

BRIEF
REPORT

Impulsivity in restrained eaters: Emotional and external eating are associated with attentional and motor impulsivity

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ABSTRACT. *The current study examined the relationships of motor, nonplanning, and attentional impulsivity to external and emotional eating among restrained eaters. Data were collected from a female college sample of restrained eaters (N=90). Aspects of impulsivity and disordered eating were assessed using the Barratt Impulsiveness Scale, Version 11, the Attentional Control Scale and the Dutch Eating Behavior Questionnaire. Significant correlations emerged between eating disturbances and different types of impulsivity. The results indicated that restrained eating is associated with motor and attentional forms of impulsivity. Emotional eating appears to be linked to both attentional and motor impulsivity whereas external eating seems to be linked only to motor impulsivity. Future studies should explore which aspects of disinhibited eating among restrained eaters are best predicted by a tendency to act impulsively.*

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INTRODUCTION

Impulsivity has been found to be elevated in eating-disordered samples compared to nonclinical samples (1, 2). Few studies, however, have examined impulsivity in restrained eaters. Restrained eaters, who attempt to restrict their caloric intake in order to lose weight (3), have more difficulties on tasks measuring attention than non-restrained eaters (4). Restrained eaters also demonstrate difficulties inhibiting ongoing motor responses, indicating increased impulsivity (5, 6).

Impulsivity, a multidimensional construct rather than a unidimensional trait, involves difficulties in the areas of attention control, planning and motor disinhibition (7). Motor impulsivity comprises physical hyperactivity due to the need for movement; attentional impulsivity involves difficulties focusing and sustaining attention. Nonplanning impulsivity includes difficulties with foresight, planning and reflection. Impulsivity may be expressed in any of these areas in any given combination. Therefore, it is important to elucidate the role that the three dimensions of impulsivity may play in restrained eaters.

Recent research has identified impulsivity as a risk factor for overeating among

restrained eaters (5). Two factors may cause overeating in restrained eaters: emotional eating and external eating, both of which represent two different aspects of disinhibition. Emotional eating occurs in response to an aroused emotional state, whereas external eating occurs in response to external food cues (e.g., the smell or sight of food; 8). The relationship between impulsivity and emotional and external eating in restrained eaters has not yet been examined. Thus, the goal of the current study was to explore the relationships of motor, attentional, and nonplanning impulsivity to external and emotional eating among restrained eaters. It is predicted that motor and attentional impulsivity are linked to both factors of disinhibited eating. Moreover, it is expected that nonplanning impulsivity will not be associated with either emotional or external eating.

METHOD

Participants

This sample included 90 female undergraduates from the University of Canterbury, New Zealand who scored above 16 on the Revised Restraint Scale (RRS; 9). Partici-

Key words:

Restrained eaters, attentional impulsivity, motor impulsivity, emotional eating, external eating.

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pants had a mean age of 21.7 years (SD=6.5) and a mean Body Mass Index (BMI; kg/m²) of 23.7 (SD=2.7). Participants were: 94.4% Caucasian, 2.2% Asian, 2.2% New Zealand Maori, and 1.1% Samoan. Height and weight were assessed in the laboratory using a digital scale. Participants received gift vouchers. This study was approved by the Human Ethics Committee of the University of Canterbury.

Instruments

Measures of Eating Disordered Symptoms

Revised Restraint Scale. The RRS (9) is a 10-item self-report measure assessing attitudes towards weight, degree and frequency of dieting, disinhibition of eating, and weight fluctuations. The RRS is a widely used measure of dietary restraint with scores of 16 or above categorizing individuals as restrained eaters (10). Items are scored on a 5-point Likert scale, with higher scores indicating greater intention to restrict eating.

Dutch Eating Behavior Questionnaire (DEBQ). The DEBQ (8) contains three scales: restrained eating, emotional eating, and external eating. In the present study, only the emotional and external eating subscales were used. Items are scored on a 5-point Likert scale with higher scores indicating greater emotional eating and external eating.

Measures of Impulsivity

Attentional Control Scale (ACS). The ACS (11) consists of 20 items assessing three areas of attentional processes: the ability to focus attention and avoid distraction, the ability to shift between tasks, and the ability to flexibly control thoughts. Items are scored on a 4-point scale, and higher total scores reflect greater attentional control.

Barratt Impulsiveness Scale (BIS-11). The BIS-11 (7) is a 30-item questionnaire assessing three dimensions of trait impulsiveness: attentional, motor and nonplanning impulsiveness. Items are scored on a 4-point scale, with higher scores indicating greater impulsiveness.

RESULTS

Mean scores and reliability coefficients were computed for all measures and are reported in Table 1.

Correlations between Impulsivity and Eating Factors

Partial correlations were performed on the BIS, ACS and DEBQ subscales to evaluate the associations between the three aspects of

impulsivity and the two factors of eating disturbances, while controlling for BMI.

Greater emotional eating on the DEBQ was correlated with poorer ACS-measured attentional control ($r=-0.25$; $p<0.05$) and higher attentional impulsivity on the BIS-11 ($r=0.22$; $p<0.05$). In addition, greater emotional eating was correlated with greater motor impulsivity ($r=0.22$; $p<0.05$). Emotional eating was not correlated with nonplanning impulsivity.

Greater external eating was correlated with greater motor impulsivity ($r=0.24$; $p<0.05$). However, external eating was not correlated with nonplanning impulsivity or attentional control as measured by the ACS or BIS-11.

Multiple Regression Analysis

Regression analysis with emotional eating assessed by the DEBQ as dependent variable and ACS means scores, BMI as well as the three subscales of the BIS-11 as independent variables, significantly predicted emotional eating ($F(5,83)=3.31$, $p<0.01$, $R^2=0.17$). Motor impulsivity ($\beta=0.28$, $t=2.29$, $p<0.05$) and BMI ($\beta=0.05$, $t=2.02$, $p<0.05$) emerged as significant predictors of emotional eating.

A second multiple regression analysis with external eating as measured by the DEBQ as dependent variable and ACS means scores, BMI, as well as the three subscales of the BIS-11 as independent variables, significantly predicted external eating ($F(5,83)=1.99$, $p<0.05$, $R^2=0.11$). Motor impulsivity emerged as a significant predictor of external eating ($\beta=0.38$, $t=2.95$, $p<0.01$).

DISCUSSION

The results of this study demonstrate that

TABLE 1
Mean scores (standard deviations) and reliability coefficients for all measures.

Variable	N=90	α
ACS	50 (7.2)	0.79
BIS-11 Total	2.3 (0.3)	0.79
Attentional impulsivity	2.3 (0.4)	0.58
Motor impulsivity	2.4 (0.4)	0.67
Nonplanning impulsivity	2.3 (0.3)	0.55
RRS	19.7 (3.1)	0.82
DEBQ Total	37.4 (6.9)	0.86
Emotional eating	3.9 (0.7)	0.87
External eating	4.3 (0.5)	0.73

ACS: Attentional Control Scale; BIS-11: Barratt Impulsiveness Scale; RRS: Revised Restraint Scale; DEBQ: Dutch Eating Behavior Questionnaire.

greater emotional eating is associated with greater impairment in attentional impulsivity among restrained eaters. Attentional impulsivity has been associated with increased anxiety (7), which may in turn lead to emotional eating. Indeed, negative mood states such as anxiety have been shown to increase binge eating (12). In an experimental study, negative mood was induced in women who scored either high or low on the BIS-11 (13). Self-perceived emotional eating was assessed with the DEBQ before and after the mood induction (13). Highly impulsive participants increased their self-perceived emotional eating in response to negative mood induction more than non-impulsive participants (13). The connection between negative arousal states and emotional eating has been explained by the "limited capacity hypothesis", stating that restrained eaters increase food intake because negative emotions impair cognitive control over their restrictive eating patterns (14). The present study suggests that restrained eaters who are more attentionally impulsive may overeat more often and report more dietary failures in response to emotional cues than restrained eaters who are less attentionally impulsive.

However, in the regression analyses, only motor impulsivity emerged as a significant and independent predictor of both emotional and external eating. If someone is physically restless, eating may be seen as a form of activity that serves as a distraction or outlet. In fact, in the general population, impulsivity is associated with heightened food intake (15). External cues such as the sight, smell or thought of palatable food naturally induce appetite (6). Restrained eaters who are characterized with limited inhibitory control may be more likely to fail in their attempts to restrict intake, increasing the probability of overeating.

Finally, the current study revealed no significant correlation between nonplanning impulsivity and either type of disinhibited eating among restrained eaters. Nonplanning impulsivity, which is precipitated by a lack of reflection, appears to be uncharacteristic of restrained eaters.

Exploratory in its nature, the current study has limitations. Self-report measures, used here to assess impulsivity and restrained eating, may have less validity than behavioral measures, being potentially biased by demand characteristics and limited self-insight. Therefore, future studies should include behavioral measures of attentional and motor impulsivity. Furthermore, only participants with a high score on the RRS were included; therefore, caution should be used when generalizing the present findings. Previous research has suggested that restrained

eat-ers are more impulsive than unrestrained eaters (6); however, the current study is limited to examining correlates of eating styles and impulsivity within only restrained eaters. Future research would benefit from including a control group of unrestrained eaters. The use of the RRS presents an additional limitation, since it has been suggested that the scale may tap into disinhibition as well as restraint (16). Therefore, it is recommended that future studies utilize additional measures of restrained eating such as the Three Factor Eating Questionnaire (17), in order to identify a broader range of dieters and avoid selecting dieters with a tendency to overeat; however, validity problems remain across multiple scales attempting to measure restraint (e.g. 18).

The results of the current study are consistent with recent literature indicating that impulsivity is associated with disinhibited eating (5) by showing an association with emotional and external eating, two factors related to overeating and eating disturbances. Furthermore, the results emphasize the need to expand research in two areas. Future studies should, first, explore which aspects of eating are best predicted by a tendency to act impulsively, and second, elucidate which aspects of impulsivity are related to disordered eating behaviors and cognitions. This, in turn, may be helpful in developing interventions that reduce especially motor impulsivity in individuals who may overeat due to their underlying impulsive tendencies.

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