



## Depressive symptoms, ruminative thinking, drinking motives, and alcohol outcomes: A multiple mediation model among college students in three countries



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### HIGHLIGHTS

- Tested a multiple mediation model among college drinkers in Argentina, Spain and US.
- Ruminative thinking is a mechanism linking depressive symptoms to drinking to cope.
- Depressive symptoms relate to alcohol problems via rumination and drinking to cope.
- Models were invariant across countries/sex, suggesting a culturally-universal model.

### ARTICLE INFO

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### ABSTRACT

**Background:** Recent research suggests that ruminative thinking (specifically problem-focused thoughts) may explain why individuals engage in drinking to cope (DTC) when dealing with depressive symptoms; which in turn leads to increased negative alcohol-related consequences. Cross-cultural studies addressing these phenomena are scarce.

**Objectives:** The present study cross-culturally tested whether four rumination facets (problem-focused thoughts, counterfactual thinking, repetitive thoughts, and anticipatory thoughts) uniquely mediate the relationships between depressive symptoms and drinking motives/alcohol outcomes in a multicultural sample of college student drinkers ( $n = 1429$ ) from Spain, Argentina, and the U.S.

**Method:** Structural equation modeling was conducted to test the models, controlling for sex. Further, we conducted invariance testing to determine whether our models were culturally-specific or culturally-universal.

**Results:** Within both proposed models, no rumination facet uniquely mediated the relationship between depressive symptoms and drinking motives. However, an exploratory model with a second-order latent factor of ruminative thinking did significantly mediate these associations (exception was conformity motives). Further, there were two significant double-mediated associations that suggested that increased depressive symptoms is associated with increased ruminative thinking, which is associated with higher DTC motives, which in turn is associated with higher alcohol consumption and negative alcohol-related consequences. All models were found to be invariant across countries and sex, suggesting that these associations may be relatively universal.

**Conclusions:** Rumination is relevant to understand the increased vulnerability of college drinkers to exhibit greater alcohol consumption and negative consequences via DTC motives when dealing with depressive symptoms.

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## 1. Introduction

Among college students, depressive symptoms has been found to be a robust risk factor associated with increased alcohol consumption (see Pedrelli, Borsari, Lipson, Heinze, & Eisenberg, 2016 for an overview) and negative alcohol-related consequences (Armeli, Conner, Cullum, & Tennen, 2010; Armeli et al., 2014; Dennhardt & Murphy, 2011). Drinking to cope motives has been found to be a robust psychosocial mechanism that explains (i.e., mediates) the associations between depressive symptoms and negative alcohol-related consequences among college students (Bravo & Pearson, 2017; Kenney, Jones, & Barnett, 2015; Kenney, Merrill, & Barnett, 2017). Despite the extensive support of depressive symptoms relating to negative alcohol-related consequences via drinking to cope motives, few studies have examined psychosocial factors that may explain why individuals engage in drinking to cope when dealing with depressive symptoms and how this may lead to increased negative alcohol-related consequences.

Ruminative thinking is one construct that has been recently proposed as a mechanism linking depressive symptoms to drinking to cope motives and in turn to negative alcohol-related consequences. Supporting Response Styles Theory (Nolen-Hoeksema, 1991; Nolen-Hoeksema, Wisco, & Lyubormisky, 2008), rumination has been shown to be a robust risk factor for alcohol use/misuse (Ciesla, Dickson, Anderson, & Neal, 2011; Nolen-Hoeksema & Harrell, 2002; Nolen-Hoeksema, Stice, Wade, & Bohon, 2007). Ciesla et al. (2011) concluded, “It is possible that individuals may drink in order to interrupt the repetitive, obsessive thoughts which exacerbate and prolong negative moods, rather than simply drinking due to the affective state itself” (pg. 149). Recently, Bravo, Pearson, and Henson (2017) tested this assertion by examining whether four distinct facets of rumination (i.e., problem-focused thoughts, counterfactual thinking, repetitive thoughts, and anticipatory thoughts) mediated the associations between depressive symptoms and drinking to cope motives, which in turn relate to negative alcohol-related consequences. The researchers found only one significant double-mediated association such that elevated depressive symptoms was associated with higher problem-focused thoughts (i.e., consistent thinking of causes, consequences, and symptoms of negative affect), which was associated with higher drinking to cope motives, which in turn was associated with higher negative alcohol-related consequences. Taken together, this study provides preliminary support for ruminative thinking as a mechanism linking depressive symptoms to drinking to cope motives.

Although an important preliminary study, the present study sought to cross-culturally replicate and extend these findings by examining, in a multicultural sample, four distinct research questions: a) are the effects they found in the double-mediation model extendible to alcohol consumption as an outcome, b) to what extent are the effects they found in the double-mediation model replicable when other drinking motives are introduced into the model (hypothesized mediation model), c) do rumination facets mediate the relationship between depressive symptoms and other drinking motives (comprehensive model), and d) are these models invariant across sex and different cultures/countries. Based on findings from Bravo et al. (2017), we expected that problem-focused thoughts would emerge as the strongest facet most relevant in the pathway to problematic alcohol consumption.

## 2. Method

### 2.1. Participants & procedures

College students from four distinct universities ( $n = 1864$ ) across the U.S. (two universities; one located in the southeast and the other in the southwest), Argentina, and Spain participated in an online survey study regarding personal mental health, personality traits, and alcohol use behaviors (for more information on recruitment procedures, see Bravo et al., in press). For the present study, we only used data from

students who completed the rumination measure and consumed alcohol at least once in the previous month ( $n = 1429$ ; 65.7% women [U.S. sites combined,  $n = 733$ , 70.5% women; Argentina,  $n = 404$ , 52.2% women, Spain,  $n = 292$ , 72.3% women]). The study was approved by the institutional review boards (or their international equivalent) at the participating universities.

### 2.2. Measures

#### 2.2.1. Depressive symptoms

We used the 20-item Center for Epidemiological Studies Depression (CESD; Radloff, 1977) and the 20-item Spanish Version (Masten, Cadwell-Colbert, Alcala, & Mijares, 1986; Perczek, Carver, & Price, 2000) to assess depressive symptoms at the U.S. sites and at the Spain/Argentina sites, respectively. Participants indicated how often they had felt the way described by each item during the previous week. Response scale ranged from 0 (*Not at all or < 1 day*) to 3 (*Nearly Every day for 1 week*).

#### 2.2.2. Rumination

Rumination was measured with the RTSQ (Brinker & Dozois, 2009). Participants were instructed to indicate how well each item described them on a 7-point response scale (1 = *Not at all*, 7 = *Very Well*). In Spain and Argentina, we employed the Spanish version of the RTSQ (see translating and adaptation procedures in Bravo et al., in press). Although originally examined as a single factor, Tanner et al. (2013) revealed four rumination subcomponents: problem-focused thoughts, counterfactual thinking, repetitive thoughts, and anticipatory thoughts.

#### 2.2.3. Drinking motives

Drinking motives for the past month were assessed using the 12-item Drinking Motives Questionnaire-Revised Short Form (DMQ-R SF; Kuntsche & Kuntsche, 2009) at the U.S. sites and the 12-item Spanish version (Spanish DMQ-R SF; Mezquita et al., 2016) at the Spain/Argentina sites. The measure assesses four drinking motive domains on a 5-point response scale (1 = *Almost never/never*, 5 = *Almost always/always*): social, conformity, enhancement, and coping.

#### 2.2.4. Negative alcohol-related consequences

Negative alcohol-related consequences were assessed using the 48-item YAACQ (Read et al., 2006) at the U.S. sites and the 48-item Spanish version at the Argentina/Spain sites (S-YAACQ, Pilatti et al., 2016). Some items were reworded to Castilian Spanish for the Spain site. Each item was scored dichotomously to reflect presence/absence of the alcohol-related problem in the past month (0 = *no*, 1 = *yes*).

#### 2.2.5. Alcohol consumption

Alcohol consumption was measured with the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). Participants were first presented with a visual guide about typical drinks (specific to each country), in order to help orient them to Standard Drink Units (SDUs). To assess the total amount of alcohol consumed during a typical week, the total number of Standard Drink Units (SDUs) consumed (summed) were transformed into grams of alcohol taking into account that one SDU is equivalent to 14 g of alcohol in U.S and Argentina [NIAAA, 2015; International Alliance for Responsible Drinking (IARD), 2016], whereas it is equivalent to 10 g in Spain (Rodríguez-Martos, Gual, & Llopis, 1999; IARD, 2016).

### 2.3. Statistical analysis

To test the proposed models, structural equation modeling using Mplus 7.4 (Muthén & Muthén, 1998–2015) was conducted. In the hypothesized mediation model, we proposed a structural model in which depressive symptoms was examined as a statistical predictor of rumination facets, drinking to cope, and alcohol outcomes. Further, the

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