

# Effect of Self-Monitoring on Binge Eating: Treatment Response or ‘Binge Drift’?

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The current study aimed to determine if subjective bulimic episodes (SBEs) and objective bulimic episodes (OBEs) have different reactive effects to self-monitoring. Fourteen women with bulimia nervosa (57%) or binge eating disorder (43%) were diagnosed using the Eating Disorder Examination (EDE; version 12.0). During the 7-days post-interview, participants filled out daily self-monitoring records indicating the food consumed and any episodes of loss of control over eating. These records were reviewed and coded for OBEs and SBEs using the EDE coding scheme. Paired samples *t*-tests indicated that participants' average number of daily OBEs significantly decreased from baseline to the period of self-monitoring ( $t = 2.41$ ,  $p < 0.05$ , Cohen's  $d = 0.90$ ), whereas there was a significant increase from baseline to self-monitoring in their average number of SBEs ( $t = -2.41$ ,  $p < 0.05$ , Cohen's  $d = 0.86$ ). Of the 12 participants who showed a decrease in OBEs, 75% showed a concurrent increase in SBEs. The data suggest that the reactivity of OBEs to minimal or brief interventions may in part be due to binge drift, or the reduction of OBEs at the expense of increasing SBEs. Copyright © 2006 John Wiley & Sons, Ltd and Eating Disorders Association.

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## INTRODUCTION

Bulimia nervosa (BN) and binge eating disorder (BED) are both characterized by the core eating disturbance of recurrent episodes of binge eating (American Psychiatric Association, 1994). Operational definitions of binge eating identify two types of binge episodes, objective and subjective bulimic

episodes, based on the amount of food consumed and the subjective experience of loss of control (Fairburn & Wilson, 1993). Objective bulimic episodes (OBEs) differ from subjective bulimic episodes (SBEs) in the amount of food consumed during the episode. OBEs involve an unusually large amount of food, while SBEs do not reach the threshold for unusually large, but both share the same sense of loss of control. Research suggests loss of control is the most salient feature of binge eating for patients with BN and BED (Beglin & Fairburn, 1992; Johnson, Boutelle, Torgrud, Davig, & Turner, 2000; Johnson, Carr-Nangle, Nangle, Antony, & Zayfert, 1997; Telch, Pratt, & Nieg, 1998).

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Black and Wilson (1996) suggested that OBEs are the most appropriate outcome measure for binge eating, and reports of major treatment outcome studies for BN (e.g. Agras, Walsh, Fairburn, Wilson, & Kraemer, 2000) and BED (e.g. Wilfley et al., 2002) typically report just OBEs as the primary outcome. For example a review by Hay, Bacaltchuck, and Stefano (2004) listed 11-randomized controlled trials that used instruments that measured both OBEs and SBEs. Of these studies, two reported SBEs at outcome (Loeb, Wilson, Gilbert, & Labouvie, 2000; Peterson et al., 2000) and one recent additional study not included in the Hay et al. (2004) review also reported SBEs post-treatment (Walsh, Fairburn, Mickley, Sysko, & Parides, 2004). Results of these studies suggest that a significant proportion of BN and BED patients post-treatment continue to report SBEs (Loeb et al., 2000; Walsh et al., 2004) including those BED patients who are OBE free (Peterson et al., 2000). Thus, it is possible that SBEs provide important clinical information about treatment response for patients receiving treatment for BN or BED.

At least one study has indicated that SBEs respond more slowly to cognitive-behaviour therapy (CBT) than OBEs do (Niego, Pratt, & Agras, 1997). A majority (56%) of the decrease in OBE frequency in patients with BED occurred by week 4 in treatment, whereas SBE frequency decreased only 22% by week 4. Niego et al. (1997) postulated that this differential response could be related to the order of CBT interventions, with early treatment focusing on self-monitoring and the establishment of regular eating patterns, which may reduce OBEs. In contrast, cognitive interventions, which are the focus in latter stages of treatment, may have a greater impact on SBEs (Fairburn et al., 1993).

It is unknown why SBEs appear to decrease at a different rate than OBEs during CBT. It is possible that SBEs' slower response to treatment occurs because SBEs are better conceptualized as a measure of dietary restraint. Kerzhnerman and Lowe (2002) indicated that frequency of SBEs, even when controlling for frequency of OBEs, correlated with a composite measure of dieting based on the Eating Attitudes Test-26 and the Drive for Thinness subscale of the Eating Disorders Inventory-2. Thus, SBEs appear to be related to attitudes and beliefs about dieting in BN patients. Pratt, Niego, and Agras (1998) similarly found that SBEs and OBEs were related to psychopathology, self-esteem, psychological distress and core eating disorder pathology in patients with BN. These findings provide evidence for

the importance of specifically targeting SBEs in treatment.

Research on the reactive response of OBEs to early CBT interventions, such as self-monitoring (e.g. Latner & Wilson, 2002; Niego et al., 1997), seems to be inconsistent with the differential effects of CBT on frequency of SBEs and OBEs described by Niego et al. (1997). One hypothesis to explain this differential response is that self-monitoring may produce 'binge drift'—a decrease in OBEs with a concurrent increase in SBEs. The increased scrutiny of amount and types of food eaten potentially leads to an initial reduction in food consumed, and consequently reduces the probability for consumption of unusually large amounts of food (i.e. reduces the possibility of OBEs). However, self-monitoring alone does not address the dysfunctional beliefs or negative emotions associated with the perception of overeating and loss of control. Thus, a reduction in OBEs prompted by self-monitoring could potentially lead to an increase in SBEs without appropriate interventions regarding the negative emotions and dysfunctional beliefs about food and dieting. The presence of this proposed phenomenon has implications for further evaluation of mechanisms of change in research with binge-eating populations as well as evaluation of treatment outcomes. The present study examined the phenomenon of binge drift in women with BN and BED, by comparing the changes in OBE and SBE frequency from baseline to a period of self-monitoring.

## METHODS

### *Participants*

The sample consisted of 14 female participants from a study on nutrient intake and binge eating, the details of which have been reported elsewhere (Latner & Wilson, 2004). Patients met either DSM-IV diagnostic criteria for BN (57.1%) or DSM-IV research criteria for BED (42.9%; American Psychiatric Association (APA), 1994).

### *Procedure*

After phone screening, patients were interviewed using the Eating Disorders Examination (EDE; Fairburn & Cooper, 1993) in order to ensure DSM-IV diagnoses (APA, 1994). The EDE has established interrater reliability for BED (Wilfley et al., 2002) and BN (Cooper, Cooper, & Fairburn, 1989) as well as concurrent validity (Fairburn et al., 1993; Rosen,

Vara, Wendt, & Leitenberg, 1990) as a partially structured interview. Participants also received the Beck Depression Inventory-II (BDI-II; Beck, Steer, Ball, & Ranieri, 1996) as an assessment of depressive symptoms.

After being interviewed and diagnosed with either BN or BED, participants were taught how to self-monitor their food intake. They were instructed to record the type and estimated amount of all food and beverages consumed, as soon as possible after consumption. Participants also recorded the time and place they had eaten, and whether or not they experienced a sense of loss of control. Although participants were not asked to weigh their actual food intake, they were instructed to estimate all portion sizes using standard measurements or comparisons with common objects. This procedure was used so that the size of their intake (i.e. either moderate or clearly large) could be easily determined from food records. Expectancy effects about binge drift were minimized by informing participants that self-monitoring would not necessarily have any specific effect on their behaviour, but would simply be a useful tool for taking a closer look at it. Participants also did not receive any treatment during this time, and were given no indication that self-monitoring would have therapeutic value or harmful effects. All participants completed one food record during the training session in order to ensure that they had mastered the self-monitoring procedure.

Participants provided a convenient time for phone follow-up to cover possible questions regarding self-monitoring and to ensure compliance with self-monitoring procedures. During these follow-up conversations, participants read aloud and received feedback about their self-monitoring records, and any omissions or errors were corrected.

Beginning the day of the training session, participants kept daily food records until the time of their follow-up appointment. This appointment was scheduled 7 days later but fell within 6–13 days post-training session ( $M = 7.64$  days) due to the scheduling requirements of participants.

### Analyses

Independent samples *t*-tests were calculated to determine if there were differences in between patients with BN and BED on both baseline and self-monitoring measures. Average daily numbers of objective bulimic episodes and subjective bulimic episodes were calculated from the 28-day total

obtained from baseline EDE. Subsequent average daily numbers of objective and subjective bulimic episodes were calculated from self-monitoring records using the EDE coding scheme. Thus, eating episodes marked with loss of control were rated as either OBEs or SBEs based on the amount of food consumed (Fairburn & Cooper, 1993); those episodes involving an unequivocally large amount of food were rated as OBEs, and those not unequivocally large were rated as SBEs. Paired samples *t*-tests were used to compare baseline average OBEs and SBEs to those recorded during self-monitoring, and effect sizes were calculated using Cohen's *d*. Pearson product-moment correlations between BDI-II and OBE and SBE averages were also calculated. Proportions of individuals who exhibited increases or decreases in OBEs and SBEs from baseline to self-monitoring period were examined to describe changes in binge eating.

### RESULTS

Independent samples *t*-tests indicated no significant differences between patients diagnosed with BED or BN on BDI scores [ $t(12) = -0.42$ ,  $p = 0.69$ ], frequency of average daily OBEs [ $t(12) = -1.12$ ,  $p = 0.29$ ] or SBEs [ $t(12) = -0.56$ ,  $p = 0.59$ ] at baseline or average daily OBEs [ $t(12) = -0.61$ ,  $p = 0.55$ ] or SBEs [ $t(12) = 0.78$ ,  $p = 0.44$ ] during self-monitoring. Levene's test for equality of variances were non-significant for all independent samples *t*-tests suggesting no violations in homogeneity of variances.

Figure 1 summarizes the changes from baseline to self-monitoring in OBEs and SBEs. Paired samples *t*-tests indicated a significant decrease in the frequency of average daily OBEs from baseline to self-monitoring [ $t(13) = 2.41$ ,  $p < 0.05$ , Cohen's  $d = 0.90$ ]. Conversely, a significant increase in the frequency of average daily SBEs was observed from baseline to self-monitoring [ $t(13) = -2.41$ ,  $p < 0.05$ , Cohen's  $d = 0.86$ ].

At baseline, 14.3% of participants (2/14) reported no SBEs versus 7.0% (1/14) reporting no SBEs after self-monitoring. The proportion of individuals who experienced an increase in SBEs and a decrease in OBEs from baseline to self-monitoring was 64.3% (9/14), and those who experienced an increase in OBEs was 14.3% (2/14) versus a decrease in OBEs 85.7% (12/14). Only 21.4% (3/14) reported a subsequent decrease in both OBEs and SBEs. One participant reported abstinence from SBEs during self-monitoring and 14.3% (2/14) reported only SBEs during self-monitoring.

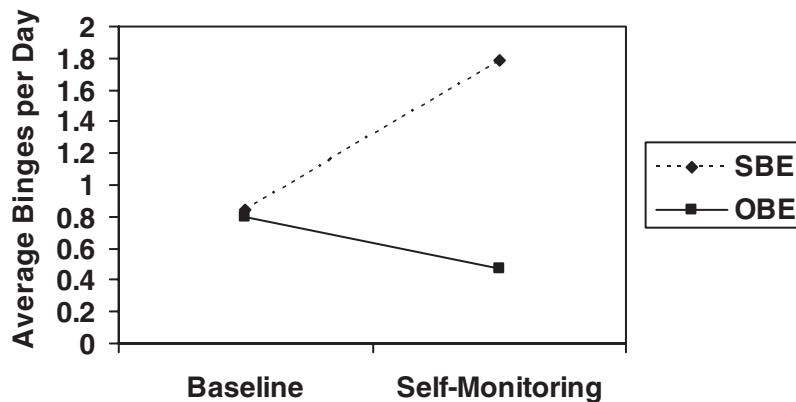


Figure 1. Summary of changes in binge eating from baseline to self-monitoring.

Correlations between BDI-II scores and OBEs and SBEs at baseline were not significant.

## DISCUSSION

The data provided support for the phenomenon of binge drift in individuals with BN and BED who self-monitor their food intake. Although the sample size was small, large effect sizes suggest that the phenomenon is relatively robust, and likely to be replicable in larger samples. Additionally, a majority of participants experienced an increase in SBEs and concurrent decrease in OBEs. This finding suggests that the phenomenon of binge drift is not limited to a small proportion of individuals, but may be a common response to self-monitoring.

There are several implications for binge episode drift. First, this phenomenon suggests that OBEs and SBEs require different targeted interventions. Because of the relationship between dietary restraint and SBEs observed by Kerzhnerman and Lowe (2002), it is possible that SBEs would be more likely to respond to interventions specifically aimed at dietary restraint. Recent research however indicates that dietary restraint scales do not measure actual behavioural caloric restriction, and these scales may instead more accurately measure the cognitive features associated with dieting (Stice, Fisher, & Lowe, 2004; Sysko, Walsh, Schebendach, & Wilson, 2005). Furthermore, Safer, Agras, Lowe, and Bryson (2004) found that TFEQ-cognitive restraint scale did not significantly change in response to CBT for BN. Thus, it would be important to better understand what aspects of dietary restraint are best indicated by SBEs.

Binge drift may also lead to artificially inflated reports of treatment response, where participants are reported to respond to treatment based on OBE improvement alone despite concurrent increases in SBEs. For instance, Peterson et al. (2000) reported continued presence of SBEs in participants who had responded to treatment with cessation of OBEs. Treatment outcome studies have largely underreported SBEs, despite evidence that SBEs are an important feature of eating disorder pathology (Pratt et al., 1998).

Despite the identification and description of binge drift, there are several limitations to the current study. The sample size was small, and the present findings should be replicated in a larger sample. Accurate measurement of SBEs is essential to validating the existence of binge drift, and the current study was limited by the different time scales used in calculating average OBEs and SBEs. Several studies suggest that measures of SBEs, even including the widely used EDE, have inadequate test-retest reliability (Grilo, Masheb, Lozano-Blanco, & Barry, 2004; Rizvi et al., 2000). However, a majority of participants reported unidirectional changes in SBEs during self-monitoring, which suggests that the changes were not a result of random error or lack of reliability. If this were the case, we would expect equal distribution of participants reporting increases and decreases in SBEs. Finally, it is possible that a third factor, independent of self-monitoring, led to binge drift. For example participants' awareness of SBEs may have increased as a result of completing the baseline measures. However, neither were participants given any treatment, nor were they self-monitoring in the context of treatment; thus, participants were unlikely to be

influenced by expectancy effects related to the success of treatment. Of course, it is possible that participants would have had positive expectancies despite this instruction, as they were aware that they would be receiving treatment in the future.

Future research on binge eating would benefit from the inclusion of both SBEs and OBEs as primary outcome measures in treatment studies. Comparisons of the treatment response of these two types of episodes are especially important in the analysis of time course of symptom change. First, an understanding of treatment mechanisms will require the evaluation of how specific interventions affect different symptoms over time. Second, the presence of binge drift in those diagnosed with BN or BED may be an important phenomenon for those who fluctuate between meeting the diagnostic criteria for binge-eating frequency and ceasing to meet criteria. Given the common practice of self-monitoring in treatment programmes for obesity, and the high prevalence of binge eating among individuals presenting for treatment of obesity (Spitzer et al., 1993), binge drift may disguise clinically significant eating disorders. This may have particular relevance for accurately evaluating patients for eating disorders when they have recently been self-monitoring, such as in commercial weight loss programmes. However, future research on binge drift would benefit from determining the duration of the effect of self-monitoring on OBEs, as it is unclear how long the effects of self-monitoring persist without additional treatment.

The present findings, like those of Niego et al. (1997), suggest that the successful reduction of SBEs may require treatment strategies that addresses problematic cognitions, such as those used in the later stages of CBT. An implication of the present study is that prescribing self-monitoring, outside the context of treatment that also addresses patients' cognitive and emotional concerns, could possibly lead to binge drift, where OBEs decrease but SBEs increase early in treatment. Therefore, patients with BED who are treated with standard behavioural weight loss may need to be carefully observed during the initial weeks of treatment for binge drift.

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## REFERENCES

- Agras, W. S., Walsh, T., Fairburn, C. G., Wilson, G. T., & Kraemer, H. C. (2000). A multicenter comparison of cognitive-behavioral therapy and interpersonal psychotherapy for bulimia nervosa. *Archives of General Psychiatry*, 57, 459–466.
- American Psychiatric Association. (1994). *Diagnostic and statistical manual of mental disorders* (4th ed.). Washington, DC: APA.
- Beck, A. T., Steer, R. A., Ball, R., & Ranieri, W. (1996). Comparison of Beck Depression Inventories -IA and -II in psychiatric outpatients. *Journal of Personality Assessment*, 67, 588–597.
- Beglin, S. J., & Fairburn, C. G. (1992). What is meant by the term "binge"? *American Journal of Psychiatry*, 149, 123–124.
- Black, C. M., & Wilson, G. T. (1996). Assessment of eating disorders: Interview versus questionnaire. *International Journal of Eating Disorders*, 20, 43–50.
- Cooper, Z., Cooper, P. J., & Fairburn, C. G. (1989). The validity of the eating disorder examination and its subscales. *British Journal of Psychiatry*, 154, 807–812.
- Fairburn, C. G., & Cooper, Z. (1993). The Eating Disorder Examination (12th ed.). In C. G. Fairburn, & G. Wilson (Eds.), *Binge eating: Nature, assessment, and treatment* (pp. 317–332). New York: Guilford Press.
- Fairburn, C. G., Marcus, M. D., & Wilson, G. T. (1993). Cognitive-behavioral therapy for binge eating and bulimia nervosa: A comprehensive treatment manual. In C. G. Fairburn, & G. Wilson (Eds.), *Binge eating: Nature, assessment, and treatment* (pp. 317–332). New York: Guilford Press.
- Fairburn, C. G., & Wilson, G. (1993). Binge eating: Definition and classification. In C. G. Fairburn, & G. Wilson (Eds.), *Binge eating: Nature, assessment, and treatment* (pp. 3–14). New York: Guilford Press.
- Grilo, C. M., Masheb, R. M., Lozano-Blanco, C., & Barry, D. T. (2004). Reliability of the Eating Disorder Examination in patients with binge eating disorder. *International Journal of Eating Disorders*, 35, 80–85.
- Hay, P. J., Bacaltchuck, J., Stefano, S. (2004). Psychotherapy for bulimia nervosa and binge eating. *Cochrane Database System Review*, 3, CD000562.
- Johnson, W. G., Boutelle, K. N., Torgrud, L., Davig, J. P., & Turner, S. (2000). What is a binge? The influence of amount, duration, and loss of control criteria on judgments of binge eating. *International Journal of Eating Disorders*, 27, 471–479.
- Johnson, W. G., Carr-Nangle, R. E., Nangle, D. W., Antony, M. M., & Zayfert, C. (1997). What is binge eating? A comparison of binge eater, peer, and professional judgments of eating episodes. *Addictive Behaviors*, 22, 631–635.
- Kerzhnerman, I., & Lowe, M. R. (2002). Correlates of subjective and objective binge eating in binge-purge syndromes. *International Journal of Eating Disorders*, 31, 220–228.
- Latner, J., & Wilson, G. (2002). Self-monitoring and the assessment of binge eating. *Behavior Therapy*, 33, 465–477.

- Latner, J. D., & Wilson, G. T. (2004). Binge eating and satiety in bulimia nervosa and binge eating disorder: Effects of macronutrient intake. *International Journal of Eating Disorders*, 36, 402–415.
- Loeb, K. L., Wilson, G. T., Gilbert, J. S., & Labouvie, E. (2000). Guided and unguided self-help for binge eating. *Behaviour Research and Therapy*, 38, 259–272.
- Niego, S. H., Pratt, E. M., & Agras, W. S. (1997). Subjective or objective binge: Is the distinction valid? *International Journal of Eating Disorders*, 22, 291–298.
- Peterson, C. B., Crow, S. J., Nugent, S., Mitchell, J. E., Engbloom, S., & Mussell, M. P. (2000). Predictors of treatment outcome for binge eating disorder. *International Journal of Eating Disorders*, 28, 131–138.
- Pratt, E. M., Niego, S. H., & Agras, W. S. (1998). Does the size of a binge matter? *International Journal of Eating Disorders*, 24, 307–312.
- Rizvi, S. L., Peterson, C. B., Crow, S. J., & Agras, W. S. (2000). Test-retest reliability of the eating disorder examination. *International Journal of Eating Disorders*, 28, 311–316.
- Rosen, J., Vara, L., Wendt, S., & Leitenberg, H. (1990). Validity studies of the eating disorder examination. *International Journal of Eating Disorders*, 9, 519–528.
- Safer, D. L., Agras, W. S., Lowe, M. R., & Bryson, S. (2004). Comparing two measures of eating restraint in bulimic women treated with cognitive-behavioral therapy. *International Journal of Eating Disorders*, 36, 83–88.
- Spitzer, R. L., Yanovski, S., Wadden, T., Wing, R., Marcus, M. D., Stunkard, A. (1993). Binge eating disorder: It's further validation in a multisite study. *International Journal of Eating Disorders*, 13, 137–153.
- Stice, E., Fisher, M., & Lowe, M. R. (2004). Are dietary restraint scales valid measures of acute dietary restriction? Unobtrusive observational data suggest not. *Psychological Assessment*, 16, 51–59.
- Sysko, R., Walsh, B. T., Schebendach, J., & Wilson, G. T. (2005). Eating behavior among women with anorexia nervosa. *American Journal of Clinical Nutrition*, 82, 296–301.
- Telch, C. F., Pratt, E. M., & Niego, S. H. (1998). Obese women with binge eating disorder define the term binge. *International Journal of Eating Disorders*, 24, 313–317.
- Walsh, B. T., Fairburn, C. G., Mickley, D., Sysko, R., & Parides, M. K. (2004). Treatment of bulimia nervosa in a primary care setting. *American Journal of Psychiatry*, 161, 556–561.
- Wilfley, D. E., Welch, R. R., Stein, R. I., Spurrell, E. B., Cohen, L. R., Saelens, B. E. (2002). A randomized comparison of group cognitive-behavioral therapy and group interpersonal psychotherapy for the treatment of overweight individuals with binge-eating disorder. *Archives of General Psychiatry*, 59, 713–721.