



## Women who use exercise as a compensatory behavior: How do they differ from those who do not?<sup>☆</sup>



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### ABSTRACT

**Objectives:** This research examined group differences between women who reported using exercise as a compensatory behavior (ECB;  $n = 73$ ) and women who did not report using exercise as a compensatory behavior (NECB;  $n = 133$ ) on alcohol and exercise behavior, drinking and exercise motivation, and several related constructs.

**Design:** A cross-sectional design was used.

**Methods:** Undergraduate women ( $M$  age = 19.5 years,  $SD = 3.01$  years) completed self-report measures regarding their alcohol use, alcohol-related problems, exercise behavior, alcohol and exercise motivations, impulsivity, body dissatisfaction, and dietary restraint.

**Results:** Results indicated that women in the ECB group reported consuming more alcohol, more binge drinking episodes, more alcohol-related problems, higher alcohol and exercise motivations, more exercise, and greater impulsivity, body dissatisfaction, and dietary restraint than women in the NECB group ( $p$ 's ranging from  $<.0001$  to  $.017$ ).

**Conclusions:** Interestingly, women who use exercise as a compensatory behavior consumed higher amounts of alcohol, but did not drink more frequently than women who did not use exercise as a compensatory behavior. Women who use exercise as a compensatory behavior also endorse drinking and exercise motives more strongly than women who did not use exercise as a compensatory behavior.

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### Introduction

Two common behaviors among young adults are exercise and alcohol use (American College Health Association, 2012). Because roughly 40% of college students engage in heavy episodic drinking (Dawson, Grant, Stinson, & Chou, 2004) and alcohol is a calorically-dense beverage (Dennis, Flack, & Davy, 2009), it may be that college students utilize behaviors such as exercise to compensate for the increased caloric intake associated with their alcohol consumption. Recently, researchers have begun to examine the behaviors in which individuals engage in anticipation of and following their alcohol consumption (Bryant, Darkes, & Rahal, 2012; Burke, Cremeens, Vail-Smith, & Woolsey, 2010). This line of research has been referred to by the colloquial term “drunkorexia” and includes

behaviors such as dieting and exercise (Chambers, 2008; Kershaw, 2008).

Prior research has generally supported a positive relationship between exercise behavior and alcohol use (Barry & Piazza-Gardner, 2012; Buscemi, Martens, Murphy, Yurasek, & Smith, 2011; French, Popovici, & Maclean, 2009; Moore & Werch, 2008; Musselman & Rutledge, 2010; Vickers et al., 2004), suggesting that more frequent and intense exercise is associated with greater alcohol consumption. This has been referred to as the ‘incongruous alcohol–activity relationship’ (Musselman & Rutledge, 2010). One explanation might focus on the use of exercise as a compensatory strategy for alcohol consumption (French et al., 2009; Musselman & Rutledge, 2010). Yet, only one study has examined the use of exercise as a compensatory behavior for alcohol consumption. These authors found that roughly 36% of women reported exercising *before* drinking, while 49% reported exercising *after* drinking to compensate for the alcohol-related calories consumed (Bryant et al., 2012).

Extant literature has examined the relationship between exercise and alcohol use prospectively. One study (Terry-McElrath & O'Malley, 2011) examined trajectories of exercise behavior and

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substance use over time using a nationally representative sample. These authors found that higher levels of physical activity were associated with more frequent alcohol use among 18 year olds. However, there were no differences in the rate of trajectory growth for exercise and alcohol use between the ages of 18 to 22. Meanwhile, among those between the ages of 22 to 26, there was a decrease in the prevalence of these behaviors over this period of time. In addition, Harkabus (2012) examined the relationships between exercise and alcohol use prospectively in a sample of undergraduates using a daily diary design. Participants were instructed to complete an online survey once a day for three weeks by reporting their physical activity and alcohol consumption for the previous day. This study found a negative relationship between overall physical activity and alcohol consumption and between vigorous exercise and alcohol use. Meanwhile, there was a positive relationship between moderate exercise and alcohol consumption suggesting that moderate exercise is associated with consuming more drinks.

Several factors may explain why women might engage in exercise as a compensatory strategy for alcohol consumption. First, research has suggested that concerns with appearance may explain the relationship between exercise and alcohol consumption (Vickers et al., 2004). Body dissatisfaction, defined as the negative and dysfunctional beliefs and feelings about one's shape and weight (Garner, 2002), is so common among women it has been referred to as a "normative discontent" (Rodin, Silberstein, & Striegel-Moore, 1985). Body dissatisfaction is a major risk factor for eating psychopathology (Stice, 2002). Due to body dissatisfaction, women may be more likely to use compensatory strategies such as exercise and chronic dieting after consuming alcohol. Moreover, to the extent that these women are experiencing caloric deficits more generally due to either restriction or exercise, they may be at a greater risk for alcohol-related problems (Buchholz, Williams, & Crowther, 2012), such as academic problems, legal problems, and risky sexual behaviors (e.g., Perkins, 2002).

Apart from the increased likelihood of experiencing problems after drinking due to caloric deficits, another factor that is related to increased problems is impulsivity. Impulsivity is a multi-faceted construct that has important associations with eating pathology (Fischer, Smith, & Cyders, 2008). One facet of impulsivity is negative urgency, defined as the "tendency to act rashly when experiencing a negative mood." Other facets of impulsivity include disinhibition, or the inability to delay gratification, and sensation seeking which is the "tendency to seek out novel and thrilling sensations." Given that impulsivity is associated with greater alcohol consumption over time (Quinn, Stappenbeck, & Fromme, 2011), women who use exercise as a compensatory behavior may have higher impulsivity since these women are likely to use exercise as a means of reestablishing control after drinking.

It also may be important to consider the role of drinking and exercise motives. One question that can be raised is whether women who use exercise as a compensatory strategy drink and exercise for different reasons than women who do not. Research has identified two types of drinking motives: conformity and social reasons, which are considered positively reinforcing; and coping and mood enhancement, which are considered negatively reinforcing (Martens, Rocha, Martin, & Serrao, 2008). Prospective research has found that drinking motives are positively related to subsequent alcohol consumption and problems (Anderson, Briggs, & White, 2013). It may be that coping and mood enhancement are more salient drinking motives among women who use exercise as a compensatory strategy. Given that these women use exercise to cope with the excess calories consumed while drinking, they may be more likely to use alcohol as a coping strategy for their negative affect. Because weight and appearance concerns are associated

with the use of compensatory strategies (Fairburn, 2008), women who use exercise as a compensatory behavior may be more likely to exercise for weight and appearance concerns rather than health and fitness.

The purpose of this study was to examine group differences between women who report using exercise as a compensatory behavior for alcohol consumption (ECB) versus women who do not report using exercise as a compensatory behavior for alcohol consumption (NECB) on several conceptually-grouped dependent variables. First, group differences on various alcohol indices, including drinking quantity, drinking frequency, and whether or not a woman binge drank, were examined. Second, group differences on alcohol and exercise motivations were examined. Lastly, group differences on several associated correlates, such as alcohol-related problems, impulsivity, dietary restraint, total exercise, and body dissatisfaction, were examined.

This study will assist with better understanding the constellation of characteristics associated with women who use exercise as a compensatory behavior. In addition, this study will aid future research by identifying women who are at risk for subsequent maladaptive behaviors. By examining women's motivations for drinking and exercising, clinicians and researchers will be able to tailor existing interventions to this group of women.

## Methods

### Participants

Participants were recruited from a larger pool of 1785 undergraduate women through an online mass testing survey. To be eligible for this study, participants had to be female, at least 18 years old, and report consuming at least one drink in the past month on the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). Eligible participants ( $N = 318$ ) were invited to participate in a study on alcohol and other health-related behaviors. Of the 318 women screened, 206 (64.8%) provided complete data on the variables of interest. Ten women were excluded from analyses since they did not indicate whether or not they used exercise as a compensatory behavior for alcohol consumption, 42 women were excluded due to missing data on the variables used to calculate body mass index (BMI), 21 women were excluded since they did not provide sufficient data to calculate the number of drinks consumed, and three women were excluded due to questions regarding the validity of their data to calculate alcohol problems (i.e., Rutgers Alcohol Problems Index  $> 30$ ). In addition, 36 individuals were removed due to substantial missing data on the constructs of interest (i.e.,  $>10\%$  of total items) ( $n = 2$  for the Drinking Motives Questionnaire;  $n = 13$  for Eysenck I7 Questionnaire;  $n = 2$  for the Function of Exercise Scale;  $n = 19$  for Revised Restraint Scale), resulting in a final sample of  $N = 206$  women.

Women were, on average, 19.5 years old ( $SD = 3.01$ ) and had an average BMI of 23.0 ( $SD = 4.54$ ). The majority were Caucasian ( $n = 181, 87.9\%$ ), followed by African American ( $n = 9, 4.4\%$ ), Hispanic ( $n = 4, 1.9\%$ ), Asian ( $n = 3, 1.5\%$ ), and other ( $n = 1, .5\%$ ). Eight individuals (3.9%) did not indicate their ethnicity.

Two self-report items were written by the first author (LJB) to determine whether women use exercise as a compensatory behavior before and/or after drinking alcohol. Thus, women answered "yes" or "no" to the following questions: "do you exercise *before* a drinking episode in order to 'reserve' these calories for your intended alcohol consumption" and "do you exercise *after* a drinking episode in order to remove the calories you consumed from drinking alcohol?" Women were placed in the exercise as a compensatory behavior (ECB;  $n = 73$ ) group if they endorsed "yes" to at least one item, while women were placed in the no exercise as

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