

Development and Validity of a Very Short Form of the Eating Disorder Inventory

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This is the final prepublication version of:  
Maïano, C., Morin A. J. S., Monthuy-Blanc, J., Garbarino, J.-M., & Ninot, G. (2016). Development and validity of a very short form of the Eating Disorders Inventory. *Comprehensive Psychiatry*, 65, 141-149. doi: j.comppsy.2015.11.004  
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Abstract

**Introduction:** The main objective of the present series of studies was to develop and validate a 16-item very short form of the Eating Disorder Inventory (EDI-VS) for use as a short assessment tool in large-scale comprehensive or longitudinal studies, as well as in-depth idiographic studies.

**Method:** The EDI-VS was developed, and validated, through a series of five studies based on independent community samples including a total of 1,372 French adolescents.

**Results:** The results supported the reliability, content validity, factor validity, convergent validity, and criterion-related validity of the EDI-VS.

**Conclusions:** The EDI-VS comprises 16 items assessing the eight original dimensions of the conceptual model for the EDI. Recommendations for future practice and research on the EDI-VS are outlined.

**Keywords:** Eating disorders; disturbed eating attitudes and behaviors; EDI; Very Short.

## 1. Introduction

Eating disorders (ED) are pervasive developmental disorders characterized by problematic self-images and eating attitudes and behaviors [1]. They are known to be associated with a wide array of severe negative consequences, with death as a possible outcome [2]. Prevalence rates of ED remain low ( $\leq 1\%$ ) among young females [3]. However, subclinical Disturbed Eating Attitudes and Behaviors (DEAB) are far more prevalent [4, 5] and represent significant predictors of clinical levels of ED [1].

Numerous self-report questionnaires have been developed to assess DEAB in the general population [6-10]. These instruments generally focus on DEAB related to specific types of ED [11-15] or on most of the core components of ED [16-20]. Most of these instruments have been validated or adapted for adolescents. However, their length (22 to 64 items) is a serious drawback for large-scale comprehensive studies and in-depth idiographic studies, where it may create an unnecessary burden and undermine compliance with, and participation in, the study. Unfortunately, very few short instruments are available to assess DEAB in the general population [10, 21]: The eight-item Eating Disorder Examination-Screening Version [22], the five-item Eating Disturbance Scale [23], the eight-item Risk Behavior for Eating Disorders [24], the five-item SCOFF [25], the six-item Short Evaluation of Eating Disorders [26], and the five-item screening version of the Eating Disorder Inventory (EDI; [21]). However, these screening instruments tend to focus on a limited number of ED/DEAB characteristics and to sacrifice precision through the reporting of a single global score, rather than providing comprehensive multidimensional assessments. These instruments also generally rely on Likert-type response scales, which tend to be associated with insufficient variability at the item-level to provide precise repeated assessments providing sufficient sensitivity to short-term fluctuations [27, 28].

Given the absence of short multidimensional measures of DEAB suitable for intensive idiographic studies, the development of such instruments has been identified as a research priority [29, 30]. The purpose this article was to develop and validate a very short form (2-item per scale) of the EDI [18], the EDI-VS, following guidelines for short-form development [31-35]. The EDI was retained for two reasons. First, most instruments are limited to a specific form of ED (AN, BN) and assess a restricted range of DEAB characteristics, whereas the EDI evaluates the full range of DEAB (Body Dissatisfaction, Bulimia, and Drive for Thinness), as well as personality characteristics associated with ED (Ineffectiveness, Perfectionism, Maturity Fears, Interpersonal Distrust, and Interoceptive Awareness). Second, the EDI is the most widely used [36, 37] and cross-validated [38-40] instrument for the assessment of DEAB. In this adaptation, Likert scales were replaced with visual analog scales (VASs; where respondents mark their answers on a continuous line [27, 28]) that: (a) have more discriminating capacity and variability than alternative formats; (b) do not impose artificial categories on responses; (c) are less vulnerable to memory effects and consistency biases; (d) are suitable for frequent and repeated use; and (e) have an established reliability and validity.

This series of five studies is based on five independent samples and met the ethical requirements for research with human participants in France. Appropriate consent procedures were followed to obtain participants' voluntary agreement prior to data collection. The *first study* aimed to develop a preliminary version of the EDI-VS using a VAS answer scale. The *second study* verified the first-order and higher-order factor structure of the EDI-VS, its reliability, and its invariance across genders [41] given that DEAB are known to take different forms and to emerge from different risk factors in boys and girls [42]. The *third study* verified the relations between the global and scale scores of the EDI-VS and those from the original EDI [31]. It was hypothesized that the EDI-VS scales would be more strongly related to corresponding EDI scales than to other EDI scales. The *fourth study* verified the convergent validity of the EDI-VS with another measure of DEAB (Eating Attitudes Test; EAT-26 [11, 43-44]), as well as with measures representing central components of ED [1, 46-48]: global self-esteem and social physique anxiety. Previous research revealed (a) positive correlations between scores on the EAT-26 and the global, drive for thinness, bulimia, body dissatisfaction, and interoceptive awareness scales of the EDI [18, 45]; (b) positive associations between scores on social physique anxiety and the drive for thinness, bulimia, and body dissatisfaction scales of DEAB instruments [49, 50]; and (c) negative relations between scores on global self-esteem and the body dissatisfaction, ineffectiveness, perfectionism and interpersonal distrust scales of DEAB measures [18, 51, 52]. The same pattern of correlations was expected here. The *fifth study* tested the criterion-related validity of the EDI-VS in participants with AN and without ED to see whether the EDI-VS could also be used for screening purposes. As already found in previous studies [36, 39, 40] it is expected that clinical participants with ED scored significantly

higher than community controls on all scales of the EDI.

## 2. Methods

### 2.1. Participants and Procedures

**Study 1.** A sample of 291 adolescents [ $M_{\text{age}} = 14.32$ ; mean body mass index (BMI; weight/height<sup>2</sup>) = 19.37,  $SD_{\text{BMI}} = 1.19$ ], including 156 boys and 135 girls, was recruited in three French secondary schools. All Participants completed French version of the EDI [38].

**Study 2.** A sample of 900 adolescents ( $M_{\text{age}} = 13.70$ ;  $M_{\text{BMI}} = 19.21$ ,  $SD_{\text{BMI}} = 2.59$ ), including 450 boys ( $M_{\text{age}} = 13.71$  years;  $M_{\text{BMI}} = 19.53$ ) and 450 girls ( $M_{\text{age}} = 13.70$  years;  $M_{\text{BMI}} = 18.88$ ), was recruited in four French secondary schools. All participants completed the EDI-VS developed in Study 1.

**Study 3.** A sample of 51 adolescents ( $M_{\text{age}} = 13.94$ ;  $M_{\text{BMI}} = 19.67$ ,  $SD_{\text{BMI}} = 2.84$ ), including 26 boys and 25 girls, was recruited in two French secondary schools. The participants completed the French versions of the EDI [38] and EDI-VS, in a randomly assigned order.

**Study 4.** A sample of 92 adolescents ( $M_{\text{age}} = 14.59$ ;  $M_{\text{BMI}} = 19.47$ ,  $SD_{\text{BMI}} = 0.85$ ), including 35 boys and 57 girls, was recruited in two French secondary schools. The participants completed the EDI-VS and the French version of the EAT-26 [53, 54], the Rosenberg Self-Esteem Inventory (RSEI; [55, 56]), and the Social Physique Anxiety Scale (SPAS; [48, 57]).

**Study 5.** A sample of 38 adolescent girls ( $M_{\text{age}} = 15.68$ ;  $M_{\text{BMI}} = 17.21$ ,  $SD_{\text{BMI}} = 2.02$ ), including 19 without ED and 19 suffering from anorexia nervosa was involved in this study and completed the EDI-VS. Anorexic patients were recruited in a psychiatric unit where 74% received inpatient treatment. Girls without ED were recruited in a French secondary school and were screened negative for history of ED with the fifth French version of the Mini International Neuropsychiatric Interview (MINI; [58]).

### 2.2. Measures

**EDI.** The 64-item French version of the EDI [38] assesses: (a) DEAB (Body Dissatisfaction; Bulimia; and Drive for Thinness); and (b) personality characteristics commonly related to ED (Ineffectiveness; Perfectionism; Interpersonal Distrust; Interoceptive Awareness; and Maturity Fears). Each item is rated on a six-point scale (always to never).

**EDI-VS.** The 16-item of the EDI-VS assesses the same scales than the French version of the EDI. Participants received the following instructions: “*The next 16 sentences express feelings you may currently have toward yourself. For each sentence, please indicate how you feel at the moment by tracing a perpendicular mark on each answering line.*” Each item is rated using a VAS comprising a 10-centimeter horizontal line defined by two extremes: “not at all” (0 cm = 0) and “absolutely” (10 cm = 10) on which respondents mark their answers with a perpendicular line.

**EAT-26.** The French version of the EAT-26 [54] was validated in English and French samples of adolescent and adult females from clinical (ED) and non-clinical subgroups ( $N = 1,196$ ). The results supported the original factor structure, the scale score reliability ( $\alpha = .86$ ), and the criterion-related validity [54]. The 26 items are rated on a six-point scale (always to never).

**RSEI.** The 10-item of the French version [56] of the RSEI was validated in a series of four studies ( $N = 539$ ). The results supported the a priori single-factor structure, scale score reliability ( $\alpha = .70$  to  $.90$ ), test-retest reliability ( $r = .84$ ), and convergent validity of the RSEI [56]. The items are rated on a four-point scale (strongly disagree to strongly agree).

**SPAS.** The French version [57] of the SPAS was validated in a series of six studies ( $N = 1563$ ). Findings supported the a priori single-factor across two independent samples and confirmed the scale score reliability ( $\alpha = .81$  to  $.87$ ), test-retest reliability ( $r = .78$ ) and convergent validity [57]. Each item is rated on a five-point scale (not at all to extremely).

**MINI.** The fifth French version of the MINI [58] is a short structured diagnostic interview that can be used to diagnose 16 axis I psychiatric disorders according to the fourth edition of the Diagnostic and Statistical Manual of Mental Disorders [59] and the tenth edition of the International Statistical Classification of Diseases and Related Health Problems [60]. Only the AN and BN modules were used.

### 2.3. Analyses

**Study 1.** Items from the preliminary version of the EDI-VS were selected using a preliminary confirmatory factor analyses (CFA) performed separately on each of the eight EDI factors [32]. Detailed results from these preliminary analyses are reported in the online supplements. These 16 items were then submitted to a final CFA with eight correlated factors. Relying on two indicators per factor creates locally under-identified latent constructs even though the overall model remains identified due to factor correlations. To address this issue, each latent factor was fully locally identified by placing equality

constraints on both loadings (i.e., essentially tau-equivalent constraints – ETEC [61, 62]). Analyses were performed using the Mplus 7.0 [63] robust maximum likelihood (MLR) estimator. Model fit was assessed with the [64, 65]: Chi-square ( $\chi^2$ ), comparative fit index (CFI > .90), Tucker-Lewis index (TLI > .90), and root mean square error of approximation (RMSEA < .08).

**Study 2.** First-order CFAs were first performed, one without ETEC, and one with ETEC. A second-order CFA was then used to verify whether the eight first-order factors could load on a single second-order factor representing ED. These analyses were performed with Mplus 7.0 [63], using the MLR estimator with full information estimation to account for the small amounts of missing data at the EDI-VS item level (0.10% to 6.20%;  $M_{\text{missing}} = 2.14\%$ ). The measurement invariance of the EDI-VS was then tested in a sequence devised through a combination of Meredith's [41] and Cheung's [66] recommendations for first- and higher-order models. The measurement invariance of the first-order-factor model was estimated first, without a second-order factor [66]: (a) configural invariance, (b) loading invariance without ETEC, (c) loading invariance with ETEC; (d) intercept invariance, (e) uniqueness invariance, (f) variance/covariance invariance, and (g) latent mean invariance. Third, the invariance of the second-order structure was verified in the following sequence: (a) baseline (specified based on steps a to d of the preceding sequence); (b) second-order loading invariance; (c) second-order intercept invariance; (d) second-order disturbance invariance; (e) second-order variance/covariance invariance; and (f) second-order latent mean invariance. The fit of the models was estimated in this study as in Study 1. Measurement invariance tests were evaluated by examining scaled  $\chi^2$  difference tests [63, 67],  $\Delta$ CFIs ( $\leq .010$ ), and  $\Delta$ RMSEAs ( $\leq .015$ ) [68, 69].

**Study 3.** Correlation analyses were used to test the convergent validity of the global and scale scores of the EDI-VS and of the EDI. To compare the size of the correlations,  $r$  coefficients were transformed into  $z$ -scores using Fisher's [70]  $r$ -to- $z$  formula [ $z_{jk} = \frac{1}{2} \ln (1+r_{jk}/1-r_{jk})$ ]. These  $z$ -scores were then compared using Steiger's [71] formula [ $Z = Z_{r_{(jk)}} - Z_{r_{(jh)}} / \sqrt{2 \cdot 2(\text{Cov}_{jk,jh})/n-3}$ ].  $Z$  values higher than 1.96 and 2.58 were significant at  $p < .05$  and  $p < .01$ , respectively.

**Study 4.** Correlation analyses were used to test the convergent validity of the global and scale-specific scores of the EDI-VS with the full scales of the EAT-26, the RSEI and the SPAS. A Bonferroni correction was applied to minimize Type I error rate inflation. The alpha error (.05) was divided by three, because of the three comparisons being made (EAT-26, RSEI, and SPAS), and set at .02 (after rounding). The size of the correlations was estimated in this study as in Study 3 [70, 71].

**Study 5.** For the criterion-related validity analyses, the difference between the clinical and non-clinical groups on scales and full scale scores were tested using nine independent-sample  $t$ -tests (one tailed). A Bonferroni correction was applied to minimize Type I error rate inflation. The alpha error (.05) was divided by nine (eight scales and the full scale score) and was thus set at .006.

### 3. Results

#### 3.1. Study 1: Development of the EDI-VS

An eight-factor CFA model was estimated based on the retained 16 items and resulted in acceptable fit to the data [ $\chi^2$  (76) = 115.32,  $p = .002$ ; CFI = .959; TLI = .935; RMSEA = .042]. The ETEC resulted in an improvement in model fit [ $\chi^2$  (84) = 98.73,  $p = .13$ ; CFI = .985; TLI = .978; RMSEA = .025], keeping in mind that increases in CFI are related to the MLR scaling correction factor. Parameter estimates from this model are reported in Table 1, and revealed satisfactory standardized loadings, as well as moderate factor correlations between most factors, suggesting the possibility of a higher-order ED factor. All scales presented modest to acceptable Cronbach's alpha: Drive for Thinness: .88; Bulimia: .70; Body Dissatisfaction: .76; Ineffectiveness: .63; Perfectionism: .53; Interpersonal Distrust: .77; Interoceptive Awareness: .56; Maturity Fears: .71. The Spearman-Brown prophecy formula [72] provided coefficients ranging from .82 to .97 if computed based on eight equivalent items.

Our aim was to create an easy-to-score short instrument allowing a sufficient level of variability in ratings. A content analysis was conducted on the 16 retained items and revealed that: (a) eight items (1, 2, 3, 7, 11, 12, 13, 15, 16) needed to be simplified (e.g., item 1: "I would like to look younger than I am" rather than "I wish that I could be younger"); and (b) four items (5, 6, 10, 14) needed to be modified to tap more into psychological states than into rigid personality traits (e.g., item 5: "I feel like talking with others" rather than "I can communicate with others easily"). The original and reformulated versions are reported in Table S1 of the online supplements. The response scale was replaced by a VAS comprising a 10-centimeter horizontal line defined by two extremes: "not at all" (0 cm) and "absolutely" (10 cm).

#### 3.2. Study 2: Validation and Gender-Based Measurement Invariance

The first-order CFA showed a satisfactory fit to the data [ $\chi^2(76) = 134.35, p < .001$ ; CFI = .976; TLI = .962; RMSEA = .029], while adding ETEC resulted in a decrease in fit [ $\chi^2(84) = 187.18, p < .001$ ; CFI = .957; TLI = .939; RMSEA = .037]. These results suggested that ETEC did not fully hold, and needed to be relaxed for one factor (Ineffectiveness) for which the two items were not equivalent (item 3  $\lambda = .89$ ; item 6  $\lambda = .52$ ). This model was re-estimated and provided a level of fit comparable to the model without ETEC [ $\chi^2(83) = 153.94, p < .001$ ; CFI = .971; TLI = .958; RMSEA = .031].

Interestingly, the second-order CFA also showed a satisfactory fit to the data [ $\chi^2(103) = 229.31, p < .001$ ; CFI = .948; TLI = .939; RMSEA = .037], supporting its adequacy. However, parameter estimates revealed that the loadings of the Perfectionism, Interoceptive Awareness and Interpersonal Distrust factors on the second-order factor remained small (below .300), supporting the idea that these reflect personality characteristics associated with ED rather than ED symptoms. Thus, an alternative model was estimated in which five first-order factors (Drive for Thinness, Bulimia, Body Dissatisfaction, Ineffectiveness, Maturity Fears) were specified as linked to the ED second-order factor, while the remaining first-order factors (Perfectionism, Interoceptive Awareness, Interpersonal Distrust) were simply correlated to the second-order factor. This model provided a degree of fit [ $\chi^2(100) = 225.02, p < .001$ ; CFI = .948; TLI = .938; RMSEA = .037] similar to that of the previous model. This model was retained for the following analyses, and its parameter estimates are reported in Table 1. First-order scales had modest to acceptable Cronbach's alpha: Drive for Thinness: .78; Bulimia: .64; Body Dissatisfaction: .63; Ineffectiveness: .63; Perfectionism: .68; Interpersonal Distrust: .76; Interoceptive Awareness: .60; Maturity Fears: .60 (Spearman-Brown coefficients for eight equivalent items ranged from .86 to .93). The reliability of the full scale also proved acceptable ( $\alpha = .76$ ).

Results from the gender-based measurement invariance tests are reported in Table S2 of the online supplements. All of CFI, TLI and RMSEA indicated adequate model fit, and most  $\Delta$ CFI and  $\Delta$ RMSEA remained under their respective cut-offs of .01 and .015. The only step at which  $\Delta$ CFI and  $\Delta$ RMSEA exceeded the cut-off scores was when ETEC were added, again suggesting that ETEC needed to be relaxed for one factor (Ineffectiveness). Remaining models were thus estimated based on partial ETEC.

### 3.3 Study 3: Convergent Validity of the EDI-VS with the EDI

The results from Study 3 are reported in Table 2. These results revealed that the Drive for Thinness ( $z$ -score comparisons ranging from 2.92 to 6.64), Bulimia (2.98 to 4.34), Ineffectiveness (2.22 to 5.05), Perfectionism (2.94 to 5.95) and Interpersonal Distrust (4.00 to 6.73) scales, as well as the full scale (4.36 to 7.74), were more significantly related to their corresponding EDI scales than to the other EDI scales. However, the results also showed that, in very few occasions, the Body Dissatisfaction (*vs.* full scale,  $z = 0.00$ ), Interoceptive Awareness (*vs.* drive for thinness,  $z = 1.70$ ; *vs.* Body Dissatisfaction,  $z = 1.82$ ) and Maturity Fears (*vs.* Perfectionism,  $z = 1.78$ ) scales were not significantly more related to their corresponding EDI scale than to the other EDI scales. Finally, the results indicated that the scale score reliability of the EDI-VS ( $\alpha = .70$  to .85, or from .90 to .96 when the Spearman-Brown prophecy formula was applied to eight equivalent items) and of the original EDI ( $\alpha = .78$  to .85) were satisfactory.

### 3.4. Study 4: Convergent validity of the EDI-VS with measures of related constructs

The results from Study 4 are reported in Table 3. The reliability of the different instruments was acceptable to fully satisfactory ( $\alpha = .70$  to .89). All EDI-VS scales were positively and significantly correlated with the global EAT-26 score. Results from the  $z$ -score comparisons revealed that the full scale presented a significantly higher correlation with the EAT-26 than the other scales ( $z$ -score range: 2.26 to 3.23), except for Maturity Fears (1.43), Bulimia (2.02), and Interoceptive Awareness (1.80). Most EDI-VS scales were positively correlated with the global score of the SPAS. Results from the  $z$ -score comparisons revealed that the Drive for Thinness (2.44 to 3.81), Body Dissatisfaction (3.65 to 4.59), Ineffectiveness (2.56 to 3.51), and full EDI-VS (3.90 to 5.00) scales had significantly higher correlations with the SPAS than the Perfectionism, Interoceptive Awareness and Interpersonal Distrust scales. Additionally, the (a) Body Dissatisfaction (3.10 and 2.81), and full (4.42 and 3.71) scales had significantly higher correlations with the SPAS than the Bulimia and Maturity Fears scales; (b) the EDI-VS full scale had a significantly higher correlation with the SPAS than the Drive for Thinness (2.55). Finally, the results revealed that most EDI-VS scales were significantly and negatively correlated with the RSEI. The  $z$ -score comparisons showed that the Drive for Thinness (3.44), Bulimia (2.44), Body Dissatisfaction (3.57), Ineffectiveness (4.30), Maturity Fears (2.99), and full (5.15) scales had significantly higher correlations with the RSEI than the Perfectionism scale. Also, the Ineffectiveness scale (2.59 to 3.60) and the EDI-VS full scale (3.65 to 4.14) presented significantly higher correlations

with the RSEI than the Bulimia, Interpersonal Distrust, and Interoceptive Awareness scales. Moreover, the Body Dissatisfaction (2.25) scale had a significantly higher correlation with the RSEI than the Interoceptive Awareness scale. Lastly, the EDI-VS full scale (2.58 to 3.68) had a significantly higher correlation with the RSEI than the Drive for Thinness, Body Dissatisfaction, and Maturity Fears scales.

### **3. 5. Study 5: Criterion-Related Validity of the EDI-VS**

Means, standard deviations and effect sizes for the EDI-VS scales and full scale are presented in Table 4. The results from these analyses showed that clinical participants obtained higher scores than non-clinical participants. However, no significant differences were found for the Bulimia scale, or for the Interpersonal Distrust scale when the Bonferroni correction was applied.

### **4. Discussion**

Our main objective was to develop and validate a very short version of the Eating Disorder Inventory. Findings from the first study provided preliminary support to the factor validity of the EDI-VS. The traditional answer scale was then replaced by a 10-centimeter VAS, and the items were adjusted accordingly. The second study then directly tested, and supported, the psychometric properties of this revised VAS version of the EDI-VS and its measurement invariance across genders. While the reliability of the full EDI-VS was fully satisfactory, the reliability of the subscales remained near the lower limit of acceptability, which is likely due to the limited number of items used to measure each EDI-VS dimension (2 items) as reliability coefficients are positively related to the number of items [73].

Study 3 showed that answers to the EDI-VS were highly correlated to the corresponding global and scale scores from the original EDI, supporting the convergent validity of the EDI-VS. In addition, they also showed that Body Dissatisfaction, Interoceptive Awareness and Maturity Fears scales were generally not significantly more related to their corresponding EDI scales than to the other EDI scales. This observation may be related to a loss of precision of the EDI-VS due to the retention of a lower number of items reformulated to tap more into fluid psychological states than rigid personality traits. Consequently, the hypothesis that the EDI-VS scales would be more strongly related to corresponding EDI scales than to other EDI scales was only partially confirmed.

The findings from the fourth study showed that all EDI-VS scales were significantly correlated with the EAT-26, with the strongest relation found between the full scale of the EDI-VS and the EAT-26. These results were thus fully in line with our expectations [18, 45]. Additionally, most EDI-VS scales (except for Bulimia, Perfectionism, Interpersonal Distrust, and Interoceptive Awareness) were positively and significantly correlated with the SPAS, with the strongest correlations found for the Drive for Thinness, Body Dissatisfaction, Ineffectiveness and full EDI-VS scales. Nevertheless, because the correlations between the Bulimia scale of the EDI-VS and the SPAS was not significant as expected, these results only partially support our hypotheses [49, 50]. Finally, the results showed that most of the EDI-VS scales (except for Perfectionism, Interpersonal Distrust, and Interoceptive Awareness) were significantly and negatively correlated with the RSEI, with the strongest correlations found for Drive for Thinness, Body Dissatisfaction, Ineffectiveness and full EDI-VS scales. However, because the correlations between the Perfectionism and Interpersonal Distrust scales of the EDI-VS and the RSEI were not significant as expected, these results only partially support our hypotheses. These non-significant associations may be related to a loss of precision of the EDI-VS when compared to the longer original EDI. Future studies would be needed to see whether all these results could be replicated.

The results from the fifth study regarding the criterion-related validity of the EDI-VS are consistent with those from studies relying on other versions of the EDI [36, 39, 40], but also showed a lack of significant group-differences for Bulimia and Interpersonal Distrust scales. The lack of difference on Bulimia can be explained by the composition of the clinical sample, which included 90% of girls suffering from restrictive anorexia nervosa (i.e., who had not engaged in binge-eating behaviors during the current episode). The Interpersonal Distrust scale reflects the inability to express thoughts and feelings to others, and to form close relationships [18]. Thus, the lack of significant difference on this scale may be related to the fact that 74% of the patients were hospitalized in a psychiatric unit in relative isolation, a context that may considerably limit their negative thoughts and feelings toward others.

Limitations of the current series of studies must also be taken into account. First, the current studies were based on samples of French adolescents. Until the generalizability of this instrument to other cultural or linguistic groups can be investigated, its cross-cultural or cross-linguistic use cannot be recommended. Additionally, the criterion-related validity of the EDI-VS was only assessed for anorexic female patients. Therefore, examining the criterion-related validity of the EDI-VS across larger non-

clinical and clinical inpatient and outpatient mixed-gender samples should be a future research priority. Furthermore, the first two studies were performed among relatively large samples of participants (from 291 to 900), whereas the last two studies were performed among smaller and less diversified samples (from  $N = 38$  to  $N = 92$ ), with the fifth study including only female participants. Consequently, the results from the third to the fifth studies should be interpreted with caution. It should be noted, however, that even though they differed in size, the samples from the first to the fourth studies were comparable in terms of their composition (mean age, body mass index, and gender). Still, replicating these results among larger samples should also be a future research priority. Finally, the EDI-VS may cause a loss of diagnostic accuracy relative to the original (longer) EDI, because it is impossible to develop an instrument that is simultaneously very short and yet complete in its coverage of ED symptoms.

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Table 1  
Standardized Loadings, Uniqueness and Latent Factor Correlations of the EDI-VS

Factor/item	Study 1		Study 2		HO $\lambda$	HO $\delta$			
	$\lambda$	$\delta$	$\lambda$	$\delta$					
BD					.945	.107			
Item 4	.791	.375	.664	.559					
Item 10	.771	.406	.689	.526					
BU					.379	.856			
Item 11	.843	.289	.642	.588					
Item 15	.657	.568	.733	.462					
DT					.848	.281			
Item 2	.874	.236	.825	.319					
Item 13	.890	.208	.774	.401					
IN					.655	.571			
Item 3	.665	.557	.859	.262					
Item 6	.697	.514	.534	.715					
PF					---	---			
Item 8	.583	.660	.723	.477					
Item 16	.613	.625	.706	.501					
MF					.327	.893			
Item 1	.707	.500	.699	.512					
Item 12	.775	.399	.621	.614					
ID					---	---			
Item 5	.766	.413	.777	.396					
Item 7	.811	.343	.788	.379					
IA					---	---			
Item 9	.634	.598	.627	.607					
Item 14	.620	.615	.696	.515					
Correlations	BD	BU	DT	IN	PF	MF	ID	IA	HO
BD		---	---	---	---	---	---	---	---
BU	.119		---	---	---	---	---	---	---
DT	.459*	.175*		---	---	---	---	---	---
IN	.354*	.118	.346*		---	---	---	---	---
PF	-.112	.325*	.251*	.136			-.092	.028	-.137*
MF	.027	.116	.112	.440*	.115			---	---
ID	.048	.072	-.138	.292*	-.231*	.333*		.033	.140*
IA	.192*	.334*	.309*	.637*	.184	.462*	.200*		.295*

Note. Essentially tau-equivalent constraints (ETEC) are imposed on unstandardized factor loadings, whereas here we report standardized model parameters. Correlations from the first study are reported under the diagonal, correlations from the second study are reported above the diagonal.

$\lambda$  = factor loading;  $\delta$  = uniquenesses; VS = very short form; DT = drive for thinness; BU = bulimia; BD = body dissatisfaction; IN = ineffectiveness; PF = perfectionism; ID = interpersonal distrust; IA = interoceptive awareness; MF = maturity fears; HO = higher-order eating disorders factor.

\* $p < .05$  for the latent factor correlation. All loadings and uniquenesses are significant at  $p < .05$ .

Table 2  
*Correlations and Convergent Validity of the EDI-VS with the Original EDI*

Scales	DT-EDI	BU-EDI	BD-EDI	IN-EDI	PF-EDI	ID-EDI	IA-EDI	MF-EDI	FS-EDI <sup>†</sup>	$\alpha$
DT-VS	<u>.89**(.142)</u>	.25(.26)	.73**(.93)	.02(.02)	.25(.26)	.22(.22)	.33*(.34)	.23(.23)	.73**(.93)	.85
BU-VS	.13(.13)	<u>.72**(.91)</u>	.12(.12)	.09(.09)	.15(.15)	.05(.05)	.37**(.39)	.13(.13)	.38**(.40)	.70
BD-VS	.57**(.65)	.40**(.42)	<u>.83**(.1.19)</u>	.24(.24)	.15(.15)	.36*(.38)	.54**(.60)	.42**(.45)	.83**(.1.19)	.71
IN-VS	.08(.08)	.02(.02)	.17(.17)	<u>.63**(.74)</u>	-.27(-.28)	.01(.01)	.27(.28)	.08(.08)	.32*(.33)	.73
PF-VS	.18(.18)	.23(.23)	.04(.04)	-.37**(-.39)	<u>.66**(.79)</u>	.13(.13)	.17(.17)	.21(.21)	.09(.09)	.70
ID-VS	-.04(-.04)	-.17(-.17)	.12(.12)	.19(.19)	-.01(-.01)	<u>.74**(.95)</u>	-.09(-.09)	.10(.10)	.07(.07)	.74
IA-VS	.36**(.38)	.07(.07)	.35*(.37)	-.09(-.09)	.25(.26)	.19(.19)	<u>.59**(.68)</u>	.25(.26)	.32*(.33)	.70
MF-VS	.29*(.30)	.14(.14)	.23(.23)	.13(.13)	.46**(.50)	.32*(.33)	.41**(.44)	<u>.69**(.85)</u>	.48**(.52)	.71
FS-VS <sup>†</sup>	.74**(.95)	.49**(.54)	.77**(.1.02)	.29*(.30)	.28*(.29)	.34*(.35)	.61**(.71)	.51**(.56)	<u>.93**(.1.66)</u>	.76
$\alpha$	.79	.83	.81	.79	.81	.78	.80	.81	.85	=

*Note.* EDI = Eating Disorder Inventory; VS = very short form; DT = drive for thinness; BU = bulimia; BD = body dissatisfaction; FS = full scale; IN = ineffectiveness; PF = perfectionism; ID = interpersonal distrust; IA = interoceptive awareness; MF = maturity fears;  $\alpha$  = Cronbach's alpha; Fisher's  $r$  to  $z$  transformations are in parentheses; <sup>†</sup>the full-scale scores do not include the PF, IA and ID scales; \*  $p < .05$ ; \*\*  $p < .01$ .

Table 3  
*Correlations and Convergent Validity of the EDI-VS with Criterion Measures*

EDI-VS	DT	BU	BD	IN	PF	ID	IA	MF	FS <sup>†</sup>	Comparisons	$\alpha$
EAT-26	.38**(.40)	.34**(.35)	.32**(.33)	.34**(.35)	.23*(.23)	.23*(.23)	.32**(.33)	.40**(.42)	.52**(.58)	FS > DT, BD, IN, PF, ID	.89
SPAS	.46**(.50)	.20(.20)	.57**(.65)	.46**(.50)	-.05(-.05)	.15(.15)	.03(.03)	.22*(.22)	.59**(.68)	DT, BD, IN, FS > PF, IA, ID BD, FS > BU, MF FS > DT	.76
RSEI	-.40**(-.42)	-.27**(-.28)	-.44**(-.47)	-.55**(-.62)	.07(.07)	-.18(-.18)	-.13(-.13)	-.31**(-.32)	-.59**(-.68)	DT, BU, BD, IN, MF, FS > PF IN, FS > BU, ID, IA BD > IA FS > DT, BD, MF	.82
$\alpha$	.77	.80	.71	.71	.72	.70	.73	.72	.80		

Note. \*  $p < .05$ ; \*\*  $p < .01$ ; EDI = Eating Disorder Inventory; VS = very short form; DT = drive for thinness; BU = bulimia; BD = body dissatisfaction; FS = full scale; IN = ineffectiveness; PF = perfectionism; ID = interpersonal distrust; IA = interoceptive awareness; MF = maturity fears; EAT-26 = 26-item Eating Attitudes Test; SPAS = Social Physique Anxiety scale; RSEI = Rosenberg Self-Esteem Inventory.  $\alpha$  = Cronbach's alpha; Fisher's  $r$  to  $z$  transformations are in parentheses; <sup>†</sup>Full-scale score excludes PF, IA and ID scales.

Table 4  
*Criterion-Related Validity of the EDI-VS*

	Non-clinical sample ( <i>N</i> = 19) Mean ( <i>SD</i> )	Anorexic sample ( <i>N</i> = 19) Mean ( <i>SD</i> )	<i>t</i> (36)	<i>p</i>	<i>d</i>
<b>EDI-VS</b>					
DT	6.24 (5.71)	14.54 (5.77)	4.46	<.001	1.45
BU	1.94 (3.05)	4.62 (6.02)	1.73	.09	0.56
BD	7.48 (6.38)	15.55 (3.87)	4.71	<.001	1.53
IN	8.33 (4.37)	16.20 (3.55)	6.10	<.001	1.98
PF	3.03 (2.20)	11.08 (5.25)	6.17	<.001	1.99
ID	6.30 (5.45)	10.55 (3.90)	2.76	.009	0.90
IA	4.61 (3.50)	11.22 (6.28)	4.01	<.001	1.30
MF	3.14 (3.39)	7.83 (5.17)	3.31	.002	1.07
Full-scale <sup>†</sup>	27.12 (12.90)	58.73 (14.91)	6.99	<.001	2.27

*Note.* EDI = Eating Disorder Inventory; VS = very short form; DT = drive for thinness; BU = bulimia; BD = body dissatisfaction; IN = ineffectiveness; PF = perfectionism; ID = interpersonal distrust; IA = interoceptive awareness; MF = maturity fears; SD = standard deviation. <sup>†</sup>the full-scale scores do not include the PF, IA and ID scales; *d* = Effect sizes.

**Online Supplements for:  
Development and Factor Validity of a Very Short Form of the Eating Disorder Inventory**

These online supplements comprise three sections, including:

- (1) Results from the development of the preliminary 16-item EDI-VS version (Study 1).
- (2) French and English versions of the original EDI and EDI-VS items.
- (3) Goodness-of-fit indices of the gender measurement invariance tests conducted on the EDI-VS (Study 2).

**Development of the preliminary 16-item EDI-VS (Study 1).**

For the seven Drive for Thinness items, the CFA analysis exhibited acceptable goodness-of-fit indices ( $\chi^2 = 38.73$ ,  $df = 14$ ,  $p < .001$ ; CFI = .961; TLI = .942; RMSEA = .078; RMSEA 90% CI = .049–.108) the parameter estimates and of the modification indices suggested that one item should be deleted (i.e., item 1). A CFA was then estimated on the six remaining items (i.e., 7, 11, 16, 25, 32 and 49) and indicated acceptable fit for a one-factor model ( $\chi^2 = 29.78$ ,  $df = 9$ ,  $p < .001$ ; CFI = .964; TLI = .940; RMSEA = .089; RMSEA 90% CI = .055–.126). In this model, (a) the item-total correlations ranged from .60 (item 49) to .79 (item 7); (b) the standardized loadings were significant and ranged from .58 (item 11) to .89 (item 7); and (c) the internal consistency coefficient was acceptable ( $\alpha = .87$ ). Items 7 and 16 were retained for the development of the EDI-VS.

For the seven Bulimia items, the CFA analysis exhibited acceptable goodness-of-fit indices ( $\chi^2 = 28.59$ ,  $df = 14$ ,  $p = .01$ ; CFI = .945; TLI = .917; RMSEA = .06; RMSEA 90% CI = .027–.091), but the modification indices suggested that two items should be deleted (i.e., items 53 and 61). A CFA was then estimated on the five remaining items (i.e., 4, 5, 28, 38 and 46) and indicated acceptable fit for a one-factor model ( $\chi^2 = 6.78$ ,  $df = 5$ ,  $p = .24$ ; CFI = .992; TLI = .984; RMSEA = .035; RMSEA 90% CI = .000–.094). In this model, (a) the item-total correlations ranged from .37 (item 4) to .59 (item 5); (b) the standardized loadings were significant and ranged from .40 (item 4) to .74 (item 46); and (c) the internal consistency coefficient was acceptable ( $\alpha = .74$ ). Items 5 and 46 were retained for the development of the EDI-VS.

For the nine Body Dissatisfaction items, the CFA analysis exhibited unsatisfactory goodness-of-fit indices ( $\chi^2 = 163.36$ ,  $df = 27$ ,  $p < .001$ ; CFI = .812; TLI = .749; RMSEA = .13; RMSEA 90% CI = .113–.152) and the modification indices suggested that four items should be deleted (i.e., items 2, 9, 45 and 55). A CFA was then estimated on the five remaining items (i.e., 12, 19, 31, 59 and 62) and indicated acceptable fit for a one-factor model ( $\chi^2 = 5.50$ ,  $df = 5$ ,  $p = .36$ ; CFI = .998; TLI = .996; RMSEA = .019; RMSEA 90% CI = .000–.085). In this model, (a) the item-total correlations ranged from .40 (item 31) to .55 (item 62); (b) the standardized loadings were significant and ranged from .55 (item 12) to .81 (item 59); and (c) the internal consistency coefficient was acceptable ( $\alpha = .80$ ). Items 19 and 59 were retained for the development of the EDI-VS.

For the ten Interoceptive Awareness items, the CFA analysis exhibited unsatisfactory goodness-of-fit indices ( $\chi^2 = 70.60$ ,  $df = 35$ ,  $p < .001$ ; CFI = .848; TLI = .805; RMSEA = .059; RMSEA 90% CI = .039–.079) and the modification indices suggested that three items should be deleted (i.e., items 26, 33 and 40). A CFA was then estimated on the seven remaining items (i.e., 8, 21, 44, 47, 51, 60 and 64) and indicated acceptable fit for a one-factor model ( $\chi^2 = 15.89$ ,  $df = 14$ ,  $p = .32$ ; CFI = .989; TLI = .983; RMSEA = .022; RMSEA 90% CI = .000–.063). In this model, (a) the item-total correlations ranged from .27 (item 47) to .44 (item 8 and 21); (b) the standardized loadings were significant and ranged from .32 (item 47) to .58 (item 8); and (c) the internal consistency coefficient was modest ( $\alpha = .68$ ). Items 8 and 21 were retained for the development of the EDI-VS.

For the seven Interpersonal Distrust items, the CFA analysis exhibited unsatisfactory goodness-of-fit indices ( $\chi^2 = 158.58$ ,  $df = 14$ ,  $p < .001$ ; CFI = .616; TLI = .424; RMSEA = .19; RMSEA 90% CI = .163–.215) and the modification indices suggested that three items should be deleted (i.e., items 17, 30 and 34). A CFA was then estimated on the four remaining items (i.e., 15, 23, 54 and 57) and indicated acceptable fit for a one-factor model ( $\chi^2 = 3.70$ ,  $df = 2$ ,  $p = .16$ ; CFI = .986; TLI = .958; RMSEA = .054; RMSEA 90% CI = .000–.140). In this model, (a) the item-total correlations ranged from .13 (item 54) to .46 (item 23); (b) the standardized loadings were significant and ranged from .11 (item 54) to .79 (item 15); and (c) the internal consistency coefficient was modest ( $\alpha = .56$ ). Items 15 and 23 were retained for the development of the EDI-VS.

For the six Perfectionism items, the CFA analysis exhibited satisfactory goodness-of-fit indices ( $\chi^2 = 15.66$ ,  $df = 9$ ,  $p = .07$ ; CFI = .948; TLI = .914; RMSEA = .050; RMSEA 90% CI = .000–.091), but the parameter estimates and of the modification indices suggested that two items should be deleted (i.e., items 13 and 29). A CFA was then estimated on the four remaining items (i.e., 36, 43, 52 and 63) and indicated acceptable fit for a one-factor model ( $\chi^2 = 2.50$ ,  $df = 2$ ,  $p = .29$ ; CFI = .995; TLI = .984; RMSEA = .029; RMSEA 90% CI = .000–.124). In this model, (a) the item-total correlations ranged from .37 (item 43) to .43 (item 52); (b) the standardized loadings were significant and ranged from .48 (item 43) to .59 (item 52); and (c) the internal consistency coefficient was modest ( $\alpha = .62$ ). Items 36 and 52 were retained for the development of the EDI-VS.

For the eight Maturity Fears items, the CFA analysis exhibited unsatisfactory goodness-of-fit indices ( $\chi^2 = 83.77$ ,  $df = 20$ ,  $p < .001$ ; CFI = .690; TLI = .566; RMSEA = .105; RMSEA 90% CI = .082–.128) and the modification indices suggested that four items should be deleted (i.e., items 14, 22, 35 and 58). A CFA was then estimated on the four remaining items (i.e., 3, 6, 39 and 48) and indicated acceptable fit for a one-factor model ( $\chi^2 = 0.51$ ,  $df = 2$ ,  $p = .78$ ; CFI = 1.00; TLI = 1.04; RMSEA = .000; RMSEA 90% CI = .000–.076). In this model, (a) the item-total correlation ranged from .23 (item 3) to .35 (item 39); (b) the standardized loadings were significant and ranged from .30 (item 3) to .84 (item 48); and (c) the internal consistency coefficient was modest ( $\alpha = .63$ ). Items 6 and 48 were retained for the development of the EDI-VS.

For the ten Ineffectiveness items, the CFA analysis exhibited unsatisfactory goodness-of-fit indices ( $\chi^2 = 123.27$ ,  $df = 35$ ,  $p < .001$ ; CFI = .743; TLI = .669; RMSEA = .093; RMSEA 90% CI = .076–.111) and the modification indices suggested that five items should be deleted (i.e., items 10, 20, 24, 42 and 56). A CFA was then estimated on the five remaining items (i.e., 18, 27, 37, 41 and 50) and indicated acceptable fit for a one-factor model ( $\chi^2 = 6.25$ ,  $df = 5$ ,  $p = .28$ ; CFI = .992; TLI = .984; RMSEA = .029; RMSEA 90% CI = .000–.091). In this model, (a) the item-total correlation ranged from .20 (item 50) to .30 (item 37); (b) the standardized loadings were significant and ranged from .37 (item 50) to .68 (item 27); and (c) the internal consistency coefficient was acceptable ( $\alpha = .70$ ). Items 27 and 41 were retained for the development of the EDI-VS.

Table S1

## EDI-VS items

†N°	Original EDI Items	N°	Final EDI-VS Items	Scale
6	J'aimerais être plus jeune ( <i>I wish that I could be younger</i> )	1‡	J'aimerais paraître plus jeune que je ne le suis ( <i>I would like to look younger than I am</i> )‡	MF
16	Je suis terrifié(e) par l'idée de grossir ( <i>I am terrified of gaining weight</i> )	2‡	J'ai très peur de grossir ( <i>I am very afraid of gaining weight</i> )	DT
41	J'ai une piètre opinion de moi-même ( <i>I have a low opinion of myself</i> )	3‡	J'ai une mauvaise opinion de moi-même ( <i>I have a poor opinion of myself</i> )	IN
19	Je suis satisfait(e) de ma silhouette ( <i>I feel satisfied with the shape of my body</i> )	4	Je suis satisfait(e) de ma silhouette ( <i>I feel satisfied with the shape of my body</i> )*	BD
23	Je communique facilement avec les autres ( <i>I can communicate with others easily</i> )	5‡	J'ai envie de discuter avec les autres ( <i>I feel like talking with others</i> )*	ID
27	Je ne me sens pas à la hauteur ( <i>I feel inadequate</i> )	6‡	Je me sens à la hauteur quelle que soit la situation ( <i>I always feel up to the task, no matter what</i> )*	IN
15	J'exprime mes émotions ouvertement ( <i>I am open about my feelings</i> )	7‡	Je montre facilement mes émotions aux autres ( <i>I show my feelings easily to others</i> )*	ID
36	Je déteste ne pas être le(la) meilleur(e) quand je fais les choses ( <i>I hate being less than best at things</i> )	8	Je déteste ne pas être le(la) meilleur(e) quand je fais les choses ( <i>I hate being less than best at things</i> )	PF
8	J'ai peur quand mes émotions sont trop fortes ( <i>I get frightened when my feelings are too strong</i> )	9	J'ai peur quand mes émotions sont trop fortes ( <i>I get frightened when my feelings are too strong</i> )	IA
59	Je trouve que mes fesses sont trop grosses ( <i>I think my buttocks are too large</i> )	10‡	Certaines parties de mon corps sont trop fortes ( <i>Certain parts of my body are too large</i> )	BD
46	Je mange modérément devant les autres et je me gave quand ils sont partis ( <i>I eat moderately in front of others and stuff myself when they're gone</i> )	11‡	J'ai envie de manger modérément devant les autres et de me gaver quand ils sont partis ( <i>I feel like eating moderately in front of others and stuffing myself when they're gone</i> )	BU
48	Je trouve qu'on est plus heureux quand on est enfant ( <i>I feel that people are happiest when they are children</i> )	12‡	J'étais plus heureux(se) lorsque j'étais enfant ( <i>I was happier as a kid</i> )‡	MF
7	Je pense à faire un régime ( <i>I think about dieting</i> )	13‡	J'ai envie de faire un régime ( <i>I feel like going on a diet</i> )	DT
21	Je sens que je m'embrouille face aux émotions que je ressens ( <i>I get confused about what emotion I am feeling</i> )	14‡	J'arrive à contrôler mes émotions ( <i>I manage to control my feelings</i> )*	IA
5	Je me gave de nourriture ( <i>I stuff myself with food</i> )	15‡	J'ai envie de me gaver de nourriture ( <i>I feel like stuffing myself with food</i> )	BU
52	Je pense que je dois faire les choses parfaitement ou ne pas les faire du tout ( <i>I feel that I must do things perfectly or not do them at all</i> )	16‡	Je fais les choses parfaitement ( <i>I do things perfectly</i> )	PF

Note. \* reversed score; EDI = Eating Disorder Inventory; DT = drive for thinness; BU = bulimia; BD = body dissatisfaction; IN = ineffectiveness; PF = perfectionism; ID = interpersonal distrust; IA = interoceptive awareness; MF = maturity fears; VS = very short form. †This number corresponds to the item number in the original EDI; ‡items that were modified to develop the preliminary version of the EDI-VS.

Table S2  
*Goodness-of-fit Indices of the Gender Measurement Invariance Tests Conducted on the EDI-VS First- and Second-Order Models*

Study	Model	$\chi^2$	df	CFI	TLI	RMSEA	90% CI	$\Delta\chi^2(df)$	$\Delta CFI$	$\Delta TLI$	$\Delta RMSEA$		
Study 2	CFA, gender-invariance tests – first order	2-1	1-Configural invariance without ETEC	237.167**	152	.965	.945	.035	.026-.044	-	-	-	
			2- $\lambda$ invariant without ETEC	244.040**	160	.966	.949	.034	.025-.043	9.10 (8)	+0.001	+0.004	+0.003
			3- $\lambda$ invariant with ETEC	296.433**	168	.948	.926	.041	.033-.049	45.55 (16)**	-.017	-.019	+0.009
			3'- $\lambda$ invariant with partial ETEC	264.607**	167	.960	.943	.036	.028-.044	25.80 (15)*	-.005	-.002	+0.001
			4- $\lambda$ , $\tau$ s invariant	288.384**	175	.954	.937	.038	.030-.046	25.07 (8)**	-.006	-.006	-.002
			5- $\lambda$ , $\tau$ s, $\delta$ s invariant	302.044**	191	.955	.943	.036	.028-.043	16.48 (16)	+0.001	+0.006	-.002
			6- $\lambda$ , $\tau$ s, $\delta$ s, $\zeta/\phi$ invariant	360.516**	227	.946	.943	.036	.029-.043	58.45 (36)*	-.009	.000	.000
	7- $\lambda$ , $\tau$ s, $\delta$ s, $\zeta/\phi$ , $\eta^{1rd}$ s invariant	387.427**	235	.938	.937	.038	.031-.045	28.80 (8)**	-.008	-.006	+0.002		
	CFA, gender-invariance tests – second order	2-2	1- $\lambda$ , $\tau$ s, $\delta$ s invariant	391.198**	225	.933	.928	.041	.034-.047	-	-	-	-
			2- $\lambda$ , $\tau$ s, $\delta$ s, $\gamma$ s invariant	409.073**	229	.927	.923	.042	.035-.048	16.41 (4)**	-.006	-.005	+0.001
			3- $\lambda$ , $\tau$ s, $\delta$ s, $\gamma$ s, $\eta^{1rd}$ invariant	412.851**	233	.927	.925	.041	.035-.048	3.41 (4)	.000	+0.002	-.001
			4- $\lambda$ , $\tau$ s, $\delta$ s, $\gamma$ s, $\eta^{1rd}$ , $\zeta$ s invariant	413.655**	238	.929	.928	.040	.034-.047	3.15 (5)	+0.002	+0.003	-.001
			5- $\lambda$ , $\tau$ s, $\delta$ s, $\gamma$ s, $\eta^{1rd}$ , $\zeta$ s, $\zeta^{2rd}$ invariant	424.818**	242	.926	.926	.041	.034-.047	12.03 (4)*	-.003	-.002	+0.001
	6- $\lambda$ , $\tau$ s, $\delta$ s, $\gamma$ s, $\eta^{1rd}$ , $\zeta$ s, $\zeta^{2rd}$ , $\eta^{2rd}$ invariant	437.191**	243	.921	.922	.042	.036-.048	15.21 (1)**	-.005	-.004	+0.001		

*Note.* CFA = confirmatory factor analytic model;  $\chi^2$  = Chi-square; df = degrees of freedom; CFI = comparative fit index; TLI = Tucker-Lewis index; RMSEA = root mean square error of approximation; RMSEA 90% CI = root mean square error of approximation 90% confidence interval; ETEC = essentially tau-equivalent constraints; VS = very short form;  $\lambda$  = factor loading;  $\tau$  = intercept;  $\delta$  = uniquenesses;  $\zeta$  = factor variance;  $\zeta^{2rd}$  = second-order factor variance;  $\phi$  = factor covariance;  $\gamma$  = structural relations among latent constructs;  $\zeta$  = factor error terms;  $\eta^{1rd}$  = first-order factor means;  $\eta^{2rd}$  = second-order factor means;  $\Delta\chi^2$  = change in goodness-of-fit  $\chi^2$  relative to the preceding model;  $\Delta df$  = change in degrees of freedom relative to the preceding model;  $\Delta CFI$  = change in comparative fit index relative to the preceding model;  $\Delta RMSEA$  = change in root mean square error of approximation relative to the preceding model. \* $p < .05$ ; \*\* $p < .01$ .