Exploring differential patterns of situational risk for binge eating and heavy drinking

Cheryl D. Birch a,⁎, Sherry H. Stewart a, Catrina G. Brown b

a Dalhousie University, Psychology Department, 1355 Oxford Street, Halifax, Nova Scotia, Canada B3H 4J1
b Dalhousie University, School of Social Work, 6414 Coburg Street, Halifax, Nova Scotia, Canada B3H 3J5

Abstract

This study was designed to compare risk situations for binge eating vs. heavy drinking among women who struggle with both problems. Participants were 41 women in treatment for an alcohol problem who also self-reported binge eating. Participants completed the Inventory of Binge Eating Situations (IBES; [Baker, J. M. (1998). Binge eating and binge drinking among university women. Unpublished master’s thesis, Department of Psychology, Queen’s University, Kingston, Ontario, Canada]) and the Inventory of Drinking Situations (IDS-42; [Annis, H. M., Graham, J. M., & Davis, C. S. (1987). Inventory of Drinking Situations (IDS) user’s guide. Toronto, Canada: Addiction Research Foundation]) to measure frequency of binge eating and heavy drinking, respectively, in eight categories of situations. A 2 (substance) × 8 (situation) repeated measures ANOVA revealed a significant substance × situation interaction. Further exploration of this interaction indicated that heavy drinking is more likely than binge eating to occur in reward and interpersonal situations involving pleasant emotions, pleasant times with others, social pressure, and conflict with others. In contrast, binge eating and heavy drinking are equally likely to occur in relief situations involving unpleasant emotions, and physical discomfort, as well as in situations involving urges and temptations, and testing control. Implications of findings for the treatment of co-occurring binge eating and heavy drinking in women are discussed.

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⁎ Corresponding author. Present Address: 1011-61 Richview Road, Toronto, Ontario, Canada M9A 4M8. Tel.: +1 647 340 4480.
E-mail address: cdbirch@dal.ca (C.D. Birch).

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1. Exploring differential patterns of situational risk for binge eating and heavy drinking

In recent years there has been growing awareness and concern about the common co-occurrence of eating and substance use problems. Several reviews document that this co-occurrence is particularly likely among women, and if the eating problems reported involve a pattern of binge eating (e.g., bulimia nervosa, binge eating/purging subtype of anorexia nervosa) (cf. Goldbloom, 1993; Holderness, Brooks-Gunn, & Warren, 1994; Krahn, 1991; Singer, Nutter, White, & Song 1993; Sinha & O’Malley, 2000; Stewart & Brown, in press-a; Wilson, 1993).

Precise estimates of co-prevalence vary in the literature as a function of how eating and substance use problems are measured, and further research is needed. Nevertheless, there is compelling evidence available thus far suggesting that substance use problems are highly prevalent among women with eating disorders, and conversely, that eating disorders are highly prevalent among women with substance use disorders. Data from one large review indicates, for example, that up to 13% of women with the restricting subtype of anorexia, 48.6% with bulimia, and 39% with a lifetime history of both bulimia and anorexia (or the binge/purge subtype of anorexia) also struggle with substance use disorders (Holderness et al., 1994). In terms of alcohol use disorders specifically, one large study found that 16.8% of women with the restricting subtype of anorexia, 46.1% with bulimia, and 37.8% with a lifetime history of both anorexia and bulimia (or the binge/purge subtype of anorexia) also have an alcohol use disorder (Bulik et al., 2004). Even the lowest estimates of the prevalence of substance use disorders among women with eating disorders are substantially higher than the 6.2% prevalence rate of substance use disorders among women in the general population (Substance Abuse & Mental Health Services Administration, 2005). Conversely, data from the Holderness et al. review also indicate that a respective 40.7% and 10% of women with substance use disorders are estimated to have bulimia and anorexia. Again, this prevalence rate greatly exceeds the population base rates of 1% and 0.3% for bulimia and anorexia, respectively (Hoek & van Hoeken, 2003). While there is little data about the co-occurrence of eating and substance use problems among men, one recent study indicates that 8% of men (and 25% of women) seeking treatment for a substance use disorder also have an eating disorder (Courbasson, Smith, & Cleland, 2005). Data from community samples (e.g., Kendler et al., 1991) also support the common co-existence of eating and substance use problems, and this suggests that high co-prevalence rates among clinical samples are not merely inflated due to the tendency for those with more than one psychological problem to seek treatment (i.e., ‘Berkson’s bias’). Overall, there is good evidence that eating and substance use problems commonly co-occur. Further large-scale research is needed, however, to investigate all of the different types of eating and substance use disorders, and to include male respondents, community samples, as well as an examination of sub-threshold cases.

There are many theoretical explanations for why eating problems and substance use disorders, like alcohol abuse and dependence, co-occur. As both of these disorders tend to co-occur in families some suggest that genetic and/or biological factors play a role; others emphasize that the social aspects of the family environment (e.g., modelling, dysfunctional family interactions) contribute to the risk for the co-occurrence of these disorders (cf. Goldbloom, 1993; Sinha & O’Malley, 2000; Stewart & Brown, in press-a). Other social factors, such as a history of traumatic experiences or abuse, might also play a role in the development of co-occurring eating and drinking regulation difficulties (cf. Deep, Lilenfeld, Plotnicov, Pollice, & Kaye, 1999; Stewart & Brown, in press-a,b).

Some explanations for the co-occurrence of eating and alcohol problems are more psychological in nature, and some suggest that one problem is causally related to the development of the other problem.
These problems may co-occur, for example, because they are both expressions of the same impulsive personality tendencies (cf. Battaglia, Pryzbeck, Bellodi, & Cloninger, 1996; Goldbloom, 1993; Holderness et al., 1994; Stewart & Brown, in press-a), or restrained behavioural patterns. With respect to the latter, when an individual shows cyclical patterns of restriction–disinhibition (i.e., ‘restraint’ cf. Collins, 1993; Polivy & Herman, 1985) with one substance, they may be more likely to develop the same restraint behaviours with another substance (cf. Ricciardelli & Williams, 1997; Stewart, Angelopoulos, Baker, & Boland, 2000). One problem could also have developed as a consequence of trying to restrain or cope with the other problem (e.g., an individual drinks to avoid eating and achieve weight loss, or they eat to avoid drinking) (cf. Krahn, 1991). The inhibition-lowering or appetite-stimulating effects of alcohol may also directly “cause” excessive eating for some individuals (cf. Abraham & Beaumont, 1982; Caton, Ball, Ahern, & Heatherington, 2004; Foltin, Fischman, & Byrne, 1988; Giannini et al., 1998; Polivy & Herman, 1976; Williamson, 1990). In contrast, the physiological deprivation associated with eating problems, or the dysphoria linked to binge eating or malnutrition might lead to or “cause” problematic alcohol-seeking to achieve physical or emotional satiety, respectively (cf. Bulik et al., 1992; Carr, 2002; Krahn, 1991; Mitchell, Hatsuakami, Eckert, & Pyle, 1985; Pollice, Kaye, Greeno, & Weltzin, 1997; Wiederman & Pryor, 1996). Along the same lines, eating and alcohol problems may co-occur because they serve a similar function. For example, some women may engage in both behaviours because they have not learned more adaptive strategies to obtain emotional rewards (i.e., enhance positive affect) (cf. Stewart & Brown, in press-b), whereas other women may engage in both behaviours because they have not learned more adaptive strategies to obtain emotional relief (i.e., relieve negative affect) (cf. Goldbloom, 1993; Stewart & Brown, in press-b).

One way to compare the function of co-occurring eating and alcohol problems is to examine similarities and differences between the respective situational contexts that give rise to these behaviours. For, at least in the case of heavy drinking, it has been suggested that the underlying motivations for this behaviour can be inferred from the situations in which the behaviour occurs (Stewart, Samoluk, Conrod, Pihl, & Dongier, 2000). Overall, it is useful to obtain information about the similarities and differences in both the functions and situational contexts for co-occurring eating and alcohol problems because this information can yield further insight about why these behaviours commonly co-occur, and about how to best treat this co-occurrence.

There have been very few studies conducted to compare the functions and/or situational contexts for eating and substance use problems among individuals with both problems. Filstead, Parrella, and Ebbit (1988) examined the situational contexts for binge eating and heavy drinking or other heavy drug use among individuals (78% women) who were receiving concurrent treatment for alcohol/substance abuse or dependence, as well as bulimia. They administered a modified Inventory of Drinking Situations (IDS; Annis, Graham, & Davis, 1987) to identify typical high risk situations for heavy substance use, and they also administered an author-modified version of the IDS to identify typical high risk situations for binge eating. They found that there was a significantly different level of risk for binge eating vs. heavy drinking/substance use in three of the eight risk situations measured. Specifically, heavy substance use was more likely than binge eating to occur in situations involving social pressure and pleasant times with others, whereas binge eating was more likely than heavy substance use to occur in situations involving urges or temptations.

While the Filstead et al. (1988) study is an important first analysis of risk situations for co-occurring binge eating and heavy substance use, it left several important areas for further research. Further research could focus on comparing the situations for co-occurring binge eating and heavy alcohol use in particular
because the risk situations for the use of different drugs may differ substantially (cf. Ross, Filstead, Parrella, & Rossi, 1994). Filstead et al. also studied individuals who met the full criteria for a clinical diagnosis of bulimia and substance abuse or dependence. Research based on a continuum perspective, however, clearly indicates that only a small minority of individuals who experience eating difficulties (e.g., Brown, 1993; Garner, Olmstead, & Garfinkel, 1983) or substance-related problems (e.g., Sobell & Sobell, 1993) have symptoms that are severe enough to warrant a clinical diagnosis. Unfortunately, the difficulties experienced by the many individuals who struggle with a subthreshold level of symptoms have not been well characterized in the literature, and as a result these individuals likely “fall through the cracks” and have limited access to appropriate health services. Thus, further research with individuals who do not necessarily represent the extreme ends of the continuum for eating and/or drinking problems is important to improve the generalizability and clinical utility of results. Finally, unlike in the Filstead et al. study, further research should also be conducted only with women, to reduce the variability due to gender, as eating and alcohol problems co-occur much more frequently among women than men.

A study conducted by Stewart, Brown, Devoulyte, Theakston, and Larsen (2006) addresses some of the needs for further research stemming from the Filstead et al. (1988) study. The sample of interest from this study was comprised of women who were seeking treatment for an alcohol problem, and who self-reported binge eating on the Binge Scale (cf. Hawkins & Clement, 1980). The Binge Scale is a thorough screener for the symptoms of binge eating according to research criteria outlined in the DSM-IV-TR (e.g., excessive eating in a discrete period of time, perceived dyscontrol while eating, distress regarding binge eating) (APA, 2000). Stewart et al. administered both the Inventory of Binge Eating Situations (IBES; Baker, 1998) and the 42-item IDS (IDS-42; Annis et al., 1987), to assess situations for binge eating and heavy drinking respectively. In scoring the IDS-42 they collapsed the eight risk situation subscale scores to obtain the three higher-order subscale scores as follows: (1) a positive reinforcement or “reward” score, (2) a negative reinforcement or “relief” score, and (3) a temptation score (cf. Stewart, Angelopoulos et al., 2000; Stewart, Samoluk et al., 2000). They measured whether these IDS higher-order scores predicted similar scores on the IBES, and found that the score measuring frequency of heavy drinking in reward situations was the only significant, independent IDS score to predict frequency of binge eating in reward situations. Similarly, they found that the score measuring frequency of heavy drinking in relief situations was the only significant, independent IDS score to predict frequency of binge eating in relief situations. Thus, these results suggest a correspondence between the situations for binge eating and heavy drinking, and they also suggest that there may be separate groups of women who engage in these behaviours for differing reward vs. relief reasons (see also Stewart & Brown, in press-b).

Further analysis of this data, however, appears warranted. First, the Stewart et al. (2006) study only included a comparison of higher-order (and not lower-order) situations for binge eating and heavy drinking, as measured by the IBES (Baker, 1998) and the IDS-42 (Annis et al., 1987), respectively. As well, the exclusive focus in the Stewart et al. study on what binge eating and heavy drinking have in common, in terms of similar underlying motivations, did not permit an examination of what distinguishes these two behaviours (e.g., the specific contexts in which each behaviour occurs might differ substantially; cf. Stewart & Brown, in press-b). So while it is informative that there is a co-varying tendency to binge eat and drink heavily in similar reward and relief situations, respectively, the Stewart et al. study did not indicate how frequently binge eating vs. heavy drinking actually occurs in the various situations measured. Thus, the important purpose of the present study was to characterize the differences in how commonly binge eating vs. heavy drinking occurs, overall, in the specific lower- and higher-order risk situations that are measured by the IBES and IDS-42. While the present study was exploratory in
nature, we anticipated we would at least obtain evidence consistent with the Filstead et al. (1988) study indicating that heavy drinking is more likely than binge eating in interpersonal situations, such as those involving social pressure or pleasant times with others.

2. Method

2.1. Participants

In the previously mentioned Stewart et al. (2006) study, the sample was comprised of 58 adult women who were receiving treatment for an alcohol use disorder in one of two outpatient programs or an inpatient program, run by Addictions Prevention and Treatment Services in Nova Scotia, Canada. A full 71% (n=41) of the Stewart et al. alcohol treatment sample also self-identified themselves as binge eaters on the Binge Scale (Hawkins & Clement, 1980). It was only the data provided by this sub-sample of women, who reported both binge eating and alcohol problems in the Stewart et al. study, which was analysed in this present study.

Demographic characteristics for this sample of 41 participants are reported below. The age for participants ranged from 19 to 52 years, with an average age of 36.5 years. The vast majority of participants were Caucasian (92.7%). In terms of education, a majority (51.2%) had obtained high school or less, and 26.9% had completed at least some studies at a university-level. The majority (65.9%) were unemployed at the time of their participation, and among those who were working, 91.9% reported that they made less than $35000 CDN per annum. As well, most participants (62.2%) stated they were not currently involved in a romantic relationship (dating, co-habitating, or married), and a majority (70.7%) reported that they had children.

As would be expected in an alcohol treatment sample, all participants scored above the clinical cutpoint (i.e., score of 6 or higher) on the Brief Michigan Alcoholism Screening Test (B-MAST; Pokorn, Miller, & Kaplan, 1972). Also as expected, they endorsed a pattern of frequent and heavy drinking. On average, participants reported drinking 5.4 (S.D. = 2.2) times per week and consuming 10.5 (S.D. = 10.9) standard alcoholic drinks on each drinking occasion.

On the basis of responses to the Binge Scale (Hawkins & Clement, 1980), the vast majority of participants (90.2%) could be considered to have a “severe” problem with binge eating (Vanderehyden & Boland, 1987). As well, 85.4% said they had been binge eating for more than three months, and 48.7% said they binged at least once a week. With respect to core features of binge eating (cf. APA, 2000; Wilson, 1993), 61.0% said they eat very rapidly during a binge, 63.5% gave responses suggesting they binged until they were overly satiated, 83.0% said they felt at least some degree of impaired control during a binge, and 90.3% reported feeling depressed after a binge. Substantial proportions of these women had tried various weight control strategies: 73.2% reported fasting, 48.8% excessive exercise, 41.5% laxatives, and 22% diuretics.

2.2. Materials

2.2.1. Demographics questionnaire

This author-compiled measure queried about participants’ demographic characteristics and typical alcohol use. Annual income was coded on a 10-point scale with anchors of 1 =$10,000 or less (CDN) per
annum and 10=$50000 or more (CDN) per annum. Quantity-frequency methods were employed to assess typical alcohol use within the past year of participants’ active drinking.

### 2.2.2. Brief Michigan Alcoholism Screening Test (B-MAST; Pokorny et al., 1972)

The B-MAST is a shortened version of the Michigan Alcoholism Screening Test (MAST; Selzer, 1971), and it can reliably distinguish individuals with a known alcohol use disorder (Pokorny et al.). Participants answer “yes” or “no” to 10 questions about their drinking. Responses to three items on the B-MAST are assigned a dichotomous score of either 0 or 5, and the remaining responses are assigned a dichotomous score of either 0 or 2. Thus, total scores range from 0 to 29, and a score of 6 or more is thought to indicate a probable alcohol use disorder. The internal consistency of the B-MAST was satisfactory in this study (Cronbach’s alpha=0.70).

### 2.2.3. Binge Scale (Hawkins & Clement, 1980)

This 12-item scale was administered to screen for, and assess the severity of, binge eating. The Binge Scale screens for symptoms of binge eating as they are outlined in the research criteria of the DSM-IV-TR (APA, 2000). Binge eating is defined for the respondent in the instructions of the questionnaire as “periods of excessive eating in a very short time”. All items are in a multiple-choice format, with possible scores for each response ranging from a minimum of 0 to a maximum of 4. Total scores with cutoffs of 1 to 5, 6 to 9, or of 10 or more can be classified as an indicator of a mild, moderate, or severe pattern of binge eating, respectively (Vandereheyden & Boland, 1987). The psychometric properties of the Binge Scale have been previously reported as acceptable (cf. Hawkins and Clement), and the internal consistency of the scale was adequate in this study (Cronbach’s alpha=0.79).

### 2.2.4. Inventory of Drinking Situations (IDS-42; Annis et al., 1987)

For the IDS-42, participants rate their frequency of heavy drinking (defined as “drinking four or more drinks at one time”) in eight categories of situations during the year prior to their entry into treatment. These eight lower-order situations were also collapsed into three higher-order situations (cf. Carrigan, Samoluk, & Stewart, 1998; Stewart, Samoluk et al., 2000). First, the average frequency of heavy drinking in situations involving unpleasant emotions, physical discomfort, and conflict with others was measured to reflect the tendency to drink in situations in which alcohol may be negatively reinforcing, or serve a relief function. Second, the frequency of heavy drinking in situations involving pleasant times with others, pleasant emotions, and social pressure reflects the tendency to drink in situations in which alcohol may be positively reinforcing, or serve a reward function. Third, the frequency of heavy drinking in situations that involve testing personal control over drinking, and urges and temptations reflects the tendency to drink in temptation situations. A different number of items comprise each subscale, and for each item participants are asked to make ratings on a scale of 1 (almost never/never drank heavily in that situation) to 4 (almost always drank heavily in that situation). Lower-order problem index subscale scores were computed, to enable comparisons across subscales, by dividing the total subscale score (sum of items) by the maximum possible total for that subscale, and multiplying by 100. Higher-order problem index scores are the average of the relevant lower-order problem index scores. The IDS-42 has been shown to possess excellent psychometric properties (e.g., Annis et al.; Carrigan et al.; Stewart, Samoluk, et al.). In this study the internal consistencies were acceptable to excellent, with an average subscale alpha of 0.83 (range 0.69–0.92).
2.2.5. Inventory of Binge Eating Situations (IBES; Baker, 1998)

For the IBES, IDS-42 items were re-worded to inquire about the frequency of binge eating (defined as “excessive eating in a very short time”) in the same categories of lower- and higher-order situations that are measured by the IDS-42. Only 10 IDS-42 items were reworded in constructing the IBES, as most items have no reference to a specific substance. The rating scales and scoring were the same for the IBES as the IDS-42. Exploratory factor analysis attests to the structural validity of the IBES, with subscale items loading on the appropriate factors (Baker, 1998). The internal consistencies of the IBES in this study were acceptable to excellent with an average subscale alpha of 0.78 (range 0.61–0.93).

2.3. Procedure

As mentioned, participants for this present study were selected from the larger sample of women who were receiving treatment for an alcohol problem (Stewart et al., 2006) and were recruited from one of three programs run by Addiction Prevention and Treatment Services within the Capital District Health Authority of Nova Scotia, Canada. All programs were guided by a harm reduction treatment philosophy. The women recruited were at different stages in their treatment. Recruitment methods included invitations extended by experimenters during open groups, letters, posters, verbal referrals by staff members aware of the research, and client-to-client word of mouth. Experimenters explained they were inviting the participation of all women who were receiving treatment for an alcohol problem. They provided a brief description of the study, and stated that one goal of the research was to examine relations between binge eating and heavy drinking. Potential participants were assured that participation was completely voluntary, would in no way affect their treatment, and that all of their responses would remain strictly confidential. The women who were recruited provided informed consent to participate and completed questionnaires in a group setting. They were compensated $15 to offset the costs of childcare or transportation that could have resulted from their involvement in this study. Qualitative interview data was also provided by 18 participants, and this data is reported elsewhere (Stewart et al., 2006).

3. Results

3.1. Lower-order situations for binge eating vs. heavy drinking

Patterns of situational risk for binge eating and heavy drinking were first compared by computing a 2 (substance: food vs. alcohol)×8 (lower-order situation: unpleasant emotions, physical discomfort, pleasant emotions, testing personal control, urges and temptations, conflict with others, social pressure, pleasant times with others) repeated measures Analysis of Variance (ANOVA) on the lower-order problem index subscale scores of the IBES (Baker, 1998) and the IDS-42 (Annis et al., 1987). It revealed significant main effects of substance ($F(1, 40)=32.2, p<.0005$) and situation ($F(7, 280)=15.1, p<.0005$), as well as a significant substance × situation interaction ($F(7, 280)=7.8, p<.0005$). The main effect of substance indicates that the lower-order scores, overall, are higher for heavy drinking than binge eating, which is not surprising for an alcohol treatment sample.

As we conducted multiple post hoc contrasts we always used a conservative, Bonferroni-adjusted alpha level of 0.001 (i.e., 0.05/33 comparisons). We computed several dependent samples $t$-tests and found four significant differences when testing the simple effects of substance for each lower-order risk situation.
separately. Heavy drinking was more likely than binge eating to occur in four of the risk situations as follows: pleasant times with others \((t (40) = 8.8, p < .0005)\), social pressure \((t (40) = 5.9, p < .0005)\), conflict with others \((t (40) = 4.3, p < .0005)\), and pleasant emotions \((t (40) = 4.0, p < .0005)\). Heavy drinking and binge eating were equally likely to occur in situations involving unpleasant emotions \((t (40) = 3.0)\), testing personal control \((t (40) = 2.8)\), physical discomfort \((t (40) = 2.1)\), and urges and temptations \((t (40) = 1.0)\).

The simple effects of the lower-order situations were significant for both binge eating \((F (7, 280) = 12.4, p < .0005)\), and heavy drinking \((F (7, 280) = 12.3, p < .0005)\), indicating there are significant differences in the risk, for both binge eating and heavy drinking, posed by the various situations overall. To further explore these differences, we first ranked the situations from those that are most likely to those least likely to give rise to binge eating and heavy drinking, respectively. See Table 1 for this ranking of the lower-order risk situations for both binge eating and heavy drinking, as well as for problem index subscale means and standard deviations. Next, dependent samples \(t\)-tests were conducted to compare adjacent means in the ranked data for both substances separately. However, none of the differences between adjacent lower-order risk situation problem index subscale means in the ranked data were large enough to be statistically significant (all \(p’s > .001\)).

### 3.2. Higher-order situations for binge eating vs. heavy drinking

Next we compared situations for binge eating and heavy drinking by computing a 2 (substance)×3 (higher-order situation) repeated measures ANOVA on the higher-order problem index scores. This analysis revealed a significant main effect of substance \((F (1, 40) = 27.0, p < .0005)\), and a significant substance×situation interaction \((F (2, 80) = 11.8, p < .0005)\), though the situation main effect was not significant \((F (2, 80) = 0.3)\). Similar to results from above, the substance effect indicates that the higher-order situational risk scores, overall, were higher for heavy drinking than binge eating, which is again not surprising for an alcohol treatment sample.

We found two significant differences when testing the simple effects of substance for each higher-order risk situation separately. Heavy drinking was more likely than binge eating to occur in situations that offer the potential for reward \((t (40) = 7.5, p < .0005)\), and in situations that offer the potential for relief \((t (40) = 3.7, p < .001)\), though binge eating and heavy drinking were equally likely to occur in temptation situations \((t (40) = 2.1)\).
The simple effects of the higher-order situations were not significant for either binge eating ($F(2, 80)=6.4$), or heavy drinking ($F(2, 80)=3.2$) indicating that the differences in the risk for both behaviours, posed by the higher-order situations, overall, are not large enough to be statistically significant. See Table 2 for a ranking of the higher-order risk situations for both binge eating and heavy drinking, as well as for problem index subscale means and standard deviations. Nevertheless, exploratory dependent-samples $t$-tests were conducted to compare adjacent means in the ranked data for both behaviours separately. There was one significant difference found. Binge eating was most likely to occur in relief situations, then in temptation situations, and least likely to occur in reward situations. This latter difference, indicating that binge eating was more likely to occur in temptation than reward situations, was statistically significant ($t(40)=3.6, p<.001$). In contrast, there were no statistically significant differences in the likelihood of heavy drinking occurring across the three higher-order situations.

4. Discussion

The results from the present study indicate that there are both similarities and differences in the risk situations for binge eating and heavy drinking among women who struggle with binge eating problems that may be sub-clinical in severity, and that co-occur with heavy drinking. Results from analyses of lower-order IBES (Baker, 1998) and IDS-42 (Annis et al., 1987) subscale scores indicate that heavy drinking is more likely than binge eating to occur in the three situations that together reflect the tendency to drink in situations that involve the potential for emotional reward (i.e., situations involving pleasant times with others, social pressure or social cues, and pleasant emotions) (cf. Carrigan et al., 1998). Heavy drinking is also more likely than binge eating to occur in one of the three situations that reflect a tendency to use the substance in situations that involve the potential for emotional relief (i.e., situations involving conflict with others). Interestingly, this “conflict with others” situation is an interpersonal situation and, as such, it is conceptually associated with two of the other three situations that pose an increased risk for heavy drinking as compared to binge eating (i.e., situations involving pleasant times with others and social pressure). Thus, heavy drinking is more likely than binge eating to occur in all of the reward and interpersonal situations measured in this study. Binge eating and heavy drinking are equally likely to occur in the other situations measured that do not directly involve interpersonal interaction (i.e., in relief situations involving unpleasant emotions and physical discomfort, as well as in the temptation situations involving urges and temptations and testing control, respectively).

Analyses of higher-order subscales largely corroborate these first findings. Heavy drinking was more likely than binge eating to occur in reward and relief situations. Analyses of lower-order subscales

<table>
<thead>
<tr>
<th>Rank</th>
<th>Behaviour</th>
<th>Binge eating (S.D.)</th>
<th>Heavy drinking (S.D.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Relief</td>
<td>59.0 (13.7)</td>
<td>Reward 71.2 (18.1)</td>
</tr>
<tr>
<td>2</td>
<td>Temptation</td>
<td>58.5 (15.0)</td>
<td>Relief 67.2 (15.3)</td>
</tr>
<tr>
<td>3</td>
<td>Reward</td>
<td>52.5 (16.7)</td>
<td>Temptation 65.3 (19.6)</td>
</tr>
</tbody>
</table>
suggest, however, that this latter finding may largely be explainable by the increased likelihood of heavy drinking as compared to binge eating in the relief situation of conflict with others, specifically. Analyses of higher-order subscales also indicate that binge eating is more likely to occur in relief and temptation situations, than reward situations. In contrast, none of the higher-order situations pose a greater hierarchical risk for heavy drinking.

The results from this present study can be used to help interpret, and qualify the implications of, results obtained from initial analyses conducted on this same data set (cf. Stewart et al., 2006). For example, Stewart et al. found that the frequency of reward situation heavy drinking predicts the frequency of reward situation binge eating, but the present study indicates that the likelihood of binge eating occurring in reward situations is, in actuality, quite low. The present study indicates that heavy drinking is more likely than binge eating to occur in reward situations, and that binge eating, overall, is more likely to occur in relief and temptation (rather than reward) situations. With respect to the Stewart et al. finding that relief situation heavy drinking predicts relief situation binge eating, supplementary findings from the present study indicate that both binge eating and heavy drinking are likely to occur in relief situations (e.g., both were equally likely, and most likely, to occur in situations involving unpleasant emotions).

Consistent with what was hypothesized, findings from the present study are very comparable to findings from the only other study conducted to date, of which we are aware, that has examined risk situations for binge eating vs. heavy drinking or drug use, specifically among individuals with both problems. Filstead et al. (1988) concluded that heavy drug use (including alcohol use) was more likely than binge eating to occur in interpersonal situations involving pleasant times with others and social pressure. Findings from the present study corroborate these results, and indicate that heavy drinking vs. binge eating is also more likely to occur in the only other interpersonal situation (i.e., situations involving conflict with others) measured by the similar questionnaires administered in both studies. Contrary to the present study, Filstead et al. did not find that heavy drug use is more likely than binge eating in situations involving pleasant emotions. Thus, the present study provides slightly more conclusive evidence that heavy drinking is more likely than binge eating in reward situations. Both studies also provide comparable evidence of similarities in some situations for binge eating and heavy drug use.

Differences between findings from these two studies may be attributable to differences in the two samples tested, and to the fact that Filstead et al. (1988) measured risk situations for heavy use of all types of substances whereas we focused on risk situations for heavy drinking, in particular. There are, however, more similarities than differences between findings from the two studies. Overall, they both suggest that binge eating, when assessed separately, and relative to heavy drinking (or other heavy substance use), seems unlikely to occur in interpersonal and reward situations. Also of note, is that the separate hierarchical ranking of risk situation scores for binge eating and heavy drinking or drug use, respectively, is strikingly similar across the two studies, and that in both studies the most common risk situations for both behaviours involve unpleasant emotions. These commonalities between findings from the two studies suggest that the Filstead et al. results, obtained from a sample of inpatients with co-occurring bulimia and substance use disorders, can be generalized to women whose binge eating and/or heavy drinking problem is not necessarily severe enough to be recognized as a diagnosable eating and/or alcohol use disorder.

Binge eating may be less likely to occur in positive or social contexts in our culture than heavy drinking because it is more socially acceptable, and sanctioned in celebratory contexts, to drink alcohol rather than eat to excess (or in a rapid and uncontrolled manner). Qualitative interview data collected from the same participants as in the present study (see Stewart et al., 2006 for a report of this data), and supplementary
data from the Filstead et al. (1988) study support this hypothesis. Stewart and Brown (in press-b) note that binge eating was typically reported to occur in solitary contexts as women felt it more socially acceptable to drink heavily than binge eat in public. Similarly, Filstead et al. found that 70% of their sample reported binge eating in private, though they did not measure how often heavy substance use occurs in private.

Findings from previous research conducted to examine binge eating and/or heavy drinking separately (among individuals who do not necessarily experience a co-occurrence of these problems) are also consistent with findings from the present study that binge eating (but not heavy drinking) is unlikely in positive and social contexts, perhaps because it is socially unacceptable. The DSM-IV-TR (APA, 2000) notes that binge eating often occurs alone due to embarrassment about the quantity of food consumed. Likewise, Heatherton and Baumeister (1991) review evidence that being observed discourages disinhibited eating, and promotes conformity with societal norms for eating self-restraint. Crowther, Lingswiler, and Stephens (1984) conducted a prospective research study and found that binge eating was likely to occur in non-food-related, non-public settings. Cummings, Gordon, and Marlatt (1980) found that a relapse to overeating, among participants in a weight reduction program, was more likely to occur in situations involving negative emotions than in pleasant or interpersonal situations.

Additional previous research, conducted specifically on binge eating, has reliably yielded evidence consistent with findings from the present study that binge eating commonly occurs in situations involving unpleasant emotions or the potential for relief. Baker (1998) developed and administered the IBES, as was administered in the present study, and similarly found that binge eating was less likely to occur in reward and social situations, and that instead, it primarily emerged in situations involving unpleasant emotions for undergraduate women. Mizes and Arbitell (1991) found that women with bulimia retrospectively rated their pre-binge levels of positive emotions as low, and of negative emotions as high. Eldredge and Agras (1996) found that individuals attending a weight loss program with binge eating disorder were more likely than controls to self-report a tendency to overeat in response to negative states. Several studies employing prospective research methods indicate that heightened negative affect commonly precedes binge episodes for bulimics (Davis, Freeman, & Garner, 1988; Johnson & Larson, 1982; Lingswiler, Crowther, & Stephens, 1989). There is also compelling experimental evidence that negative affect situations precede binge eating. Agras and Telch (1998) randomly assigned female binge eaters to receive either a negative or neutral mood induction, and found that negative, as compared to neutral, mood was associated with an increased likelihood of subsequent binge eating at a multi-item buffet. Overall, this research specifically on binge eating is consistent with the present research in suggesting that binge eating is likely in relief situations than other types of situations.

Previous findings on situations for heavy drinking (among individuals who do not necessarily have co-occurring binge eating) are also comparable to the present results. Together this research suggests that heavy drinking is likely to occur in negative contexts, but may also commonly occur in interpersonal or positive contexts. For example, in the present study, the top three situations that were ranked as posing the greatest risk for heavy drinking (i.e., situations involving unpleasant emotions, social pressure, and pleasant times with others) also fell within the ranked top four risk situations for heavy drinking (or other drug use) in four other studies that involved the administration of the IDS (Annis et al., 1987) (or an adapted IDS) among a clinical sample (Annis et al., 1987; Ross et al., 1994; Stewart, Samoluk et al., 2000; Turner, Annis, & Sklar, 1997). Marlatt and Gordon (1985) also review similar findings obtained prior to the development of the IDS measure. This suggests that both unpleasant emotion situations, as well as interpersonal and reward situations, commonly give rise to heavy drinking among clinical samples (and this appears to be true for both samples of men and women). Among non-clinical, student samples, heavy
drinking has been found to also commonly occur in interpersonal and reward situations; though, for this population, heavy drinking appears to occur less commonly in relief situations (cf. Baker, 1998; Carrigan et al., 1998).

Thus, the present study provides important verification that when binge eating and heavy drinking co-occur, each of these problems presents in a similar manner as when they occur separately, in terms of the situational contexts that trigger the problem behaviour in question. This study is one of the first to specifically compare situations for binge eating and heavy drinking among individuals who experience both problems, and is also one of the first to highlight important differences in the risk situations for these behaviours. The evidence obtained in this study of some similarities in situations for binge eating and heavy drinking is also theoretically informative as it may help explain why these behaviours commonly co-occur. They may both be relied upon to achieve some of the same goals (e.g., relief), and reflect a common underlying deficit in the ability to obtain desired relief with more adaptive strategies.

There are some clear limitations associated with this study. First, our use of the Binge Scale may be problematic as self-report instruments tend to over-identify binge eaters (Fairburn & Beglin, 1994). The situational risk data was also obtained from retrospective self-reports, and participants may not have accurately recalled or reported the situations in which their binge eating and heavy drinking occurred. Also of concern, our efforts at characterizing situations for binge eating vs. heavy drinking are only adequate by the extent to which the situation exemplars on the IBES (Baker, 1998) and IDS-42 (Annis et al., 1987) fully assess all the similar and unique risk situations for these behaviours. Previous research suggests there are important risk situations for these behaviours that were not measured in the present study. For example, the questionnaires in the present study do not specifically assess the role of predominantly cognitive situations in which there are abstinence or limit violation thoughts, or thoughts about perceived lack of control over intake (e.g., “I’ve already eaten/drank something I shouldn’t have, so I may as well go hog wild”) (cf. Lingswiler et al., 1989; Marlatt & Gordon, 1985). As well, none of the subscales provide a direct measure of how commonly physiological symptoms of alcohol withdrawal contribute to the risk for heavy drinking, or physiological symptoms of starvation prompt binge eating. Previous research suggests that starvation, in particular, is an important antecedent risk situation for binge eating (cf. Agras & Telch, 1998; Barlow, Durand, & Stewart., 2004; Davis et al., 1988; Franklin, Schiele, Brozek, & Keys, 1948; Mitchell, Hatsukami, Pyle, & Eckert, 1986; Mussell et al., 1997). (Self-report measures, however, may not accurately reflect the extent to which binge eating is driven by caloric deprivation because chronic restrictors tend to have reduced interoceptive awareness of hunger; cf. Agras and Telch; Heatherton & Baumeister, 1991.) Overall, further research is needed to compare the situations for binge eating and heavy drinking using more comprehensive methods, and methods other than self-report.

It should also be noted that findings from this study may not generalize to other groups of individuals who struggle with co-occurring binge eating and heavy drinking problems (e.g., women in treatment for an eating disorder or for both problems, women in a community sample, women with a higher socioeconomic status/income level than those tested in our sample, or men). The baseline frequency of binge eating and heavy drinking episodes respectively, may differ for each of these groups and this may affect the risk situations for both behaviours. In order to design effective interventions for each of these groups, further research needs to determine whether there are group-specific risk situations for the two problem behaviours.

There are important clinical implications associated with the finding from this study of both similarities and differences in the risk situations for binge eating and heavy drinking among alcoholic
women who binge eat. Interventions for this unique client population that enhance skills to cope with high risk situations common to both binge eating and heavy drinking may reduce the likelihood of both behaviours occurring in those situations. Thus, cognitive behavioural interventions that target impulsive responding or cognitions that arise in temptation situations, and that promote the use of more adaptive strategies to cope with negative affect, other than by binge eating or heavy drinking, may be particularly useful. In order to specifically help curb heavy drinking symptoms, treatments will also need to focus on preparing the client to deal with pleasant interpersonal risk situations. Training in cognitive behavioural, social skills, and drink refusal strategies could be useful in helping people to avoid drinking in response to pleasant social situations or emotions, and to develop new meaning whereby they can learn to enjoy social situations without drinking (cf. Maisto, Carey, & Bradizza, 1999; Marlatt & Gordon, 1985). Overall, targeting both the unique and similar situational determinants of binge eating and heavy drinking can help ensure the delivery of a client-centered treatment with an integrated psychotherapeutic approach for women with an alcohol use problem who struggle with both of these symptoms.

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