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Clarifying the role of impulsivity in dietary restraint: A structural equation modeling approach

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ABSTRACT

This study was designed to clarify the relationship between the four dimensions of impulsivity in Whiteside and Lynam's (2001) model and the two aspects of dietary restraint (Concern for Dieting and Weight Fluctuation) in a non-clinical sample. Data were collected from a volunteer community sample ($N = 216$) of women who responded to two self-report instruments related to impulsivity (UPPS Impulsive Behavior Scale, Whiteside & Lynam, 2001) and dietary restraint (Restraint Scale, Polivy, Herman, & Warsh, 1978). A structural equation model was tested. The model provided a good fit to the data ($\chi^2/df = 1.64$, $p < .0001$, RMSEA = 0.054, 90% CI = 0.050–0.058, p -value for test of close fit (RMSEA > 0.05) = .035) and revealed that Concern for Dieting was positively related to Urgency (standardized $\beta = 0.25$, $p < .01$). Weight Fluctuation was related to lack of Perseverance (standardized $\beta = 0.25$, $p < .01$) and tended to relate to Sensation Seeking (standardized $\beta = 0.17$, $p = .056$). Urgency and lack of Perseverance were found to play a significant role in predicting Concern for Dieting and Weight Fluctuation.

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1. Introduction

Impulsivity is a multidimensional concept that has been conceptualized in various ways and that incorporates “actions that are poorly conceived, prematurely expressed, unduly risky, or inappropriate to the situation and that often result in undesirable outcomes” (Evenden, 1999, p. 348). Impulsivity also involves a tendency to seek sensations and rewards (Evenden, 1999). A number of studies have shown that different aspects of impulsivity are related to eating disorders in clinical (e.g., Claes, Vandereycken, & Vertommen, 2005) and in non-clinical populations (e.g., Lyke & Spinella, 2004). More specifically, it has been found that motor impulsivity (indicating proneness to imprudent actions), cognitive/attention impulsivity (indicating inability to maintain focused attention) and heightened reward sensitivity are associated with problematic eating behaviors, such as overeating, dieting and weight fluctuation. Loxton and Dawe (2001) revealed that greater sensitivity to both reward and punishment predicts dysfunctional eating in 16- to 18-year-old girls. Furthermore, Guerrieri, Nederkorn, and Jansen (2007) showed that high levels of impulsivity is

associated with higher food intake in a population of undergraduates.

Research on impulsivity and dietary restraint and eating disorders has relied on many different self-report scales that measure a wide range of impulsive behaviors. Recently, Whiteside and Lynam (2001) clarified the various conceptions of impulsivity by means of factor analyses conducted on 10 commonly used impulsivity measures; these measures revealed four components associated with impulsive behaviors. The four components, which are the basis for the UPPS Impulsive Behavior Scale, are: (1) Urgency, defined as “the tendency to experience strong impulses, frequently under conditions of negative affect”; (2) lack of Premeditation, defined as “the tendency not to think and reflect on the consequences of an act before engaging in it”; (3) lack of Perseverance, defined as “the inability to remain focused on a task that may be boring or difficult”; (4) Sensation Seeking, defined as “the tendency to enjoy and pursue activities that are exciting, and openness for new experiences”.

Studies using the UPPS Impulsive Behavior Scale conducted on non-clinical samples (e.g., Anestis, Selby, & Joiner, 2007; Fischer, Smith, & Anderson, 2003) revealed that bulimic symptoms (loss of control over eating, vomiting) were positively related to Urgency, but not to the other facets of the scale. However, two other studies, which used the revised NEO-Personality Inventory (Costa & McCrae, 1992) in both clinical (Claes et al., 2005) and non-clinical populations (Miller, Flory, Lynam, & Leukefeld, 2003), revealed that bulimic symptoms are positively related to Urgency, lack of

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Premeditation and lack of Perseverance, although the latter relations were weaker than the relation with Urgency. In the Claes et al. study (2005), patients with bulimia showed more Urgency, more Sensation Seeking, less Perseverance and less Premeditation than patients with restrictive anorexia nervosa, while patients with bulimia and binge/purging anorexia nervosa did not differ significantly from each other with respect to impulsivity-related traits, except for Urgency, where patients with bulimia scored higher.

Previous studies of non-clinical populations focused on the relationship between impulsivity and bulimic symptoms, but the relationship between dietary restraint and impulsivity has received a fair amount of attention. Dietary restraint defines a type of eating behavior that is governed by cognitive processes (Concern for Dieting) rather than by physiological mechanisms such as hunger and satiety. Dietary restraint is used to achieve or maintain a desired body weight; however, high levels of dietary restraint are not associated with successful weight control because people with high levels of dietary restraint are also prone to episodes of overeating (Heatherton, Herman, Polivy, King, & McGree, 1988). Over time, a succession of restraint and overeating episodes lead to weight fluctuation and even eating disorders. Thus, a clearer understanding of the association between dietary restraint and different facets of impulsivity is important for a better understanding of the development of eating disorders. Dietary restraint can be assessed by the Restraint Scale and its Concern for Dieting and Weight Fluctuation subscales.

In this context, the objective of the present study was to explore how the four dimensions of Whiteside and Lynam's model of impulsivity are linked with dietary restraint in a non-clinical sample. It was hypothesized that lack of Perseverance and high Sensation Seeking would be associated with Concern for Dieting, and that Urgency and lack of Premeditation would be associated with Weight Fluctuation. As proposed by Dawe and Loxton (2004), reward sensitivity may contribute to greater sensitivity and attention towards food-related stimuli (e.g., TV commercials) and therefore be associated with a desire to eat and Concern for Dieting. Lack of Perseverance may be associated with Concern for Dieting via a difficulty controlling thoughts related to food and body shape (body dissatisfaction). In this context, Urgency and lack of Premeditation may contribute to the inability to resist eating and to loss of control over eating, and therefore contribute to Weight Fluctuation.

To explore the associations between impulsivity and the two aspects of dietary restraint, structural equation modeling (SEM) was applied. The main advantage of SEM in this context is its capacity to simultaneously estimate all effects of the four impulsivity factors on the two dietary restraint dimensions. Moreover, SEM allows one to adjust for measurement errors, thereby providing unbiased estimates of the potential associations between the impulsivity and dietary restraint constructs. These aims cannot be attained with standard regression analysis.

2. Method

2.1. Participants

A community sample of 216 female volunteers aged from 20 to 35 years (mean = 24.77, SD = 3.65) and representing a range of professions took part in the study. All participants were native or fluent French speakers and gave their written informed consent prior to their inclusion in the study. They had a normal self-reported body mass index [BMI; kg/m²] (mean = 20.88, SD = 2.56) and a mean of 14.56 years of education (SD = 2.25).

2.2. Procedure

Participants were screened using the French version of the Restraint Scale (Lluch, 1995) and the French version of the UPPS Impulsive Behavior Scale (Van der Linden et al., 2006). The French versions of two scales have been shown to have desirable psychometric properties.

2.3. Questionnaires

UPPS Impulsive Behavior Scale (UPPS). The French version of the UPPS Impulsive Behavior Scale (Van der Linden et al., 2006), translated from Whiteside and Lynam (2001), consists of 45 items that evaluate four different facets of impulsivity, labeled Urgency (12 items), lack of Premeditation (11 items), lack of Perseverance (10 items), and Sensation Seeking (12 items). Items on the scale are scored from 1 to 4, with 1 = "I agree strongly", 2 = "I agree somewhat", 3 = "I disagree somewhat", and 4 = "I disagree strongly". Some items are reversed so that, across all items, a high score reveals an impulsive personality trait.

Restraint Scale (RS). The French version of the Restraint Scale (Lluch, 1995), translated from Polivy et al. (1978), consists of 10 items that evaluate two facets of dietary restraint, labeled Weight Fluctuation (4 items), and Concern for Dieting (6 items). The items are scored on a four- or five-point scale, with higher scores reflecting higher levels of restrained eating. Reliability and validity data on the total scale were provided by Heatherton et al. (1988). The French version of the Restraint Scale has been factor-analyzed and validated with an obese sample (Lluch, 1995), but not with a non-clinical normal-weight sample. In order to use it in our normal-weight sample, we conducted an exploratory factor analysis with oblique rotation on the 10 items of the Restraint Scale for the 216 women. Exploratory factor analysis is used to determine the number of factors that account for the covariation between the variables before we test hypothesized models with confirmatory factor analysis. As expected, two correlated factors were extracted and the pattern of salient loadings, as well as the strongest loading marking each factor, corresponded to those of the original scale (cf. Table 1). We also compared the two-factor structure with a simpler one-factor structure: the former proved to be statistically superior to the latter ($\Delta\chi^2 = 98.57$ for $\Delta df = 2$, $p < .0001$). This justified including the two-factor representation of the RS in the subsequent overall model with the UPPS variables.

Table 1
Completely standardized factor loadings for the Restraint Scale

Scale/item	Factor 1	Factor 2
<i>Weight Fluctuation</i>		
Item 2	0.76	–
Item 3	0.86	–
Item 4	0.59	–
Item 10	0.66	–
<i>Concern for Dieting</i>		
Item 1	–	0.75
Item 5	–	0.55
Item 6	–	0.53
Item 7	–	0.62
Item 8	–	0.77
Item 9	–	0.29

The 2 factors correlated at .65. All parameter estimates are significant at $p < .001$.

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