

## Development of the Weight- and Body-Related Shame and Guilt Scale (WEB–SG) in a Nonclinical Sample of Obese Individuals

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In this article, we present the evaluation of the psychometric properties of a new self-report measure of Weight- and Body-Related Shame and Guilt (WEB–SG). The main purpose of the study was to measure shame and guilt feelings separately in obese individuals and investigate differing behavioral and emotional correlates of these emotions. Altogether, 331 obese participants completed the WEB–SG and other established self-report measures. A subset of the participants completed a 6-month follow-up. The WEB–SG proved to be internally consistent and temporally stable over a 6-month period. Regarding the factorial structure, a two-factor conceptualization was supported. The construct validity of the WEB–SG subscales was evidenced by a substantial overlap of common variance with related measures. The subscales Shame and Guilt showed differential correlation patterns to other scales. The WEB–SG is a brief, psychometrically sound measure for assessing body shame and guilt concerning weight control in obese individuals.

Our main goal of this study was to present a new measure of Weight- and Body-Related Shame and Guilt (WEB–SG) in obesity. Although obesity is not classified as a mental disorder, its negative effects on psychological well-being can be tremendous (Karlsson, Taft, Sjöström, Torgerson, & Sullivan, 2003; Sarlio-Lähteenkorva, 2001). This may lead to increased rates of mental disorders in the obese population (Becker, Margraf, Törke, Soeder, & Neumer, 2001). In addition, the obese population is a heterogeneous group with regard to psychological well-being. Thus, despite higher rates of psychopathology, we still lack sound knowledge about the psychological mechanisms involved in dealing with obe-

sity. Feelings of bodily shame and guilt about weight control attempts might mediate the link between obesity and psychopathology. We developed the WEB–SG in response to a perceived need for a short, easy-to-administer, self-report measure assessing the frequency of shame and guilt feelings related to obesity separately. A prevalence rate of approximately 20% in industrial countries (Lobstein & Frelut, 2003; Wyatt, 2003), a rising incidence (Flegal, Carroll, Kuczmarski, & Johnson, 1998), and the rather chronic character of obesity (Bray, 2004) underline the need to establish valid measures targeting factors crucial for psychological well-being in obesity.

## WHY ARE GUILT AND SHAME FEELINGS COMMON IN THE OBESE POPULATION?

There are several reasons why feelings of bodily shame and guilt concerning weight control are common among obese individuals. First, obese individuals are still overtly or implicitly discriminated against (Puhl & Brownell, 2003). Western society is strongly influenced by a dietary spirit that implies that losing weight can be easily achieved, for example, in magazines or advertisements, which may increase the social pressure on obese individuals. More important, obese individuals who receive negative feedback from others tend to attribute the feedback to their weight rather than to illegitimate prejudices of others (Crocker, Cornwell, & Major, 1993). This in turn might lead to feelings of inadequacy and retreat (Myers & Rosen, 1999). Second, failures of weight control attempts are mostly attributed internally by obese individuals (e.g., lack of willpower) rather than externally (e.g., specific aspects about diet), providing additional reasons for feelings of guilt and shame (Goodrick, Raynaud, Pace, & Foreyt, 1992; Jeffery, French, & Schmid, 1990). Third, expectations of obese individuals concerning treatment outcomes are rather high, with goal weights of 30% under their current weight (Foster, Wadden, Vogt, & Brewer, 1997). The latter reason is contrasted by longitudinal studies that have indicated poor weight loss maintenance after dietary treatments and a small chance of long-term reduction of 5% to 10% of the initial weight (Anderson, Konz, Frederich, & Wood, 2001; Jeffery et al., 2000; Sarlio-Lähteenkorva, Rissanen, & Kaprio, 2000). Consequently, the discrepancy between weight loss expectations (e.g., 30% under initial weight) and long-term treatment outcomes heightens the likelihood of perceiving successful weight control attempts (5% to 10% under initial weight) as failures, which are mostly then attributed internally. Finally, feelings of ineffectiveness after perceived failure in weight control attempts might have a negative effect on future weight maintenance and/or relapse (Byrne, 2002), which in turn may increase feelings of guilt or shame about the inability to control weight.

### WHY MEASURE GUILT AND SHAME FEELINGS IN OBESITY?

Shame and guilt feelings might have a prognostic relevance to the outcome of future weight loss trials. Burk-Braxton (1996) reported lowered weight-related self-efficacy scores in overweight nonmaintainers compared to overweight maintainers and controls. In the same study (Burk-Braxton, 1996), nonmaintainers were found to have the highest scores on measures of shame and guilt related to eating. Furthermore, shame and guilt feelings might increase the risk of developing a clinically relevant Axis I disorder. For example, it is well known in eating disorder research that weight-related shame and guilt are strongly related to the severity of the symp-

tomatology (Burney & Irwin, 2000; Frank, 1991; Sanftner, Barlow, Marschall, & Tangney, 1995).

### WHY A NEW MEASURE?

To our knowledge, there are three published scales tapping the constructs of weight-related shame and/or guilt. The shortest of these is a four-item scale called the Shame and Guilt Eating Scale (SG) by Frank (1990). Two items ask individuals to rate the level of guilt experienced when eating normally and overeating; the other two items assess individuals' experience of shame feelings. Even though SG is a short and valid instrument, it assesses guilt and shame feelings only as they relate to eating and overeating, respectively, therefore neglecting, for example, bodily shame or guilt regarding not exercising. For this reason, the scale was insufficient for our purpose. Another scale is the Body Image Guilt and Shame Scale (BIGSS; Thompson, Dinnel, & Dill, 2003). This is a scale assessing proneness to shame and guilt in weight- and body-related scenarios that requires the respondent to make four ratings in response to each of 15 scenarios, thus altogether requiring 60 ratings. Despite good psychometric properties, BIGSS has certain shortcomings in relation to our purpose. First, the task of 60 ratings is neither an easy nor a quickly accomplished one. Second, BIGSS measures the proneness of experiencing feelings of guilt and shame rather than the perceived frequency of their actual occurrence. Because we aimed to assess frequency of occurrence, we needed a scale with more general items rather than specific scenarios to make sure that obese individuals potentially experience the item content in real life. For example, if the rating for the shame item in the second scenario of BIGSS (scenario: "Your partner expresses disappointment over your body"; shame item: "You would feel diminished in your image of yourself") would be answered with "never," then the frequency rating could be interpreted in two ways: first, the absence of shame feelings in this scenario, or second, the absence of a partner. The third measure is the Objectified Body Consciousness Scale developed by McKinley and Hyde (1996). It comprises three subscales, each consisting of eight items measuring surveillance, body shame, and appearance control. Because our aim was to assess guilt and shame aspects separately, the scale did not meet our criteria.

### THEORETICAL CONSIDERATIONS

Guilt and shame are closely related through the common basis of a perceived failure in regard to a specific standard or rule. However, the current conceptualizations of these self-conscious emotions have distinct characteristics and consequences (Lewis, 1993). *Shame* refers to a failure or shortcoming attributed to the global self as the object of

evaluation. It is described as a highly negative emotional state accompanied by feelings of being exposed, worthless, or weak and manifests itself in the tendency to hide, disappear, or withdraw. Concerning *guilt*, the focus of the evaluation is on a specific behavior that led to a failure or shortcoming rather than on the individual itself. Remorse about the shown behavior is likely (but not inevitable) to elicit some corrective action to make up for the failure or shortcoming. In other words, shame applies to how one feels about oneself as a person and guilt applies to how one behaves. There is empirical evidence for the theoretical differentiation between shame and guilt. For example, self-discrepancies, measured by differences in adjective ratings about ideal, ought, and actual self, were found to be related to shame proneness rather than guilt proneness (Tangney, Niedenthal, Covert, & Barlow, 1998). Moreover, individuals in the study of Tangney, Miller, Flicker, and Barlow (1996) rated shame experiences to be more intense and aversive than guilt. Measures of general shame have been found to be related consistently to indexes of psychopathology (Andrews, Qian, & Valentine, 2002; Gee & Troop, 2003; Sanftner et al., 1995), whereas the empirical findings concerning general guilt are not as clear. Tangney, Wagner, and Gramzow (1992) reported mostly nonsignificant correlations between psychopathological symptom reports and guilt residuals (the unique variance in guilt) of a scenario-based guilt measure, whereas Harder, Cutler, and Rockart (1992) stated that their adjective-checklist guilt measure was significantly associated with the Symptom Checklist-90-Revised (Derogatis, 1994) global severity index ( $r = .45$ ). To explain the contrary results, Ferguson and Crowley (1997) confirmed by means of a multimethod approach two distinct kinds of guilt—ruminative and nonruminative. Ferguson and Crowley suggested that ruminative guilt may occur if the behavioral transgression is left unresolved. Individuals are then likely to experience ongoing distress in the form of self-accusation.

Despite distinctive features, we note that both emotions are likely to co-occur, and overall reports of guilt and shame experiences in the same situations are rather high. For example, one can avoid exerting oneself physically in front of others because of bodily shame and feel guilty about not working out at the same time.

Our main purpose in this study was to assess shame and guilt feelings separately in obese individuals and to investigate differing behavioral and emotional correlates of these emotions. Based on the preceding considerations, we defined the two constructs underlying the scale as the following: (a) shame concerning the body, figure, or weight in front of others or imagined others and (b) guilt concerning eating habits, exercising, and weight control. We chose a frequency rather than an intensity rating, as there is strong evidence that the frequency of affect has a stronger impact on a participant's well-being than intensity (Diener, Sandvik, & Pavot, 1991). To avoid the influence of fluctuant behavioral changes (short-term diets or exercise) on the measurement of the frequency

of guilt rather than shame feelings, we opted for a 6-month period in the scale instructions.

In addition to the WEB-SG, we chose several collateral measures. To test convergent validity, we included two short scales measuring guilt and shame feelings (SG, SG-Distress). To examine discriminant validity of the WEB-SG subscales, we included measures for depressive symptoms, self-esteem, body self-acceptance, and dietary restraint. Depressive symptoms, lowered self-esteem, and lowered body self-acceptance might be linked to shame because the current definition of shame includes the tendency to hide or disappear or feeling worthless. Restraint eating might be described as a consequence of guilt because it reflects a corrective action concerning weight. We included a measure of ruminative thoughts about being overweight to indicate the degree to which the Guilt subscale of the WEB-SG refers to ruminative or nonruminative guilt. *Ruminative guilt* reflects perseveration about repeated but not successful attempts at reparation, repetitive thoughts about transgressions, and feelings that no atonement for the misdeed would ever be sufficient. *Nonruminative guilt* refers to reparation or atonement, which implies a possible behavioral correction of the transgression (e.g., dieting).

## METHOD

### Item Generation and Reduction

Four experienced clinical professionals (including the author and the first three co-authors) created altogether 20 items possible for inclusion in the WEB-SG, 10 items referring to each—guilt or shame. We distributed this initial item pool to 15 experienced psychologists with the instruction to rate each item on a 5-point scale ranging from 1 (*not at all*) to 5 (*completely*) concerning its appropriateness to measure the assumed construct. That is, shame items were rated concerning their appropriateness to measure the shame construct, guilt items concerning their appropriateness to measure the guilt construct. Item selection was based on the criteria of a mean expert rating above 4. Finally, a scale of 12 items was determined with 6 items assessing body shame and another 6 items assessing guilt concerning weight control. We intended both subscales to be equal in length. In the instructions, we asked participants to rate how often they experienced feelings of guilt and/or shame in the last 6 months on a 5-point scale (0 = *never*, 1 = *rarely*, 2 = *sometimes*, 3 = *often*, and 4 = *always*).

### Procedure

Because the World Health Organisation (WHO) has defined obesity as a body mass index (BMI)  $\geq 30$  kg/m<sup>2</sup> (WHO, 1997), we recruited individuals with a minimum BMI of 30 through press releases, posters, and collaboration with general practitioners to take part in a study evaluating a new

counseling approach regarding genetic factors in obesity. We obtained written informed consent from each participant. Height and weight were assessed by medical staff either in general practice or at our laboratory. All participants provided demographic information and received 10 Euros incentive for their initial participation. We randomly contacted half of the individuals to participate in further studies (study sample). Exclusion criteria consisted of the inability to speak and read German; age of under 18 or above 70 years; and evidence of major sensory, cognitive, or communication deficits. The baseline survey comprised a questionnaire package, a psychiatric diagnostic interview, and an interview tapping relevant information about obesity. For a randomly chosen subsample of participants ( $n = 112$ ), we administered the same measures again after a 6-month period without any intervention during that time. We used the latter sample to determine retest reliability.

### Participants

Of the randomly contacted individuals, a total of 331 agreed to participate in further studies, which yields a dropout rate of 18.7%. Two thirds of the participants were women (68.9%). The mean age of participants was 45.50 years ( $SD = 13.28$ ; range = 18–70). The mean BMI was 36 ( $SD = 5.18$ ; range = 30–63). Table 1 provides an overview of demographic data of all respondents who took part in the study. Educational level has been conceptualized according to the standards of the Health Report for Germany (Statistisches Bundesamt, 1998), which combine school education indicators and occupational training indicators. In this report, school qualification was divided, along the lines of the German school system, into three categories (*low* = 9 years of schooling; *medium* = 10 years of schooling; *high* = 13 years of schooling). When compared to the distribution of the German population (Statistisches Bundesamt, 2005), the distribution of the level of education for our sample did not suggest any selection bias. Follow-up data for the retest-reliability estimation (no intervention sample) was available from 98 participants (attrition rate = 12.5%).

**TABLE 1**  
**Demographics of the Respondents**

Demographic	Overall <i>M</i> ( <i>n</i> = 331)
Female (%)	68.9
<i>M</i> age (SD)	45.50 (13.28)
<i>M</i> BMI (SD)	36.07 (5.18)
Living with partner (%)	71.1
Educational level (%)	
Low	38.9
Medium	34.1
High	27.0

Note. BMI = body mass index.

### Measures

In addition to the WEB–SG scale, we administered the following measures:

**Distress about shame and guilt feelings (Distress–SG).** As part of a short structured interview, we assessed Distress–SG by three items asking participants whether they experienced feelings of guilt or shame concerning eating, their body/figure, or exercise/physical strain (e.g. “Do you know feelings of guilt or shame concerning eating?”). If answering *Yes*, we asked participants to rate on a 4-point scale ranging from 1 (*never*) to 4 (*always*) how often these feelings were very distressing for them. We calculated a total score for each participant by summing up the distress ratings of positively answered questions.

**Shame and guilt concerning eating.** As described previously, the SG by Frank (1990) comprises four items that assess guilt and shame concerning normal eating and overeating (e.g., “When I overeat, I feel that I am doing something wrong”; scale ranging from 1 (*never*) to 5 (*always*)). Even though the guilt and shame subscales were moderately to strongly correlated in our sample (Spearman-Rho,  $r = .56$ ;  $p < .001$ ), we used subscale scores as well as sum scores of the SG.

**Body self-acceptance.** We administered the subscale Body Self-Acceptance. This forms part of the Frankfurt Body Image Scale (Deusinger, 1998) and measures attitudes toward aesthetical aspects of the body. The subscale comprises six items (e.g., “I am pleased with my appearance”) that were administered with a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*). It discriminated well between obese and normal individuals (Deusinger, 1998).

**Depressive symptoms.** The Center for Epidemiological Studies–Depression Scale short form (CES–D short form; Radloff, 1977) is a widely used, well-validated measure of depression appropriate for both clinical and nonclinical populations. The scale consists of 15 items, each rated on a 4-point scale ranging from 0 (*rarely*) to 3 (*most of the time*). Hautzinger and Bailer (1993) reported good reliability and validity for the German version. Concerning the detection of individuals with clinically relevant depression scores, the CES–D short form showed high correspondence (97%) compared to the CES–D long form.

**Self-esteem.** We measured self-esteem using the German adaptation of the Rosenberg Self Esteem Scale (Ferring & Filipp, 1996). The German scale was tested by Ferring and Filipp (1996) in three different samples that yielded satisfactory reliability and validity indexes. Stability was high, which underscores the trait character of the construct in measure. In

this study, we administered the 10 items with a 4-point scale ranging from 0 (*strongly disagree*) to 3 (*strongly agree*).

**Dietary restraint.** To measure the degree of our participants' dietary restraint, we used the Restraint scale of the Dutch Eating Behavior Questionnaire (DEBQ-R; Van Strien, Frijters, Bergers, & Defares, 1986). The scale comprises ten items describing intentions to restrict food intake for weight reasons. Its psychometric properties are discussed elsewhere (Van Strien et al., 1986). In a study conducted by Laessle, Tuschl, Kotthaus, and Pirke (1989), the scale proved to measure the actual restriction of food intake rather than the drive to be thin. In this study, items operated with a 5-point scale ranging from 1 (*never*) through 3 (*sometimes*) to 5 (*always*).

**Rumination about being overweight.** To identify whether our guilt subscale measures adaptive or maladaptive guilt feelings, we assessed rumination about being overweight with a short 4-item scale developed for this study ("I can't think of anything else than being overweight"; "Worries about my weight block my thoughts"; "The thoughts about being overweight do not leave my mind"; "I often brood about my weight"). The targeted construct is best described as the distressing preoccupation with one's weight. We administered the scale with a 6-point scale ranging from 1 (*strongly disagree*) to 6 (*strongly agree*).

### Statistical Analyses

Means, standard deviations, and corrected item-total correlations were computed using ITAMIS-PC (Diehl & Staufenbiel, 2002), which is a small but powerful program designed for psychometric analysis. We computed Cronbach's (1951) alphas and mean item-item correlation to test the internal consistency of the scale and its subscales. To study the factor structure of the WEB-SG, we used exploratory factor analysis (EFA) as well as confirmatory factor analysis (CFA). For that purpose, we divided the total sample randomly into two subsamples ( $n_1 = 166$ ;  $n_2 = 165$ ). First, we employed MINimum RESiduals (MINRES) EFA ( $n_1 = 166$ ). MINRES is based on the direct minimization of least squares and is known to be robust concerning any distributional assumptions (Jöreskog, 2003). In addition to the oblique rotation (promax), we included the orthogonal rotation (varimax) for an easier interpretation of the factorial structure. Second, we conducted maximum likelihood CFA using LISREL Version 8.54 (Jöreskog & Sörbom, 2003;  $n_2 = 165$ ). The tested models included (a) a two-factor model with correlated factors and (b) a single-factor model with all items loading on one factor. We employed the correlation matrix. Beside the minimum fit function chi-square value, we employed the root mean square error of approximation (RMSEA; Steiger, 1990), the standardized root mean square residual (SRMR; Jöreskog & Sörbom, 1981), and the comparative fit index (CFI; Bentler, 1990). The SRMR is defined as the

square root of the mean of the squared standardized residuals and describes the average discrepancy between the observed and the expected correlations across all parameter estimates, whereas the RMSEA is a population-based index estimating the lack of fit of the model to the population covariance matrix (Schermelleh-Engel, Moosbrugger, & Müller, 2003). An RMSEA of .08 should not be exceeded (Jöreskog, 1993). For the RMSEA, we reported 90% confidence intervals (CI90). Concerning the SRMR, a value not greater than .10 is considered to indicate good fit. Concerning model comparison, the CFI is often used in small samples because it avoids underestimation of good fit. Values range between 0 and 1. A value above .96 is indicative of good fit (Schermelleh-Engel et al., 2003). To compare the factor structure of women and men, we calculated the coefficient of congruency (FC; Gebhardt, 1967) and an inferential test statistic  $w$  (Shakun, Maguire, & Hakistan, 1976). An FC value above .95 is considered to indicate high congruency of factor structures. A test statistic  $w$  smaller than a critical value ( $w_{p<.05} = .254$ ) indicates no significant differences in factor structures.

To estimate the incremental validity of our measure, we calculated hierarchical regression analyses. We did not report standardized betas, as multicollinearity was high in the variable sets. We analyzed data using the SPSS (Version 11.0.1).

## RESULTS

### Factor Structure

EFA (MINRES) revealed two factors accounting for 32.3% and 27.5% of the variance in the WEB-SG responses, respectively (Table 2). A clear pattern of two subscales was visible in the item loadings of the orthogonal rotation (varimax). Item numbers 2, 4, 6, 7, 10, and 12 showed high loadings on the first factor (Shame subscale), whereas item numbers 1, 3, 5, 8, 9, and 11 showed high loadings on the second factor (Guilt subscale). On a theoretical basis, we expected the two subscales to be moderately correlated. For that reason, we conducted an additional oblique rotation (promax) to assess the degree of factor intercorrelation. This was calculated to be .64.

Maximum likelihood CFA confirmed the two-factor solution. Concerning the two-factor model, we allowed each set of six WEB-SG items (first set: 2, 4, 6, 7, 10, 12; second set: 1, 3, 5, 8, 9, 11) to load freely on a single factor. We freely estimated the correlation between the two latent factors ( $\Phi = .70$ ). Minimum fit function chi-square for the two-factor model was 142.87 ( $df = 53$ ),  $p < .001$ ; RMSEA (CI90) = .08 to .12; SRMS = .05; CFI = .97. Because all items showed rather high loadings (.33-.91) on the first factor in the unrotated factor solution of the EFA, we also tested a single-factor model. Minimum fit function chi-square for the single-factor model was 310.77 ( $df = 54$ ),  $p < .001$ ; RMSEA (CI90) = .17 to .21; SRMS = .10;

**TABLE 2**  
**Factor Loadings for EFA and CFA of the**  
**WEB-SG Items**

Item	MINRES EFA <sup>a</sup>				Com	ML CFA <sup>b</sup>	
	Varimax		Promax			Factor 1	Factor 2
	Factor 1	Factor 2	Factor 1	Factor 2			
2	.82	.26	.95	-.07	.74	.94	—
4	.84	.30	.90	.02	.79	.93	—
6	.88	.25	.90	-.01	.83	.91	—
7	.67	.32	.59	.18	.56	.80	—
10	.61	.34	.45	.28	.49	.70	—
12	.60	.40	.40	.37	.52	.74	—
1	.40	.78	.05	.85	.76	—	.75
3	.36	.76	-.01	.86	.71	—	.74
5	.25	.60	-.02	.66	.42	—	.64
8	.16	.57	-.07	.62	.36	—	.68
9	.24	.78	-.06	.81	.66	—	.82
11	.36	.48	.25	.40	.36	—	.70
Eigenvalues	3.88	3.3					
% explained variance	32.3	27.5			59.8		

Note. EFA = exploratory factor analysis; CFAS = confirmatory factor analysis; WEB-SG = Weight- and Body-Related Shame and Guilt Scale; MINRES EFA = minimum residual EFA; ML CFA = maximum likelihood CFA; Com = Communalities of the MINRES EFA. Item numbers indicate the presented order.

CFI = .91. The decrement in fit associated with the one-factor model was significant,  $\chi^2(N = 165) = 310.77-142.87 = 167.9, p < .05$ . Table 2 gives an overview of the factor analytic results.

**Psychometric Properties of the Items and Subscales**

Table 3 shows item means, standard deviations, and corrected item-total correlations computed in relation to their six-item subscale. All item means ranged between 1.2 and 2.7, with standard deviations close to 1 (item scoring: 0 = never, 1 = rarely, 2 = sometimes, 3 = often, 4 = always). All item-total correlations reached values above .50. Subscale means were satisfactorily close to the midpoint 12 of the scale ( $M_{Shame} = 10.69, SD = 6.66; M_{Guilt} = 13.84, SD = 5.15$ ). The mean item-item correlation for the Shame subscale (.69) was higher compared to the Guilt subscale (.52). Alpha coefficients (Cronbach’s alpha) were excellent for both subscales ( $\alpha_{Shame} = .92; \alpha_{Guilt} = .87$ ). Kolmogorov-Smirnov tests of the distributions of scores indicated that the Guilt subscale scores were normally distributed (skew = -.09; kurtosis = -.36), but this was not the case for the Shame subscale scores (skew = .26; kurtosis = -.90). Spearman intercorrelation of the subscale scores ( $r_{Shame \times Guilt}$ ) was .64, which indicated related but not redundant subscales.

**Test-Retest Reliability**

We examined the temporal stability of the WEB-SG by calculating intraclass correlation (ICC) indexes (two-way, mixed). Of the consecutively assessed participants, 98 completed the follow-up survey 6 months after the baseline survey (no intervention) with an attrition rate of 12.5%. The ICC of the Shame and Guilt subscales reached .79 and .72, respectively. We also checked for differences in subscale scores between Time 1 (T1) and Time 2 (T2) by means of *t* tests, which showed no significant differences:  $M_{Shame,T1} = 11.38; M_{Shame,T2} = 10.58; t_{Shame(97)} = -1.27, p > .20, d = .13; M_{Guilt,T1} = 14.39; M_{Guilt,T2} = 13.49; t_{Guilt(97)} = -1.65, p > .10, d = .17$ .

**WEB-SG, BMI, and Demographic Variables**

Significantly higher means for women were evidenced for both the Guilt subscale ( $M_{women} = 14.71; M_{men} = 11.83$ );  $t(329) = 4.87, p < .001, d = .58$  and the Shame subscale ( $M_{women} = 12.43; M_{men} = 6.85$ );  $t(329) = 7.93, p < .001; d = .94$ . For the *t* test performed with the shame subscale, equal variances were not assumed based on Levene’s test (Brown & Forsythe, 1974) for equality of variances. We found high internal consistency estimates on the Shame and Guilt subscale for both women ( $\alpha_{Shame} = .91; \alpha_{Guilt} = .86$ ) and men ( $\alpha_{Shame} = .92; \alpha_{Guilt} = .86$ ). An EFA we performed separately for women and men indicated similar factor structures, with the factors accounting for 64.4% and 66.7% of the variance, respectively. The FC value reached .98, and the factor structures did not differ significantly ( $w = .11$ ).

Product-moment correlation between participants’ age and the shame subscale scores was significant, although effect size was small ( $r = -.18, p < .01$ ), whereas the product-moment correlation between age and the guilt subscale scores was not significant ( $r = -.08, p > .15$ ). Visual examination of the scatter plot did not suggest any nonlinear relationship between these variables. There was a small but significant correlation between the participants’ BMI and shame ( $r = .21; p < .01$ ) but not with guilt ( $r = .10, p > .05$ ). With regard to educational level, analyses of variance did not yield any significant group mean differences on either subscale: WEB-Shame,  $F(2, 328) = 1.27, p > .20, \eta^2 = .009$ ; WEB-Guilt,  $F(2, 328) = 1.03, p > .30, \eta^2 = .007$ .

**Incremental Validity**

We separately conducted a series of linear regression analyses to predict collateral measure scores from guilt- and shame-related scales (Table 4). We used hierarchical regression procedures entering the SG-Shame or SG-Guilt subscale first and in a second step, the WEB-Shame or WEB-Guilt subscale. We did not include Distress-SG, as the scale did not assess guilt and shame feelings separately. Entering WEB-Shame in the second step, we observed significant changes

**TABLE 3**  
Means, Standard Deviations, and Corrected Item-Total Correlations of the WEB-SG

Item	<i>M</i>	<i>SD</i>	<i>r<sub>it-c</sub></i>
Shame subscale			
2. When I am in a situation where others can see my body (e.g., pool, changing room), I feel ashamed.	2.21	1.29	.83
4. The appearance of my body is embarrassing for me in front of others.	2.05	1.26	.85
6. When I think of the possibility that others can see my naked body, I would rather hide somewhere.	1.92	1.39	.86
7. I am ashamed of myself when others get to know how much I really weigh.	2.10	1.42	.75
10. I avoid exerting myself physically in front of others since I feel embarrassed.	1.21	1.14	.70
12. Since the size of my clothes is embarrassing for me, I would rather avoid shopping for new clothes.	1.21	1.29	.72
Guilt subscale			
1. When I have eaten more than I want, I experience feelings of guilt.	2.14	1.22	.73
3. When I eat fattening food (e.g., tarts), I get distressed by the feeling that I did something wrong.	1.92	1.19	.73
5. When I can't manage to work out physically, I feel guilty.	1.98	1.11	.60
8. When I can't get a grip on my weight, I blame myself.	2.66	1.03	.57
9. I blame myself when I break a good resolution concerning my eating.	2.43	1.09	.75
11. When I watch myself in the mirror, I feel guilty and decide to do more for my figure.	2.69	1.01	.59

Note. WEB-SG = Weight- and Body-Related Shame and Guilt Scale; *r<sub>it-c</sub>* = corrected item-total correlation computed in relation to its six item subscale. *N* = 331. Item numbers indicate presented order. Original version was presented in German language. Item scoring: 0 = *never*, 1 = *rarely*, 2 = *sometimes*, #3 = *often*, 4 = *always*. The German version may be obtained from M. Conradt.

**TABLE 4**  
 $R^2$  Change in Hierarchical Regression Analyses Predicting Collateral Measure Scores

Analysis	Body Self-Acceptance	Depressive Symptoms	Self-Esteem	Dietary Restraint	Rumination
SG-shame	.21**	.15**	.23**	.00	.42**
WEB-shame	.19**	.09**	.06**	.00	.09**
Total variance	.40	.24	.29	.00	.51
SG-guilt	.16**	.07**	.12**	.06**	.27**
WEB-guilt	.13**	.07**	.03*	.00	.12**
Total variance	.29	.14	.15	.06	.39

Note. *N* = 327. SG-Shame and SG-Guilt = Shame and Guilt Eating subscales; WEB-Shame and WEB-Guilt = Weight- and Body-Related Shame and Guilt subscales.

\*  $p < .01$ . \*\*  $p < .001$ .

in  $R^2$  for most regressions such as body self-acceptance (+.19), depressive symptoms (+.09), self-esteem (+.06), and rumination (+.09). The only exception was dietary restraint, of which zero variance could be explained by both shame subscales. We observed a similar pattern when considering WEB-Guilt, although the total amount of variance as well as the changes in  $R^2$  were smaller for body self-acceptance (+.13), depressive symptoms (+.07), and self-esteem (+.03). For rumination, the change in  $R^2$  reached .12 by entering WEB-Guilt, but the total amount of explained variance did not exceed the level reached by the Shame subscales. Again, restraint eating was the exception, as no further variance could be explained by entering WEB-Guilt.

#### Discriminant Validity of the WEB-SG Subscales

To examine separate and independent associations, we present Pearson correlations between the WEB-Shame and WEB-Guilt subscale with collateral measures (Table 5). Substantial associations of both subscales with all collateral mea-

asures could be observed except for dietary restraint. The correlations with body self-acceptance and self-esteem were negative, as both measures tap the presence rather than the absence of the construct in measure. Overall, the differences in Pearson correlations between subscales were not remarkable. After conducting *t* tests for dependent correlations (two sided;  $\alpha = 5\%$ ), the differences between correlations for the Shame and Guilt subscales were significant for SG-Guilt (.42 < .63) and self-esteem (-.50 > -.35). To account for the common variance between the subscales, we calculated partial correlations in which WEB-Guilt was factored out of WEB-Shame and vice versa. In contrast to the Pearson correlations, a distinct pattern of associations was visible after factoring out WEB-Shame or WEB-Guilt, respectively. As expected, the WEB-Shame remained substantially associated to SG-Shame, Distress-SG, body self-acceptance, depressive symptoms, self-esteem, and ruminative thoughts about being overweight. After controlling for the variance of WEB-Shame, the WEB-Guilt subscale still showed substantial correlations with SG-Guilt and rumination about being overweight. The relations to SG-Shame, Distress-SG, and

**TABLE 5**  
**Pearson and Partial Correlations for the**  
**WEB-SG Subscales to Indexes of**  
**Psychopathology**

Subscale	Pearson		Partial correlations: Residuals	
	Shame	Guilt	Shame	Guilt
SG-Shame	.64*	.55*	.44*	.24*
SG-Guilt	.42* <sup>a</sup>	.63*	.02	.52*
Distress-SG	.69*	.59*	.51*	.25*
Body Self-Acceptance	-.63*	-.54*	-.45*	-.22*
Depressive Symptoms	.48*	.37*	.35*	.08
Self-Esteem	-.50* <sup>a</sup>	-.35*	-.40*	-.04
Dietary Restraint	.07	.15	-.04	.14
Rumination	.65*	.60*	.43*	.30*

Note. *N* varied from 327 to 331. WEB-SG = Weight- and Body-Related Shame and Guilt Scale; SG = Shame and Guilt Eating Scale; SG-shame = SG Shame subscale; SG-Guilt = SG Guilt subscale, Distress-SG = Distress about shame and guilt feelings measured by the interview.

<sup>a</sup>*t* tests for dependent correlations indicate significant differences between the correlations for the Shame and Guilt subscale; *p* < .05 two-sided.

*p* < .001.

body self-acceptance remained significant but did not exceed a coefficient of .25. Again, it was surprising that dietary restraint showed no significant association to either of the subscales. In particular, we had expected WEB-Guilt to be associated with the behavioral tendency to restrain one's diet.

## DISCUSSION

In this article, we describe the development and validation of a 12-item measure for body shame and guilt concerning weight control. We developed it in response to a perceived need for a short, easy-to-administer, self-report measure assessing the frequency of shame and guilt feelings as they separately relate to obesity. The results of the study indicate that the WEB-SG was a psychometrically sound, reliable, and valid instrument for measuring the frequency of feelings of body shame and guilt concerning weight control in a sample of obese individuals. The subscales were found to have excellent internal consistencies, corrected item-total correlations, and well-distributed item means. The results of the factor analyses of the responses confirmed the two-factor conceptualization of the scale and reproduced the theoretically derived item sets to measure body shame and guilt concerning weight control. The moderate intercorrelation of the Shame and Guilt subscale scores as measured by WEB-SG ( $r = .64$ ) were comparable to those of other studies that have used different measures such as SG ( $r = .75$ ; Burney & Irwin, 2000) or BIG-SS ( $r = .59$ ; Thompson et al., 2003). This points to the interpretation of a population-based value rather than a coefficient resulting from the sample or measure in use.

The 6-month test-retest reliability of both subscale responses calculated by employing ICC showed consistency over time. The consistency in responding was not surprising given that the instructional set for the WEB-SG focuses on a 6-month window. Therefore, the shame and guilt reactions to body weight measured by the WEB-SG may be interpreted as being consistent over time given that the person's situational contexts do not change. Kocherscheidt Fiedler, Kronmüller, Backenstraß, and Mundt (2002) came to the same conclusion with general shame and guilt. We expected body shame to be more stable across time than guilt feelings because theoretically, body shame is linked more strongly to self-esteem. In contrast, guilt focuses on behavioral, more variable shortcomings. Surprisingly, the ICC of both the shame (.76) and guilt (.72) responses were almost equally high.

Body shame and guilt concerning weight control were found to be only weakly associated to BMI, gender, or age in our study. Starting with the BMI, participants reported a varying frequency of guilt and shame feelings concerning their weight almost independently of the level of obesity. This is an important finding, as the emotional burden of obesity might be independent of the actual weight. However, we investigated on a limited range of BMI (> 30), and therefore, variance might be limited in our sample. Concerning gender, women reported slightly more frequent weight- and body-related feelings of shame and guilt. This result has also been found in other studies measuring general shame and guilt (Gross & Hansen, 2000; Lutwak & Ferrari, 1996). Women might experience higher levels of social pressure to be thin than men. Gross and Hansen (2000) explained the gender difference with the notion that women tend to value interpersonal relationships more than men as a result of their socialization and are therefore more prone to the interpersonal experience of shame. Moreover, men seem to estimate their implicit weight identity as lighter than their actual weight status (Grover, Keel, & Mitchel, 2002) and might feel less ashamed even if weight status is the same as compared to a female counterpart. In our sample, we found shame scores were inversely related to age ( $r = -.18$ ), which might be explained by the finding that elderly individuals tend to rate their general emotional well-being more positively than younger individuals (Clarke, Marshall, Ryff, & Rosenthal, 2000). Furthermore, younger individuals might experience more normative pressure concerning their body appearance compared to older individuals. We could not find any significant differences on subscale scores between different educational levels. Therefore, education does not seem to have any influence on the self-report in the case of the WEB-SG.

Incremental validity was evidenced by examining the relationship between the two subscales and collateral measures employing stepwise hierarchical regression analysis. First, results indicate that the WEB-SG subscales provided greater predictiveness over the existing SG subscales for most collateral measures, particularly for body self-acceptance,



depressive symptoms, and ruminative thoughts. This result most likely stems from the fact that our measure covers broader concepts of guilt and shame compared to the SG. Second, it is noteworthy that in our sample, the WEB-SG subscales failed to account for a significant amount of explained variance of dietary restraint. In particular, we had expected the WEB-Guilt subscale to be substantially associated with dietary restraint because theoretically, dietary restraint is supposed to be a guilt-inherent corrective action in obese individuals. The latter result could be interpreted in two ways: (a) that either the frequency of experienced body shame and guilt concerning weight control reported by obese individuals is independent of the reported calorie restriction or (b) that the WEB-SG subscales simply failed to tap the corrective action of restricting one's diet. In contrast to normal weight samples in which the relationship between guilt and shame about eating and eating disturbance could be evidenced (Burney & Irwin, 2000; Frank, 1991), the results of our study did not identify such an association in an obese sample. This was in spite of our measure including three items tapping guilt about eating. Regarding the first interpretation (a), some obese individuals might experience shame or guilt feelings about their body and their eating without necessarily reducing their calorie consumption. Instead, they may choose other coping strategies such as social withdrawal (Puhl & Brownell, 2003), constant self-criticism, or ruminative thoughts about the unresolved behavioral transgression. Third, the results of the Pearson and partial correlations were consistent with previous research that has suggested shame to be related to indexes of psychopathology (Gee & Troop, 2003; Sanftner et al., 1995; Tangney et al., 1992), and that has supported the self-destructive effects of shame feelings as proposed by Lewis (1993). Regarding the WEB-Guilt subscale, results clearly show that the subscale refers to potentially maladaptive aspects of guilt such as ruminative and intrusive thoughts about being overweight. Following the distinction of Ferguson and Crowley (1997), guilt as measured by the WEB-SG may partly be considered ruminative.

An advantage of the WEB-SG is that it provides a possible differentiation between behavioral and emotional consequences associated with weight- and body-related guilt and shame. Future studies addressing specific consequences of the two emotions are feasible. For example, shame and guilt feelings might have diverse predictive effects on weight loss and/or psychological well-being. Shame might be more predictive of mental health problems, whereas guilt might be linked to weight loss trials. Furthermore, the developmental sequence of obesity, body shame, and guilt concerning weight control warrants further empirical scrutiny. Body shame might be a cause of guilt feelings and reparative action, whereas being overweight itself might be a trigger for body shame in a subsample of obese individuals. The results of this study indicate that subgroups might exist with different developmental sequences concerning the discussed variables because only some participants felt shame about

their body. The identification of these subgroups would have practical implications for the therapy of obese individuals. That is, with regard to obesity, body shame could emerge as a more important consideration than weight-related guilt. Again, this issue needs further investigation.

Although the use of self-report measures is recommended for assessing emotional states, they only provide information about conscious and recalled experiences of past shame and guilt feelings. One may argue that a strength of the study was the employment of an interview in addition to the questionnaire. Even though we had a considerably diversified and large sample, we have to take self-selection into account. Participant acquisition may have been biased by monetary incentives or the willingness to take part in a study run by a psychological department. Additionally, we defined the BMI to be above 30; thus, variance may have been limited. Further replication and cross-validation of these findings in other samples, particularly in clinical samples, is needed. Furthermore, the results are only correlational in nature so that no conclusions regarding causality or the developmental sequence of shame and guilt in obese individuals can be drawn. Finally, we note that our study used the German version of the WEB-SG. The English translation may yield different psychometric properties due to cultural and language differences.

In conclusion, the WEB-SG is a brief, psychometrically sound measure for assessing body shame and guilt concerning weight control in obese individuals. It was a reliable measure, showed good convergent validity, and the guilt and shame subscales displayed discriminant correlational patterns to other scales. The scale could be useful for researchers or clinical practitioners to scrutinize diverse effects of body shame and guilt concerning weight control measured by the WEB-SG. Further research is needed regarding discriminative validity and the utility of the measure in clinical settings.

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