



## Depressive symptoms are a vulnerability factor for heavy episodic drinking: A short-term, four-wave longitudinal study of undergraduate women



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### HIGHLIGHTS

- ▶ The study included 200 young women studied using a 4-wave, 4-week longitudinal design.
- ▶ Tested reciprocal relations between depressive symptoms and heavy episodic drinking
- ▶ Depressive symptoms influence heavy episodic drinking, but not vice versa.
- ▶ Results support the vulnerability model.

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### ABSTRACT

Heavy episodic drinking is increasingly common among undergraduate women. Cross-sectional research suggests that depressive symptoms and heavy episodic drinking are related. Nonetheless, surprisingly little is known about whether depressive symptoms are an antecedent of heavy episodic drinking, a consequence of heavy episodic drinking, or both. Such knowledge is essential to the accurate conceptualization of heavy episodic drinking, depressive symptoms, and their interrelations. In the present short-term longitudinal study, depressive symptoms and heavy episodic drinking were proposed to reciprocally influence each other over time, with depressive symptoms predicting changes in heavy episodic drinking over 1 week and vice versa. This reciprocal relations model was tested in 200 undergraduate women using a 4-wave, 4-week longitudinal design. Structural equation modeling was used to conduct cross-lagged analyses testing reciprocal relations between depressive symptoms and heavy episodic drinking. Consistent with hypotheses, both depressive symptoms and heavy episodic drinking were temporally stable, and depressive symptoms predicted changes in heavy episodic drinking over 1 week. Contrary to hypotheses, heavy episodic drinking did not predict changes in depressive symptoms over 1 week. Results are consistent with a vulnerability model suggesting depressive symptoms leave undergraduate women vulnerable to heavy episodic drinking. For undergraduate women who are struggling with feelings of sadness, worthlessness, and hopelessness, heavy episodic drinking may provide a temporary yet maladaptive means of avoiding or alleviating depressive symptoms.

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### 1. Introduction

Traditionally, heavy drinking was viewed more as a problem affecting men and as a result, women are underrepresented in theory and research on the heavy drinking (see Stewart, Gavric, & Collins, 2009

for a review). Disturbingly, rates of heavy drinking in young women are increasing, and becoming comparable to those seen in young men (Stewart et al., 2009). In a recent study, nearly two-thirds of undergraduate women reported heavy episodic drinking (consuming 4 or more drinks in 2 h) in a 2 week period—a level consistent with that of undergraduate men (Mushquash et al., in press). Among undergraduate women, heavy episodic drinking is tied to many problems, including physical injury, academic difficulties, unprotected sex, and sexual assault (Perkins, 2002). Given the lack of research specifically focusing on heavy drinking among undergraduate women, their increasing

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rates of heavy episodic drinking, and the accompanying negative outcomes, research clarifying antecedents and consequences of heavy episodic drinking in undergraduate women is needed.

Cross-sectional studies often show that depressive symptoms (e.g., sadness, irritability, fatigue, and sleep problems) and heavy episodic drinking are related (Archie, Zangeneh Kazemi, & Akhtar-Danesh, 2012). However, the temporal relationship between depressive symptoms and heavy episodic drinking among undergraduate women is less clear. In the present study, we conducted a 4-wave, 4-week longitudinal study testing short-term reciprocal relations between depressive symptoms and heavy episodic drinking to clarify the temporal relationship between these variables. We conceptualized and measured depressive symptoms and heavy episodic drinking using dimensional models in which both depressive symptoms and heavy episodic drinking were viewed as lying along a continuum of severity. Next, we review the available literature on the interrelations of depressive symptoms and heavy episodic drinking.

### 1.1. Vulnerability models of depressive symptoms and heavy episodic drinking

Vulnerability models suggest that depressive symptoms come before, and contribute to, heavy episodic drinking. This notion appears in various theories, including the self-medication model (Khantzian, 1997) and affect regulation model (Sher & Grekin, 2007). In general, vulnerability models assert that people with depression use alcohol for its negatively reinforcing properties (Stewart, Grant, Mackie, & Conrod, *in press*). Alcohol may be negatively reinforcing to people with depression since it relieves pain (Stewart & Conrod, 2008) or reduces negative self-awareness (Baumeister, 1991). While this research suggests that depression might be a precursor of alcohol use, less is known about depressive symptoms contributing to heavy episodic drinking specifically. One long-term longitudinal study of young adults does indicate that depressive symptoms (assessed with the Child Behavior Checklist; Achenbach, 1978) confer vulnerability to heavy episodic drinking (defined as the frequency of consuming five drinks in a row during the past year), especially among young women (Chassin, Pitts, & Probst, 2002).

### 1.2. Complication/scar models of depressive symptoms and heavy episodic drinking

In complication/scar models, depressive symptoms are seen as a consequence of heavy episodic drinking rather than a vulnerability for heavy episodic drinking (Schuckit, 2006). Complication models suggest that heavy episodic drinking results in transient, short-term increases in depressive symptoms, whereas scar models suggest that heavy episodic drinking results in permanent increases in depressive symptoms (Bagby, Quilty, & Ryder, 2008). We focus on the complication model as our research design does not allow us to test long-term changes in depressive symptoms. Some authors assert that depression might be alcohol-induced, with alcohol use preceding and producing depressive symptoms (Schuckit, 2006). Moreover, the physiological effects of alcohol use, or negative psychological outcomes associated with alcohol use, might increase depressive symptoms (Swendsen & Merikangas, 2000). While this research focuses on alcohol use and depression, one long-term longitudinal study of adult community members suggests that heavy episodic drinking (estimated by frequency of intoxication, hangovers, and alcohol-induced pass-outs) predicts depressive symptoms (assessed with the Beck Depression Inventory; Beck, Steer, & Garbin, 1988) 5 years later (Paljarvi et al., 2009). Using an experience sampling design in a sample of undergraduates, Hussong, Hicks, Levy, and Curran (2001) also found that heavier drinking on the weekend (based on the number of drinks consumed) predicted greater negative affect (assessed with the Positive and Negative Affect Schedule Expanded Form; Watson & Clark, 1994) during the week.

### 1.3. Reciprocal relations model of depressive symptoms and heavy episodic drinking

The reciprocal relations model (Stewart, Grant, Mackie, & Conrod, *in press*), combines the vulnerability model and the complication model into a single model where depressive symptoms contribute to heavy episodic drinking and heavy episodic drinking contributes to depressive symptoms (see Fig. 1). In this model, depressive symptoms and heavy episodic drinking are seen as co-occurring variables where changes in depressive symptoms are related to changes in heavy episodic drinking and vice versa. Instead of assuming that only unidirectional patterns exist between variables, the reciprocal relationship model tests whether depressive symptoms and heavy episodic drinking exert bidirectional influence on each other over time (see Fig. 1).

### 1.4. Advancing the literature on depressive symptoms and heavy episodic drinking

Knowing if depressive symptoms contribute to heavy episodic drinking, are a result of heavy episodic drinking, or both, is vital to accurately conceptualizing, assessing, and treating undergraduate women who experience depressive symptoms and/or heavy episodic drinking. The reciprocal relations model is a plausible integrative model for explaining relationships between depressive symptoms and heavy episodic drinking. To rigorously test the reciprocal relations model, improvements are needed. Existing studies on depressive symptoms and heavy episodic drinking often rely on cross-sectional designs (e.g., Archie et al., 2012), or long-term longitudinal designs (e.g., Chassin et al., 2002; Paljarvi et al., 2009). Cross-sectional designs fail to address key issues of temporal precedence and long-term longitudinal designs may overlook meaningful short-term relations between variables. A short-term, multi-wave longitudinal design (as used in the present study) tests the interplay between depressive symptoms and heavy episodic drinking and reduces recall bias by measuring events closer to their actual occurrence.

In measuring heavy episodic drinking, researchers often use a single item assessing heavy episodic drinking frequency over a specific time period (e.g., how many heavy episodic drinking episodes occurred over the last week; National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2003). Though this heavy episodic drinking frequency item does capture useful information, some suggest it is insufficient for assessing heavy episodic drinking among undergraduates (White, Kraus, & Swartzwelder, 2006). For example, undergraduates may drink far beyond the threshold for heavy episodic drinking (i.e., far beyond 4 drinks in 2 h), meaning key information on heavy episodic drinking severity is lost when using only a heavy episodic drinking frequency measure. Undergraduates also tend to underestimate the amount (or number) of drinks they consume—creating problems for heavy episodic drinking frequency and severity measures relying on accurate recall of drinks consumed over a specific time period (White, Kraus, McCracken, & Swartzwelder, 2003). Assessing general self-perceptions of heavy episodic drinking (e.g., “I rapidly drank a very large amount of alcohol”) may capture information missed by drink count measures. In the present study, we operationalized heavy episodic drinking using three measures assessing heavy episodic drinking frequency, severity, and self-perceptions. These measures more thoroughly assess how often people engage in heavy episodic drinking, their peak consumption during episodes of heavy episodic drinking, and their perceptions about their heavy episodic drinking. Using multiple measures to create a latent variable also provides more precise estimates by taking measurement error into account and by reducing reliance on the potentially idiosyncratic properties of a single item (Kline, 2005).

### 1.5. Objectives and hypotheses

We tested the reciprocal relations model as it synthesizes the vulnerability model and the complication model. Based on prior research,

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