

Emotional Openness, Problematic Eating Behaviours, and Overweight in Adolescents

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Abstract

Overweight, a common health condition in adolescence, has been linked with difficulties in emotional processing. This study investigates associations between emotional processing, conceptualised through the model of Emotional Openness (EO), problematic eating behaviours, including Eating in the Absence of Hunger and disinhibited eating, and overweight in adolescents. Several self-report instruments were completed by 160 youngsters (mean age: 14.36 ± 0.61 years) from the community, including 39 overweight and obese adolescents (24.5%). In girls, bootstrap analyses supported a mediating effect of restrained eating on the relation between three EO dimensions and body mass index percentile, in particular the communication of emotions, the cognitive-conceptual representation of emotions, and the perception of bodily indicator of emotions. No mediating effect was found in boys. These results have important implications for psychological weight management interventions, as they underline the relevance of work on emotional processing in order to reduce problematic eating behaviours.

Keywords

overweight; problematic eating behaviours; emotional processing; Emotional Openness; adolescence; gender.

1. Introduction

Overweight, a common condition in adolescence (25% in Switzerland, including 5% of obesity; Bovet, Chiolero, & Paccaud, 2008 and 5%), is a complex disorder resulting from the interaction of multiple factors (Delgrande Jordan, Kuntsche, & Gmel, 2007). Research suggested that genetic factors may influence overweight through behavioural tendencies (Faith & Keller, 2004), in particular problematic eating behaviours (PEBs). Faith and colleagues (2006) identified Eating in the Absence of Hunger (EAH) as a genetically programmed eating behaviour contributing to childhood obesity. EAH, defined as eating when not physiologically hungry (Fisher & Birch, 1999), was associated with overweight in both children (Fisher & Birch, 1999) and adolescents (Shomaker et al., 2010), but with some gender differences in children (Faith et al., 2006; Moens & Braet, 2007). Tanofsky-Kraff and colleagues (2008) identified three dimensions of EAH, referring to three prompting factors: negative emotions, external factors, and fatigue or boredom (see Method section). Obese children and adolescents exhibited more EAH in response to negative emotions compared to normal weight controls (Tanofsky-Kraff et al., 2008).

EAH is similar to disinhibited eating patterns observed in adults, characterised by eating in response to cues other than hunger (Stunkard & Messick, 1985), and including three behaviours: emotional, external, and restrained eating (van Strien, Frijters, Bergers, & Defares, 1986; see Method section). Associations between these three PEBs and overweight are quite well documented in adults (van Strien & Koenders, 2012), but the evidence is less conclusive in adolescents: Some research found gender-specific associations (Braet et al., 2008; Snoek, van Strien, Janssens, & Engels, 2007), other research discovered negative associations (Snoek, van Strien, Janssens, & Engels, 2007), or even no association (van Strien, Herman, & Verheijden, 2009).

Genetic influences on obesity could be explained by temperament, representing biologically based individual differences in psychological processes, which determine our behavioural tendencies (Rothbart & Bates, 2006). Emotional processing, “the self-organization and explication of one’s own emotional experience” (Greenberg, 2006, p. 87), is considered as a temperament disposition (Rothbart & Sheese, 2007). Research highlighted associations between maladaptive emotional processing and obesity in adolescent girls (Rehkopf, Laraia, Segal, Braithwaite, & Epel, 2011) and women (Zijlstra et al., 2011). In a recent study (Walther & Hilbert, in press), we did not find any significant association between adolescent overweight and Emotional Openness (EO; Reicherts, 2007; Reicherts, Genoud, & Zimmermann, 2012), a generic model assessing emotional processing as represented by the subject (see Method section). This study therefore focuses on PEBs, in order to determine if they mediate the association between EO and overweight. In fact, PEBs may be triggered by difficulties in understanding somatic sensations, especially in differentiating physiological cues of hunger from bodily indicators of emotions (Bruch, 1964; van Strien & Ouwens, 2007), which may lead people to overeat in order to reduce discomfort due to negative emotions (emotional eating; Kaplan & Kaplan, 1957; Koenders & van Strien, 2011) or to rely on external cues to regulate food intake (external eating; Schachter, Goldman, & Gordon, 1968; Wansink, Payne, & Chandon, 2007). These difficulties may be reflected by a particular EO profile, characterised by a lower level of cognitive-conceptual representation of emotion, a greater awareness of bodily indicators of emotions, and by lower levels of regulation and communication of emotions.

We thus hypothesise that PEBs will mediate associations between EO dimensions and BMI percentile. More specifically, we expect that representation, regulation and communication of emotions will negatively predict PEBs, and that perception of bodily

indicators of emotions will positively predict PEBs; then that PEBs will positively predict BMI percentile.

2. Method

2.1. Recruitment and Sample

Participants were recruited through the French-speaking schools' medical service in Fribourg (Switzerland), during the mandatory medical examination. Ethical approval was granted by the Ethics Committee of the Department of Psychology of the University of Fribourg.

Participation in the study was proposed to 400 adolescents. Of these, 164 completed the assessments (response rate: 41%). After exclusion of participants who spoke French for less than three years, the final sample consisted of 160 adolescents aged between 13 and 16 ($M = 14.36 \pm 0.61$). Table 1 summarise the main sociodemographic characteristics.

Insert Table 1 here.

2.2. Instruments

Three self-report questionnaires with established reliability and validity were selected for this study:

PEBs pertaining to disinhibited eating were assessed through the French version of the Dutch Eating Behaviour Questionnaire (DEBQ; Van Strien, Frijters, Bergers, & Defares, 1986) validated by Lluh and colleagues (1996). It contains three dimensions: the *Emotional Eating Scale* evaluates the tendency to eat in response to negative emotions; the *External Eating Scale* refers to eating in response to food-related stimuli; and the *Restrained Eating Scale* assesses the tendency toward food restriction, leading to periodical overeating episodes.

PEBs referring to EAH were explored through a French translation of the Eating in the Absence of Hunger Questionnaire for Children and Adolescents (EAH-C; Tanofsky-Kraff et al., 2008). It contains three dimensions, assessing EAH in two circumstances, when one continues to eat past satiation, and when one initiates eating when not hungry; the *Negative Affect Eating Dimension* considers three emotions (sad/depressed, angry/frustrated, anxious/nervous); the *External Eating Dimension* takes into account two external precipitants, that is, sensory cues (smell or sight of food) and social cues (being in the presence of other people eating); and the *Fatigue/Boredom Eating Dimension* refers to eating when tired or bored.

Emotional processing was measured through the original French version of the Dimensions of Openness to Emotions (DOE-20; Reicherts, 2007), which includes five dimensions: the *Cognitive-Conceptual Representation of Emotions Dimension* focuses on emotion representations, based on mental and bodily states; the *Communication of Emotions Dimension* refers to the capacity to express and share emotions with others; the *Perception of Internal Bodily Indicators Dimension* represents the awareness of the internal somatic phenomena accompanying emotions; the *Perception of External Bodily Indicators Dimension* refers to the awareness of bodily indicators visible from the outside; and the *Regulation of Emotions Dimension* represents the capacity of regulating, monitoring, or postponing emotions.

2.3. Statistical Analyses

In order to test the effect of PEBs on the association between EO and BMI percentile, a mediation analysis was conducted using bootstrapping (Shrout & Bolger, 2002). An SPSS macro (Preacher and Hayes, 2004; 2008) allowing to evaluate indirect effects in case of multiple independent variables was used, which tested the effect of each independent variable,

while controlling for the others (considered as covariates). Bootstrap resamples were done 1000 times. Analyses were conducted for boys and girls separately, and the macro was run once for each EO variable, with the four other variables considered as covariates, five times for boys and five times for girls. The results were interpreted according to the nonzero coefficients method, using a 95% confidence interval.

EO variables were considered as independent variables, BMI percentile as the dependent variable, and PEBs as mediators. As some PEBs were conceptually similar and highly correlated, which is not recommended for mediators (Kenny, Kashy, & Bolger, 1998), they were grouped together via a principal component analysis: the Emotional Eating Scale of the DEBQ, and the Negative Affect Eating and Fatigue/Boredom Eating Scales of the EAH-C were clustered to form a variable representing the tendency to eat in response to negative emotions; the External Eating Scales from the DEBQ and from the EAH-C were grouped together to form a variable focusing on the tendency to eat in response to sensory properties of food; finally, the Restrained Eating Scale of the DEBQ stayed as a unique variable representing the tendency to dietary restraint.

3. Results

Bootstrap results highlighted no significant indirect effect in boys. In girls, however, restrained eating significantly mediated the association of communication of emotions ($ab_1 = -.0539$, 95% CI [-.0961, -.0200]), representation of emotions ($ab_2 = .0473$, 95% CI [.0129, .0917]), and perception of internal bodily indicators of emotions ($ab_3 = .0394$, 95% CI [.0064, .0808]) on BMI percentile. The communication of emotions negatively predicted restrained eating ($a_1 = -.34$), while the representation of emotions ($a_2 = .29$) and the perception of bodily indicators ($a_3 = .25$) positively predicted restrained eating; restrained eating ($b = .16$), in turn, positively predicted BMI percentile (see Figure 1).

Insert Figure 1 here.

4. Discussion

The main finding of this study was the mediating effect of restrained eating on the association between EO and overweight in girls for three EO dimensions: Lower abilities in communicating emotions led to a greater tendency to restrained eating, while higher abilities in representation of emotions and a heightened awareness of bodily indicators of emotions contributed to greater restrained eating, which, in turn, predicted more overweight. This positive influence of restrained eating on overweight corroborates our hypotheses and partially supports earlier research, since associations between restrained eating and obesity were sometimes found only in adolescents girls (Wardle et al., 1992), and sometimes in adolescents of both genders (Snoek et al., 2007; Stice, Presnell, Shaw, & Rohde, 2005; Wardle et al., 1992).

The negative effect of communication of emotions on restrained eating is consistent with our expectations and with Restraint Theory (Herman & Polivy, 1980), which stipulates that constant food restriction may result in a state of chronic hunger leading people to periodically experience episodes of overeating when exposed to disinhibitors. Many authors demonstrated that negative emotions constitute disinhibitors inducing overeating in restrained eaters (e.g., Herman & Polivy, 1980), because overeating, momentarily neutralising dysphoria, represents a way to cope with emotions (Polivy, Herman, & McFarlane, 1994). As communicating emotions also enables their regulation (Reichert, Genoud & Zimmermann, 2012), people possessing low abilities in communicating emotions may try to regulate them by eating, which contributes to overeating episodes.

Finally, while the positive influence of perception of bodily indicators of emotions on overweight confirms our hypotheses, this is not the case for the positive effect of

representation of emotions, which was expected to be negative. Nevertheless, both results can be connected with restrained eating. According to Van Strien et al. (1986), this PEB is due to the incessant fight against hunger, which results in a loss of contact with internal sensations of hunger. As the DOE-20 focuses on individuals' self-representations of their emotional processing, and not on actual measures of it (Reichert, Genoud & Zimmermann, 2012), higher scores in awareness of bodily indicators and in representation of emotions may reflect an excessive focus on emotional processing, leading restrained eaters to misinterpret somatic cues of hunger as due to emotions, increasing even more the loss of contact with cues of hunger, and contributing thus to overeating episodes.

The lack of significant results in boys suggest that they are less prone to disinhibited eating than girls, which is consistent with clinical data on higher prevalence of binge-eating (Croll, Neumark-Sztainer, Story, & Ireland, 2002; Decaluwé, Braet, & Fairburn, 2003) and loss of control over eating (Elliott et al., 2010; Goldschmidt et al., 2008) in girls and female adolescents.

Regarding implications of this study, the absence of significant results for PEBs pertaining to externality and emotionality may benefit from further exploration. It may be useful to replicate our analyses with other temperament dispositions, such as reactive and regulative temperament. Since emotional processing keeps on developing during adolescence to reach its definitive form at the beginning of adulthood (Zimmermann, 2012), reactive and regulative temperament may be more relevant concepts to assess emotional processing, as these dispositions, present early in life, underlie its development (Rueda & Rothbart, 2009). Concerning clinical implications, this study suggests that in order to reduce PEBs, and consequently to help preventing overweight, it may be beneficial to focus on emotional processing. Intervention modules aiming at improving EO competences, which can be implemented in various psychotherapeutic approaches, have shown to be effective for various

mental disorders (Reichert, Pauls, Rossier, & Haymoz, 2012). Developing the communication and the regulation of emotions may be especially relevant, as well as reducing the excessive focus on emotions by teaching restrained eaters how to distinguish between somatic sensations produced by emotions and those induced by hunger.

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Table 1

Sociodemographic characteristics

	N	%
Gender		
Girls	93	58%
Boys	67	42%
Schooling		
Lowest stream	22	13.8%
Middle stream	60	37.5%
Highest stream	78	48.8%
Nationality		
Swiss	109	68.1%
Other	51	31.9%
Native language		
French	115	71.9%
Other	43	26.9%
Body mass index status		
Underweight (< 10 th percentile)	10	6.3%
Normal weight (10 th - 89 th percentiles)	110	69.2%
Overweight (\geq 90 th percentile)	39	24.5%
Including obese (\geq 95 th percentile)	17	10.4%

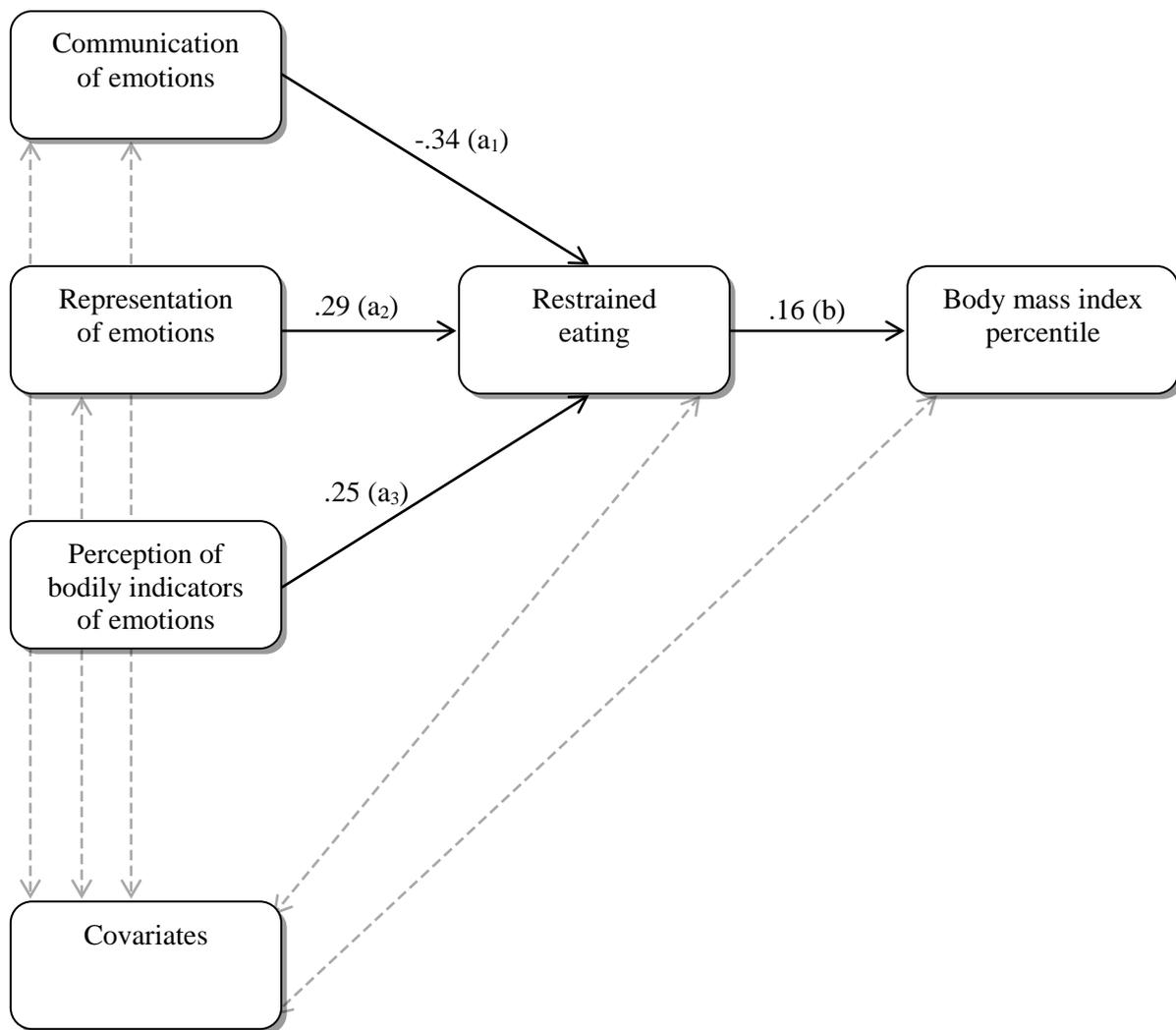


Figure 1. The path diagram illustrating the effect of cognitive-conceptual representation, communication and perception of bodily indicators of emotions on body mass index percentile mediated by restrained eating in adolescent girls.