



## Research report

# Ambivalence toward palatable food and emotional eating predict weight fluctuations. Results of a longitudinal study with four waves



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## ABSTRACT

Weight fluctuations pose serious challenges to people's health. Research suggests that the interplay between cognitive dietary restraint and counter-regulative overeating impairs weight control. In a random sample from the general population ( $N = 2733$ , 49% male), a longitudinal survey was conducted over 4 consecutive years (2010–2013). Self-reported weight was used to calculate the variance of three weight changes from one wave to the next. Separate regression analyses for women and men were conducted. The dependent variable was weight fluctuation, and the independent variables were eating styles (emotional, external, and restrained) and ambivalence toward palatable food. Age and weight changes between the fourth and first years were controlled. A significant positive effect of emotional eating for men and women, and a significant positive effect of ambivalence for women, were found. Participants who demonstrated high levels of emotional eating, and women who had high levels of ambivalence in the beginning of the study, had more extreme relative weight fluctuations in the consecutive years than did persons with low levels of emotional eating or women with low levels of ambivalence. Restrained and external eating had no effect. The results suggest that emotional eating and ambivalence toward palatable food need to be addressed to prevent health-damaging weight fluctuations. Furthermore, ambivalence toward palatable food was revealed as an additional overeating tendency beyond emotional eating that must be considered to understand the interplay between dietary restraint and overeating.

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## Introduction

Weight fluctuations (i.e., the repetitive losing and regaining of weight) are prevalent in normal-weight and overweight people and may pose a severe health risk (Brownell & Rodin, 1994; Elfhag & Rossner, 2005; Jeffery, McGuire, & French, 2002). Variability in body weight is related to increased mortality due to cardiovascular and coronary heart diseases (Brownell & Rodin, 1994). Additionally, weight fluctuations have been associated with weight gain over the long term (Jeffery et al., 2002; van Strien, Herman, & Verheijden, 2014). Therefore, it is important to unveil the factors that influence people's weight fluctuations.

Research suggests an interplay among the eating styles of dietary restraint and counter-regulative disinhibition and overeating in response to emotional and external food cues, and that this interplay can impair weight control (Fedoroff, Polivy, & Herman, 1997; French, Epstein, Jeffery, Blundell, & Wardle, 2012; Heatherton, Polivy, & Herman, 1991; Koenders & van Strien, 2011). However, results from previous research regarding the effects on weight are inconsistent. This might be due to the mostly cross-sectional and rare

longitudinal studies. Many studies examined specific samples, including overweight participants, students, participants in intervention studies, and women alone (French et al., 2012). The few longitudinal studies using samples from the general population focused on weight gain between two or more measurement points (Chaput et al., 2009; de Lauzon-Guillain et al., 2006; Savage, Hoffman, & Birch, 2009; van Strien et al., 2014). Therefore, whether restrained eating among people from the general population is related to weight fluctuations is an open question. Such weight fluctuations can but do not always, result in weight gain. Weight fluctuation is a different endpoint that should be examined but had been ignored in past studies. In the present study, we examined the influence of the eating styles of dietary restraint, and emotional, and external eating on weight fluctuations over 4 consecutive years utilizing a sample from the general population. We also examined the counter-regulative effects of ambivalence toward eating due to the incompatibility of the two goals of dieting and the enjoyment of food (Stroebe, Mensink, Aarts, Schut, & Kruglanski, 2008).

*Eating styles and weight changes*

Dietary restraint is the cognitive control of food intake to lose weight or to maintain a reduced weight (Fedoroff et al., 1997; Stroebe et al., 2008; van Strien, Frijters, Bergers, & Defares, 1986).

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Restrained eaters are characterized by insensitivity to internal cues (e.g., feelings of satiety) and compensatory overdependence on cognitive and external cues from the environment (Fedoroff et al., 1997). When cognitive control is impaired (e.g., by emotional arousal or external cues, such as smell or taste), restrained eaters overeat (Fedoroff et al., 1997; see Stroebe et al., 2008 for an overview). Due to the cycle of dieting and overeating, dietary restraint has been suggested as an explanation for weight fluctuations (Heatherton et al., 1991). The researchers analyzed the daily and weekly weight fluctuations of 24 female students over 6 weeks and again 6 months after the beginning of the study. The results indicated that dietary restraint and self-reported weight fluctuations predicted weight variability. Weight fluctuations were shown to be consequences of a cycle of dieting and overeating (Heatherton et al., 1991). Other studies on dietary restraint that examined weight gain (not weight fluctuations) found inconsistent results. In samples from the general population, baseline dietary restraint predicted individuals' weight gain 6 years after the baseline was measured (Chaput et al., 2009) or 3 years after the baseline was measured in some women but not in men (van Strien et al., 2014). Other researchers found that initial dietary restraint had no effect on weight change 2 years later (de Lauzon-Guillain et al., 2006; Koenders & van Strien, 2011). More consistent results were found for overeating or the disinhibition tendency to eat in response to emotional cues. A review of the longitudinal research suggested that disinhibition was the most consistent predictor of weight gain (French et al., 2012). Initial emotional eating predicted weight gain, but external eating did not, indicating that negative emotions rather than external eating predicted gain weight (Koenders & van Strien, 2011). However, restrained eating, which was also examined in the same study, did not predict weight gain (Koenders & van Strien, 2011). Negative emotions evoked by stress drove disinhibited eating, binge eating, and eating more palatable foods and fewer vegetables and whole-grain foods (Groesz et al., 2012). However, to the best of our knowledge, the impact of dietary restraint and overeating tendencies on weight fluctuations in the general population have not been examined.

#### *Ambivalence toward eating palatable food and weight change*

The goal conflict model (Stroebe et al., 2008) was used to address the question of why restrained eaters are tempted to eat palatable food. It suggested that restrained eaters had goals of dieting but at the same time, they also anticipated the pleasures of eating. Accordingly, exposure to palatable foods activated the goal of eating enjoyment and resulted in inhibition of the weight control goals of restrained but not normal eaters (Stroebe et al., 2008). Due to the conflict between the goal of dieting and eating enjoyment, restrained eaters have an ambivalent attitude toward eating palatable food (Stroebe et al., 2008). Ambivalence is defined as holding mixed (positive and negative) feelings toward a stimulus (Conner & Sparks, 2002). Restrained eaters “love good food for its taste, but, at the same time fear it because of its calories” (Stroebe et al., 2008, p. 29). Supporting this notion, two studies associated restrained eating with ambivalence toward eating palatable food among female students (Stroebe et al., 2008) and among people from the general population (Keller & van der Horst, 2013). This latter cross-sectional study also found a positive relationship between ambivalence toward eating palatable food and body mass index (BMI) (Keller & van der Horst, 2013).

#### *Rationale of the present study*

The goal of the present study was to examine whether eating styles (van Strien et al., 1986) and ambivalence toward eating palatable food (Stroebe et al., 2008) influenced weight fluctuations over

4 consecutive years. We hypothesized that emotional eating and the goal conflict manifested in ambivalence toward eating palatable food could predict increased weight fluctuations. Past research indicated that emotional eating predicted overconsumption of food in response to negative emotions and stress (Kuijjer & Boyce, 2012; van Strien et al., 2013) as well as weight gain over the long term (French et al., 2012; Koenders & van Strien, 2011). It seems plausible, however, that the circumstances evoking negative emotions vary. Consequently, the extent to which an emotional eater consumes high-calorie foods in response to (varying) negative emotions may also vary.

Varied disinhibition and (lack of) self-control are captured by the tendency to overeat. The measurement instruments for assessing dietary restraint developed by van Strien et al. (1986) aimed to disentangle the confounding factors of disinhibition (manifested in overeating tendencies related to emotional and external eating) from dietary restraint. Items related to disinhibition and overeating were excluded from dietary restraint: separate scales for emotional and external eating were developed instead (Johnson, Pratt, & Wardle, 2012; van Strien et al., 1986). This measurement instrument thus assessed food intake control as the act of eating less after having eaten too much rather than disinhibition and overeating, which in fact might have been the factor that resulted in weight cycling and precluded weight loss despite dieting (Heatherton et al., 1991). Therefore, we do not expect dietary restraint to influence weight fluctuations. Neither do we anticipate external eating to affect weight fluctuations since in previous longitudinal studies external eating was not a predictor of weight change (Koenders & van Strien, 2011).

A person who experiences ambivalence toward eating palatable food may fear its calories because he or she recognizes the temptation to eat the (mostly high-caloric) food. In terms of the goal conflict model (Stroebe et al., 2008), the person fears the disinhibition of the eating goal and the inhibition of the diet goal in tempting situations. Under normal conditions restrained eaters (and thus, people who experience ambivalence) exercise automatic self-control by inhibiting or devaluing tempting food; however, repeated confrontations with tempting food exhaust the self-control of restrained eaters; they then become responsive to tempting foods but normal eaters do not (Hofmann, van Koningsbruggen, Stroebe, Ramanathan, & Aarts, 2010). Keeping the diet goal activated and the eating enjoyment goal inhibited in repeated tempting situations require self-control resources (Stroebe, van Koningsbruggen, Papies, & Aarts, 2013). This case may apply significantly to persons with high levels of ambivalence. Self-control resources may sometimes be depleted, which can result in disinhibition of the eating enjoyment goal and thus, in overconsumption of palatable food and subsequent weight gain. However, in phases of recovered high self-control resources ambivalent people may eat less. Therefore, it is likely that ambivalence is positively related to weight fluctuations.

## **Methods**

### *Participants*

The present study analyzed data from the Swiss Food Panel, a population-based longitudinal study of the eating behavior of the Swiss population. In 2010, a mail survey was sent out to 20,912 household addresses randomly selected from the telephone book in the German- and French-speaking regions of Switzerland. In the first wave (2010), 6290 of the invited participants completed the food panel questionnaire (response rate 30%). Each participant received another questionnaire in February of each consecutive year (2010–2013). Respondents whose surveys did not include gender, age, or address details, those who had died, those unwilling to participate in the next survey, and those who completed less than 50%

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