



Implicit cognitive processes in binge-eating disorder and obesity[☆]



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ABSTRACT

Objectives: Binge-eating disorder (BED) is characterized by recurrent binge eating episodes, associated eating disorder and general psychopathology, and commonly occurs in obese individuals. Explicit self-esteem and explicit weight bias have been linked to BED, while little is known about implicit cognitive processes such as implicit self-esteem and implicit weight bias.

Methods: Obese participants with BED and an individually matched obese only group (OB) and normal weight control group (CG; each $N = 26$) were recruited from the community to examine group differences and associations in explicit and implicit self-esteem and weight bias, as well as the impact of implicit cognitive processes on global eating disorder psychopathology. Implicit cognitive processes were assessed using the Implicit Association Test.

Results: Significantly lower explicit self-esteem, as well as higher exposure to explicit weight bias, compared to CG and OB was found in the BED group. All groups showed positive implicit self-esteem, however, it was significantly lower in BED when compared to CG. BED and CG demonstrated equally high implicit weight bias whereas OB did not. Explicit and implicit measures were not significantly correlated. Global eating disorder psychopathology was predicted by explicit and implicit self-esteem.

Conclusions: The results of the present study add to the importance of implicit self-esteem and implicit weight bias beyond explicit measures in BED, while both were previously shown to be associated with onset and maintenance of BED. In conclusion, implicit cognitive processes should be focused on in interventions for BED to investigate their impact on psychological treatments.

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1. Introduction

Since the publication of research criteria for binge-eating disorder (BED) in the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, APA, 1994), substantial research on various aspects of BED led to the inclusion of BED in the recently published DSM-5 (APA, 2013). BED is characterized by recurrent binge eating episodes including eating large amounts of food accompanied by a sense of lack of control over eating that occurs in the absence of compensatory behaviors. BED is associated with lower quality of life, and increased eating disorder and general psychopathology. Further, BED commonly occurs in obese individuals, however, BED and obesity (defined as body mass index [BMI] ≥ 30 kg/m²) represent distinct phenomena (APA, 2013).

Various cognitive processes have been conceptualized as factors for the onset and maintenance of BED (e.g., Fairburn, Cooper, & Shafran, 2003; Wilfley, Pike, & Striegel-Moore, 1997). Further, substantial evidence highlighted the importance of self-esteem (SE) and exposure to weight bias (WB) as cognitive processes contributing to BED. Low SE has repeatedly been shown to be a predictor for BED in cross-sectional and longitudinal studies (Goldschmidt, Wall, Loth, Le Grange, & Neumark-Sztainer, 2012; Grilo, White, & Masheb, 2012), and has also been found in obesity (Griffiths, Parsons, & Hill, 2010). High rates of exposure to WB, defined as being stigmatized because of one's weight, repeatedly predicted binge eating (Ashmore, Friedman, Reichmann, & Musante, 2008) and binge eating onset (Goldschmidt et al., 2012).

However, individuals might lack self-insight, deceive others or even themselves in self-report measures on SE and WB (Wilson, Lindsey, & Schooler, 2000). Therefore, previous research provided an elaborated theoretical dual-model approach comprising two structurally distinct systems of information processing that encompasses explicit and implicit evaluations (e.g., Strack & Deutsch, 2004). Thus, explicit SE and explicit WB are understood as

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deliberate, accessible and mentally represented information in a reflective system that can be assessed with self-report measures. However, implicit SE and implicit WB are automatic and not necessarily conscious evaluations in an impulsive system. A reliable and valid measure of implicit evaluations is the Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998). Previous research revealed typically weak correlations between implicit and explicit measures (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). Furthermore, implicit measures have been found to demonstrate additional predictive power as they predicted spontaneous impulsive behavioral responses that explicit measures were not able to predict (e.g., Roefs et al., 2011; Rudolph, Schröder-Abé, Riketta, & Schütz, 2010). Thus, it is necessary to examine explicit and implicit cognitions in BED.

Research on implicit SE in eating disorders is rare and findings have been inconsistent. While implicit SE did not differ in restrained and unrestrained eaters (Hoffmeister, Teige-Mocigemba, Bleichert, Klauer, & Tuschen-Caffier, 2010), participants with bulimia nervosa were found to have higher implicit SE compared to healthy controls (Cockerham, Stopa, Bell, & Gregg, 2009). In contrast, lower – albeit positive – implicit SE when compared to healthy controls was reported in patients with depression (Risch et al., 2010) and body dysmorphic disorder (Buhlmann, Teachman, Naumann, Fehlinger, & Rief, 2009). Previously, implicit WB was demonstrated in normal weight (Watts & Cranney, 2009) and obese samples (Carels et al., 2010). In BED, implicit WB has not been studied yet, however, implicit WB was found to be a predictor of binge eating in weight loss treatment seeking individuals (Carels et al., 2010).

Based on the findings above, our aim was to investigate effects of eating disorder psychopathology and obesity on explicit and implicit cognitive processes. Thus, we examined obese participants diagnosed with BED (BED group), obese participants without an eating disorder diagnosis (OB group), and normal weight participants without an eating disorder diagnosis in a control group (CG). First, we expected the BED group to show lower explicit SE and to explicitly report higher exposure to WB compared to the OB group and CG. Additionally, when comparing the BED group to the OB group and the CG we predicted lower implicit SE but no differences in implicit WB. Second, we expected weak correlations between explicit and implicit measures of SE and WB. Finally, we explored whether and to what extent implicit cognitive processes possessed incremental validity over and above explicit cognitive processes in the prediction of global eating disorder psychopathology.

2. Method

2.1. Participants and recruitment

Seventy-eight participants (63 women, 80.8%) older than 18 years of age and with sufficient German language skills were recruited from the community and offered € 40 for participation. Participants in the three groups were individually matched according to sex, age, and education, revealing three groups of equal sizes ($N = 26$). Additionally, the BED and OB group participants were matched according to their BMI.

Inclusion criteria in the BED group were a diagnosis of BED according to DSM-5 criteria (APA, 2013), and a BMI in the obese category ($\text{BMI} \geq 30 \text{ kg/m}^2$). Inclusion in the OB group required a $\text{BMI} \geq 30 \text{ kg/m}^2$, and the CG had to be of normal weight ($18.5 \text{ kg/m}^2 < \text{BMI} < 24.9 \text{ kg/m}^2$). Exclusion criteria in the OB group and CG included reports of any episodes of binge eating or inappropriate compensatory behavior within the last six months.

2.2. Measures

2.2.1. Eating disorder examination (EDE)

The diagnostic items of the semi-structured EDE interview (German version: Hilbert, Tuschen-Caffier, & Ohms, 2004) were used for BED diagnosis. Good reliability ($0.73 \leq \text{Cronbach's } \alpha \leq 0.93$) and validity have been established for the original and German version.

2.2.2. Eating disorder examination-questionnaire

(EDE-Q; German version: Hilbert, Tuschen-Caffier, Karwautz, Niederhofer, & Munsch, 2007). Specific eating disorder psychopathology within the past 28 days was assessed with the 28 item EDE-Q (0 = *not at all* to 6 = *markedly*) comprised of four mean scores for subscales (restraint, eating concern, weight concern, and shape concern) and global eating disorder psychopathology. The EDE-Q demonstrated excellent reliability (Cronbach's $\alpha = 0.95$) in the current study.

2.2.3. Rosenberg self-esteem scale

(RSES; German version: von Collani & Herzberg, 2003). Explicit self-esteem, the overall liking of oneself, was measured using the sum score of the ten item RSES (1 = *strongly disagree* to 4 = *strongly agree*). The RSES showed excellent reliability (Cronbach's $\alpha = 0.92$).

2.2.4. Stigmatizing situations inventory

(SSI; Myers & Rosen, 1999). The SSI was used to assess exposure to WB. For a wide range of social situations participants indicated the frequency with which they experienced stigmatization (0 = *never* to 9 = *daily*) because of their weight over their life span (e.g., negative comments from children, being stared at, being avoided, being excluded, being ignored because of one's weight). A global mean score over all 50 items was computed. Excellent reliability (Cronbach's $\alpha = 0.95$) was obtained for the German version that was based on a translation and back-translation procedure (Hilbert, unpublished manuscript).

2.2.5. Brief symptom inventory

(BSI; German version: Franke, 2000). T-standardized mean scores of the Global Severity Index (GSI) calculated from the 53 items of the BSI (0 = *not at all* to 4 = *extremely*) indicated general psychopathological impairments during the last week on nine dimensions (somatisation, obsession-compulsion, interpersonal sensitivity, depression, anxiety, hostility, phobic anxiety, paranoid ideation, psychoticism). The BSI demonstrated excellent reliability (Cronbach's $\alpha = 0.96$).

2.2.6. Implicit association test (IAT)

As a measure of implicit SE and implicit WB, the IAT (Greenwald et al., 1998) was administered using Inquisit Millisecond Software (Draine, 2004). The IAT as a computerized measure assessed the relative strength of associations between one pair of opposing attribute categories and one pair of opposing target categories. The IAT established good reliability ($0.80 < \text{Cronbach's } \alpha < 0.85$), convergent, discriminant, and predictive validity (Rudolph et al., 2010; Rudolph, Schröder-Abé, Schütz, Gregg, & Sedikides, 2008).

In the *Self-Esteem IAT (SE-IAT)* participants were instructed to categorize attribute stimuli as *positive* or *negative* and target stimuli into a *self* or *other* category (Greenwald & Farnham, 2000; stimuli developed by AH). Attribute stimuli contained four positive (e.g., loved, smart) and negative adjectives (e.g., awful, stupid). Target stimuli included four self-related (e.g., me, myself) and other-related stimuli (e.g., they, their). An idiographic variant of the SE-IAT was used with the participant's first name presented as one self-related stimulus. Similarly, in the *Weight Bias IAT (WB-IAT)*

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