or alcohol for emotional relief may find cognitive-based interventions to be especially beneficial in mitigating stress-generated avoidance over time.

4.2 | Limitations and future directions

There are limitations to the present investigation warranting mention. First, we did not assess the types/classes of substances being used within our sample. Future studies may wish to explore potentially distinct effects across

substances of abuse as an extension of this study. Further, the measurement of substance use behavior in this study pertained to one's frequency of use, and not the quantity of use per se. For instance, two select individuals could have plausibly engaged in a similar number of substance use episodes while consuming dissimilar amounts of said substances. The present study also relied upon self-reported measures. It is recommended that future work considers additional means of measuring disengagement tendencies (e.g., behavioral tasks). Treatment type, frequency, and dosage were not examined in this study, and this sample lacks a nontreated comparison group. As such, we were not able to examine the influence of current treatment on the observed effects. Considering substance use is typically assessed in treatment for depression and cautioned against (Love & Zatzick, 2014), it is reasonable to hypothesize that contact with mental health professionals would be most likely to diminish our observed effects rather than producing artifacts. We also encourage researchers to consider extending our findings to include treatment data, in addition to testing other related outcomes of clinical interest (e.g., homework adherence, treatment attrition, etc.). In support of this suggestion, a modest body of research has demonstrated that dysfunctional attitudes may be directly, as well as indirectly, related to substance use treatment response (e.g., alcohol recovery and smoking cessation; Gjestad et al., 2011; Kahler et al., 2002). Despite these limitations, we believe that the present study offers novel insight regarding the processes by which cognitive rigidities and subclinical substance use may impact avoidance levels among those seeking treatment for depression.

5 | CONCLUSIONS

In sum, the present study indicates that brooding rumination, stable and internal attribution biases, as well as dysfunctional attitudes, carry a substantive risk of fostering behavioral disengagement tendencies (i.e., avoidance) among individuals suffering from depression. Specifically, our findings provide evidence that high-level internal attribution bias and dysfunctional attitudes can play meaningful roles concerning one's willingness to sustain proactive coping efforts over time; particularly, when such risk factors coincide with a propensity to use drugs or alcohol as a means of coping. Congruent with past work, the current study also indicates that future avoidance tendencies are likely to be elevated among depressed persons who demonstrate high levels of brooding rumination or the tendency to perceive the cause of stressors to be stable over time. Lastly, and perhaps most notably, this study highlights that coping-oriented substance use at a subsyndromal level should not be dismissed when assessing and/or treating cognitively vulnerable persons who present with a history of depression.

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