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Research report

# Are common measures of dietary restraint and disinhibited eating reliable and valid in obese persons? ☆

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ABSTRACT

Disordered eating measures were developed and validated in primarily normal weight samples; thus, it is unclear if the psychometric properties are equivalent across weight groups. This study evaluated the reliability and validity of self-reported disinhibited eating and dietary restraint measures in a community-recruited sample of overweight individuals ($N = 201$) and obese individuals ($N = 101$) and normal weight matched controls. Coefficient alpha and average inter-item correlations were used to test internal consistency reliability. Correlations between lifetime disordered eating behaviors and measures of dietary restraint and disinhibited eating were used to test convergent validity. Disordered eating measures included: Eating Disorders Examination Questionnaire (EDE-Q), Three Factor Eating Questionnaire (TFEQ), Dutch Eating Behavior Questionnaire (DEBQ), Eating Disorders Inventory-3 (EDI-3), and Restraint Scale. Correlations between lifetime disordered eating behaviors and measures of non-disordered-eating-related psychopathology were used to test discriminant validity. Results indicated that most measures demonstrated acceptable internal consistency reliability across groups, with the exception of the Restraint Scale. Significantly higher convergent correlations between lifetime history of fasting and TFEQ Cognitive Restraint emerged for the overweight vs. obese group, and the magnitude of discriminant correlations between lifetime history of binge eating and the Inventory of Depression and Anxiety Symptoms (IDAS) Well Being scale was stronger in the normal weight vs. overweight group. Findings suggest the majority restrained and disinhibited eating measures are reliable and valid among weight groups, and are suitable to use in overweight and obese populations.



## Introduction

Overweight and obesity are significant public health concerns that affect approximately two-thirds of United States adults (Statistics NCfH, 2012.). Multiple adverse health outcomes are linked to obesity, such as type II diabetes, heart disease, and cancer (Calle, Rodriguez, Walker-Thurmond, & Thun, 2003; Field et al., 2001; Folsom et al., 2000; Must et al., 1999). In addition to high rates of medical morbidity, obesity commonly co-occurs with eating disorders (Neumark-Sztainer, 2009), with recent research indicating the lifetime prevalence of obesity is over 80% among individuals with binge eating disorder (Villarejo et al., 2012). Yet, a substantial number of overweight and obese persons engage in disordered eating behaviors that do not meet criteria for a diagnosable eating disorder (ED) (Hay, Mond, Buttner, & Darby, 2008; Mond, Hay, Rodgers, & Owen, 2009), and some studies suggest that the co-occurrence of obesity and disordered eating behaviors has increased (Darby et al., 2009). Binge eating is present among 23–46% of overweight or obese persons (Bulik, Sullivan, & Kendler, 2002), and other research has theorized that dietary restraint (Polivy & Herman, 1985) (i.e., cognitive [mental] efforts to reduce or limit what one is eating, independently of whether or not such efforts are successful) may represent a risk factor for development of overweight and obesity if an individual experiences lapses in their cognitive control over eating (Fairburn & Harrison, 2003; Polivy & Herman, 1985; Stice, 2002). However, because of the paucity of evidence to suggest that measures of dietary restraint are correlated with actual dietary restriction, some have criticized the validity of the dietary restraint model (Lowe & Butryn, 2007; Lowe & Levine, 2005; Stice, Cooper, Schoeller, Tappe, & Lowe, 2007; Stice, Fisher, & Lowe, 2004).

In light of increasing rates of overweight and obesity both in the United States and worldwide, there is a critical need for accurate disordered eating self-report measures in this population.

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Self-report eating pathology measures are widely used in overweight and obese populations to predict the onset and maintenance of obesity (Hrabosky et al., 2008) and to evaluate disordered eating behaviors (Lang, Hauser, Buddeberg, & Klaghofer, 2002; White, Kalarchian, Masheb, Marcus, & Grilo, 2010). Self-report measures of eating pathology have also become increasingly important in helping to determine eligibility for bariatric surgery (Bauchowitz et al., 2005; Kalarchian, Wilson, Brolin, & Bradley, 1998). However, because many of these measures were developed and validated in primarily normal weight samples, it is unclear if the psychometric properties of these measures are equivalent in obese groups. If a measure is differentially valid among weight groups, it would be expected to demonstrate attenuated correlations with other variables in the "disadvantaged" group (Young & Kobrin, 2001), despite both groups having similar levels of the latent construct. This is problematic because if relations between variables are attenuated in one group (relative to another group), it could potentially lead to errors in estimates of the associations between eating pathology and other substantive variables.

Based on the results of previous studies, it appears that common measures of dietary restraint and binge eating may be differentially valid in obese vs. normal weight individuals (Greeno, Marcus, & Wing, 1995; Hrabosky et al., 2008; Lowe & Thomas, 2009). For example, internal consistency reliability estimates for the Restraint Scale (Herman & Polivy, 1975) differ among weight categories, with studies reporting *Cronbach's alpha* values that range from .50 to .70 in obese samples, and .78 to .86 in normal weight samples (Gorman & Allison, 1995; Johnson, Lake, & Maurice Mahan, 1983; van Strien, Peter Herman, Engels, Larsen, & van Leeuwe, 2007). Theoretical and empirical studies further indicate that the Restraint Scale has lower internal consistency in overweight samples (Gorman & Allison, 1995; Johnson et al., 1983; Lowe & Thomas, 2009; van Strien et al., 2007). In a large sample of Swedish obese individuals, coefficient alpha values were demonstrated to be lower than values typically found in normal weight samples (van Strien et al., 2007) (but still above the traditional benchmark of .70 for "good" internal consistency in low-stakes testing) for the Three Factor Eating Questionnaire (TFEQ) (Karlsson, Persson, Sjöström, & Sullivan, 2000; Stunkard & Messick, 1985). Additionally, in the same sample of Swedish obese persons, the Cognitive Restraint and Disinhibition scales of the TFEQ demonstrated poor internal consistency relative to internal consistency values typically found in normal weight samples (Karlsson et al., 2000; van Strien et al., 2007). Another study reported consistently lower coefficient alpha values for TFEQ scales for overweight (e.g., ranging from .63 to .67 for each subscale) relative to normal weight (e.g., coefficient alpha values ranging from .69 to .88) individuals (van Strien et al., 2007). Furthermore, significantly different convergent and discriminant correlations among measures of dietary restraint and disinhibited eating (e.g., TFEQ, Dutch Eating Behavior Questionnaire, Restraint Scale) were demonstrated between normal and overweight individuals (van Strien et al., 2007). Another commonly used self-report eating pathology measure is the Eating Disorder Examination Questionnaire (EDE-Q) (Fairburn & Beglin, 2008). In a sample of bariatric surgery candidates, poor convergent and discriminant correlations and low coefficient alpha values emerged for the EDE-Q (Grilo, Henderson, Bell, & Crosby, 2012). One measure that has demonstrated good internal consistency across weight groups is the Dutch Eating Behavior Questionnaire (DEBQ) (van Strien, Frijters, Bergers, & Defares, 1986; van Strien et al., 2007), which may be due, in part, to the fact that the normal weight, overweight, and obese individuals were included in initial scale development and validation samples (van Strien et al., 1986).

Although the literature is suggestive of differential validity of disordered eating self-report questionnaires among weight groups, to our knowledge, no previous study has statistically compared the reliability and validity of common disordered eating self-report measures in overweight or obese vs. matched normal weight individuals, and it remains unclear whether it is appropriate to use these measures in overweight and obese populations. The purpose of this study, therefore, was to compare the internal consistency reliability, convergent validity, and discriminant validity of self-report measures of disinhibited eating and dietary restraint in normal weight vs. overweight and obese individuals. Based on results from previous studies, we hypothesized that the magnitude of convergent and discriminant correlations would be significantly attenuated in the overweight and obese groups compared to the normal weight group; specifically, we expected overweight and obese groups to exhibit significantly lower convergent and discriminant correlations than the normal weight group, because correlations can be expected to be lower in the relative "disadvantaged" group (i.e., overweight and obese groups). We posited that correlations would be lower among overweight/obese participants because several current eating disorder measures did not include (or included very few) overweight or obese persons in the initial scale development and testing process (e.g., see Fairburn & Beglin, 2008; Garner, 2004), and scholars have theorized that the psychometric properties of eating disorder measures may be less than optimal in obese and overweight individuals (Greeno et al., 1995; Hrabosky et al., 2008; Lowe & Thomas, 2009). Additionally, we hypothesized that internal consistency would be lower among individuals who were overweight or obese vs. normal weight. Our second hypothesis is supported by the empirical studies presented above that are suggestive of lower internal consistency reliability among overweight and obese relative to normal weight individuals (Gorman & Allison, 1995; Johnson et al., 1983; Karlsson et al., 2000; Lowe & Thomas, 2009; van Strien et al., 2007).

## Method

### *Participants and procedures*

Participants were normal weight ($N = 510$), overweight ($N = 201$), and obese ($N = 101$) individuals recruited from the community to participate in a study of "health and eating behaviors" (Forbush et al., 2013). Participants were recruited from fliers posted in local community establishments and on buses. We also recruited participants from a mass e-mail to students, faculty, and staff members at a large Midwestern university. Inclusion criteria included age 18 or older and ability to read and write fluently in English. Exclusion criteria were kept to a minimum to obtain representative community data, and were diagnosis of a neurological condition or an intellectual developmental disability. The Institutional Review Board approved study procedures, and participants provided informed consent prior to study enrollment. Consistent with recommendations from the National Heart Lung and Blood Institute (NIH, 1998), participants were classified as normal weight if their self-reported body mass index (BMI) was between 18.50 and 24.99, overweight if their BMI was between 25.00 and 29.99, and obese if their BMI was 30 or greater. Normal weight participants were matched to overweight and obese participants on age, sex, and ethnic minority status (i.e., Non-Hispanic Caucasian vs. any other race or ethnicity). Due to the small sample size of individuals in ethnic-racial minorities, we were not able to match participants within each ethnic category. However, matching on ethnic racial majority vs. minority status is supported by past literature (NIH, 1998; Striegel-Moore, Dohm, Pike, Wilfley, & Fairburn, 2002), and enabled us to maximize power, while still recognizing the potential importance of individual differences related to belonging to an ethnic minority group (Naglieri & Ronning, 2000; Striegel-Moore et al., 2002). Matching procedures resulted in a normal weight sample that was matched to the overweight sample ($N = 201$) and another normal weight sample that was matched to the obese sample ($N = 101$). (Note that 108 normal