



Flexibility in weight management



Essi Sairanen ^{a,*}, Raimo Lappalainen ^a, Anja Lapveteläinen ^b, Asko Tolvanen ^a, Leila Karhunen ^b

^a Department of Psychology, University of Jyväskylä, P.O. Box 35, 40014 University of Jyväskylä, Finland

^b Institute of Public Health and Clinical Nutrition, University of Eastern Finland, Kuopio Campus, P.O. Box 1627, 70211 Kuopio, Finland

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ABSTRACT

The purpose of the study was to investigate the relationships between changes in flexible vs. rigid restraints of eating during weight management, as well as how changes in the cognitive restraint of eating were related to psychological well-being and flexibility. The data includes information on 49 overweight persons who participated in a weight loss and maintenance (WLM) intervention and a follow-up assessment after 8–9 months.

An increase in flexible cognitive restraint during the weight loss intervention was related to better weight loss maintenance and well-being. The more flexible restraint increased during the WLM intervention, the more psychological distress decreased. Moreover, larger reduction of rigid restraint during the follow-up period (between the WLM intervention and the follow-up assessment) was related to a better maintenance of improved psychological well-being at the follow-up endpoint. These results suggest that increasing flexible control while reducing rigid control of eating after an active weight loss phase improves success in weight management and the psychological well-being of weight losers.

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1. Introduction

Many people find it difficult to successfully regulate their eating behavior in the long term, which contributes to the current high rates of obesity. Weight management interventions usually include techniques that are based on behavioral or cognitive self-control models to improve self-efficacy and cognitive restraint of eating. Although cognitive restraint and dietary self-efficacy are considered consistent predictors of weight control (Elfhag & Rössner, 2005), both have been shown to correlate considerably better with short-term weight loss than with long-term weight loss maintenance (Linde, Rothman, Baldwin, & Jeffery, 2006; Teixeira et al., 2006, 2010). Previous studies have also suggested that the relationship between weight control and cognitive eating restraint may change over time: eating restraint may be positive in the short term, but not necessarily in the long run (Teixeira et al., 2010).

It has been shown that dietary restraint is not a homogeneous construct, but includes two distinct cognitive and behavioral styles: rigid control and flexible control of eating behavior (Westenhoefer, 2001). Rigid control is characterized by a dichotomous ‘all or nothing’ approach to eating and weight control, where periods of strict dieting alternate with periods without any weight control efforts. Flexible

control, conversely, is characterized by a graduated ‘more or less’ approach to eating and weight control, which is understood as a long-term or even permanent task. Studies have shown that rigid restraint is consistently associated with higher body mass index (BMI) and poorer weight loss, while flexible restraint is consistently associated with lower BMI and better as well as more sustainable weight loss (Meule, Westenhöfer, & Kübler, 2011; Westenhoefer, 2001; Westenhoefer et al., 2013). As an example, in a study by Teixeira et al. (2010), while dietary restraint (flexible or rigid) predicted short-term weight reduction during an obesity treatment program (after 1 year), only flexible dietary restraint was associated with positive follow-up outcomes (after 2 years).

The results suggest that it is a general non-dichotomous thinking style or behavioral flexibility, rather than dichotomous cognitions related specifically to food, weight and eating, that is the key predictor in weight maintenance (Byrne, Cooper, & Fairburn, 2003; Byrne, Cooper, & Fairburn, 2004). Weight loss was attributable to increased behavioral flexibility, and the more participants increased their behavioral flexibility, the more weight they lost (Fletcher, Hanson, Page, & Pine, 2011). Behavioral flexibility was also negatively related to pre-intervention BMI, indicating that heavier people are more habitual and constrained in the way they behave (Fletcher et al., 2011).

It has been suggested that, essential in weight loss maintenance is an ability to behave flexibly in accordance with one’s personal goals or values (Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Lillis, Hayes, Bunting, & Masuda, 2009). Research has shown that individuals who are unable to maintain weight loss tend to use avoidant (Byrne et al., 2003) or impulsive styles of coping (Fassino et al., 2002; Lillis & Hayes,

* Corresponding author. Tel.: +358 40 8054517.

E-mail addresses: essi.sairanen@jyu.fi (E. Sairanen), raimo.lappalainen@jyu.fi (R. Lappalainen), anja.lapvetelainen@uef.fi (A. Lapveteläinen), asko.tolvanen@jyu.fi (A. Tolvanen), leila.karhunen@uef.fi (L. Karhunen).

2008; Rydén et al., 2003) in response to stress or negative emotions, and frequently use eating to regulate emotions (Byrne et al., 2003). By contrast, those who successfully control their weight show more active, flexible and committed styles of adjustment (Westenhoefer, 2001). The growing body of evidence suggests that experiential avoidance is a central process in the development of a range of mental health and behavioral health problems; meaning that, when confronted with difficult thoughts and feelings, some people tend to try and change or avoid these private experiences in an effort to regulate their behavior (Hayes et al., 2006; Lillis & Hayes, 2008). Cognitive rigidity, as well as rigid eating restraint, can be seen as this kind of coping strategy aimed at controlling private events.

As an opposite to experiential avoidance, psychological flexibility refers to an ability to focus on the present moment and, depending on what the situation affords, to persist with or change one's (even inflexible, stereotypical) behavior in the pursuit of goals and values (Hayes, Strosahl, & Wilson, 1999; Hayes et al., 2006). Consistent with conceptualization of psychological flexibility, there are now plenty of studies that show that this characteristic predicts outcomes such as mental and physical health (for the complete findings of this meta-analysis, see Hayes et al., 2006). Forman et al. (2007) found that coping strategies based on acceptance were more effective than those based on emotional control in dealing with food cravings for those who were strongly impacted by food. Moreover, increased psychological flexibility led to stigma reduction, weight loss, and improvements in the quality of life of obese weight losers participating in a one-day workshop concerning mindfulness and acceptance (Lillis et al., 2009).

In previous study of Karhunen et al. (2012), it was observed that behavioral and psychological factors rather than dietary factors played the main role in the success of individuals' weight management, which is in line with the review of the weight maintenance data that concluded that the issue of weight control should be viewed primarily from a psychological viewpoint (Elfhag & Rössner, 2005). More specifically, short-term (24 weeks) success in weight loss maintenance following a very low calorie diet (VLCD) was associated with a greater increase in the flexible control of eating and a greater decrease in uncontrollable eating and psychological distress (Karhunen et al., 2012). The purpose of the present study was to further examine these psychobehavioral factors in weight management, especially the more long-term effects of flexible and rigid restraint of eating on weight loss maintenance and well-being, as well as their relations to psychological flexibility. The aim was to achieve an understanding about the mechanism of change during weight maintenance, especially related to control and flexibility.

Based on theory and prior research (Byrne et al., 2003; Fletcher et al., 2011; Hayes et al., 2006; Westenhoefer, 2001), it was hypothesized that an increase in flexible cognitive restraint of eating during a weight loss and maintenance program and a follow-up period of 8–9 months would be positively associated with better long-term weight management, whereas an increase in rigid cognitive restraint would be related to poorer long-term weight management. Moreover, based on previous literature (Bacon, Stern, Van Loan, & Keim, 2005; Lillis et al., 2009), it was hypothesized that a greater increase in flexible restraint during weight loss and maintenance periods would be positively correlated to higher self-efficacy, psychological flexibility and well-being during the follow-up period, whereas rigid restraint would predict poorer self-efficacy, psychological flexibility, and well-being.

2. Methods

2.1. Participants and procedure

Originally 99 (28 males, 71 females) obese (inclusion criteria being body mass index (BMI) 30–40 kg/m², age 30–65 years) subjects were recruited into the weight loss and maintenance intervention study (WLM intervention; Karhunen et al., 2012). They were recruited by an

announcement in a local newspaper and among the eligible subjects who had participated previously in the studies performed at the University of Kuopio, Finland (currently University of Eastern Finland).

The study design and the main results of the WLM intervention are described in detail by Karhunen et al. (2012). In brief, the WLM intervention consisted of two phases. The first phase was a seven-week weight loss period requiring the intake of only very low calorie diet (VLCD) products. During the weight-loss period the subjects were given dietary counseling in group sessions, 7 times during whole period. In the group sessions, different themes were discussed, like energy requirements and energy consumption, physical exercise, meal rhythm and barriers for weight management.

In the second phase, after the weight loss period the subjects were randomized into two diet groups: Higher-Satiety Food group (HSF) and Lower-Satiety Food group (LSF). The subjects in the HSF consumed the test foods with higher satiety value, and the subjects in the LSF consumed the test foods with lower satiety value as a part of their weight-management diet, during which subjects were instructed to maintain their weight loss, but not to continue actively losing weight. The test foods aimed to cover about 30% of the individually estimated daily energy requirements. During this period of 24 weeks, the subjects received the test foods in every two weeks in a visit, where the subjects' body weight was measured and they were given written instructions about the use of the test foods as well as the weight-management diet in general.

Altogether 82 subjects completed the WLM intervention, and about 8–9 months after the end of the WLM intervention, the participants were asked to take part in a follow-up assessment about which they had not been informed beforehand. The population of the present study consists of 60% of persons who completed the WLM intervention and participated in the follow-up assessment ($n = 49$). There were no significant differences in the background variables (gender, age, education, BMI, or weight loss during the WLM) between those subjects who participated in the follow-up assessment ($n = 49$) and those who did not ($n = 33$) (data not shown).

The mean age of the participants was 51.4 ± 9.1 years (range 31–63), and the median of the BMI at the time of the follow-up assessment was 30.7 kg/m^2 (IQR = 28.7–33.4). All participants were of Finnish origin. The majority of the participants had an upper secondary education (59.1%) and 24.5% had a university degree.

The study was performed in accordance with the standards of the Helsinki Declaration. The Ethics Committee of the District Hospital Region of Northern Savo and Kuopio University Hospital approved the study plan, and all participants gave their written informed consent for their participation in the study.

2.2. Measurements

The Three-Factor Eating Questionnaire (TFEQ) was used to measure flexible and rigid control of cognitive eating restraint (Westenhoefer, Stunkard, & Pudel, 1999). The original TFEQ including 51 questions was used. Flexible cognitive restraint (7 items) is associated with low emotional and disinhibited eating, with a higher score indicating a more graduated 'more or less' approach to eating and weight control (e.g., "When I have eaten my quota of calories, I am usually good about not eating any more"). Rigid cognitive restraint (7 items) is associated with a dichotomous 'all or nothing' eating pattern and with higher disinhibition (e.g., answering "Yes" to "Do feelings of guilt about overeating help you to control your food intake?" or "I count calories as a conscious means of controlling my weight"). The Flexible and Rigid control subscales have been shown to have favorable psychometric properties and good predictive validity (Westenhoefer et al., 1999).

Psychological well-being vs. distress was evaluated using the General Health Questionnaire (GHQ-12; Goldberg, 1978), which measures overall psychological health or level of mental complaints.

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