Development and Validation of the Self-Conscious Emotion Regulatory Efficacy Scale (SCERES)

Yan Wu, Qimin Liang, and Bi Li

Abstract
Self-conscious emotion regulatory efficacy is very important in regulating and mediating psychosocial function. We developed the Self-Conscious Emotion Regulatory Efficacy Scale (SCERES) to assess self-efficacy in managing shame/embarrassment, guilt, envy, and pride, and tested it using a sample of 674 university students from mainland China. Exploratory and confirmatory factor analyses were conducted to determine the structure of the SCERES. Its internal consistency and stability were evaluated by examining composite and test–retest reliability. Construct validity was also examined. The results showed that the SCERES has good psychometric properties and can be considered a reliable and valid instrument for the measurement of self-conscious emotion regulatory efficacy.

Keywords
self-conscious emotion, emotion regulation, self-efficacy

Regulatory emotional self-efficacy (also termed affective self-regulatory efficacy) concerns people’s beliefs in how well they can manage their emotional lives (Bandura, Caprara, Barbaranelli, Gerbino, & Pastorelli, 2003). It emphasizes efforts to regulate one’s impulsive emotional tendencies. As a specific reflection of self-efficacy in the domain of emotional regulation, this characteristic plays a vital role in regulating and mediating psychosocial function. People with stronger regulatory emotional self-efficacy are more likely to display prosocial behavior, restrain delinquency, and be comfortable with their emotions (Alessandri, Caprara, Eisenberg, & Steca, 2009; Bandura et al., 2003; Caprara et al., 2008; Caprara, Gerbino, Piaciolo, Di Giunta, & Pastorelli, 2010; Caprara, Giunta, Pastorelli, & Eisenberg, 2013). Conversely, people with low regulatory emotional self-efficacy are prone to fail in regulating their emotions and thoughts under taxing stressors and to develop depression (Bandura et al., 2003; Caprara et al., 2010).

Two important trends characterize the study of regulatory emotional self-efficacy. First, research has shifted from the examination of basic or first-order emotions to that of self-conscious emotional self-efficacy (Tracy & Robins, 2004). Initial research focused on basic emotions, such as joy, anger/irritation, despondency/sadness, and fear, which are more evolutionarily driven (Izard, 2007, 2011). Self-conscious emotions, including shame/embarrassment, guilt, envy, and pride, require the development of sophisticated cognitive processes and have been studied only recently (Caprara, Giunta, et al., 2013). Among self-conscious emotions, the regulation of shame/embarrassment and guilt has received much scholarly attention (Caprara, Giunta, et al., 2013). In contrast, the regulation of emotions such as envy and pride has not been thoroughly examined, possibly due to the lack of available measurement tools. The management of different emotions reflects the functioning of different regulatory or motivational systems (Blanchard-Fields & Coats, 2008). Thus, the development of a reliable and valid instrument measuring the regulatory efficacy of self-conscious emotions is urgently needed.

Second, researchers have gradually focused specifically on multidimensional structure of the regulation of emotional self-efficacy (Caprara, Giunta, et al., 2013). Regulatory emotional self-efficacy is considered to have only two complementary components: self-efficacy in expressing positive emotions and regulating negative emotions (Alessandri, 2013; Tangney, Wagner, & Gramzow, 1992). Among self-conscious emotions, the regulation of shame/embarrassment and guilt has received much scholarly attention (Caprara, Giunta, et al., 2013). In contrast, the regulation of emotions such as envy and pride has not been thoroughly examined, possibly due to the lack of available measurement tools. The management of different emotions reflects the functioning of different regulatory or motivational systems (Blanchard-Fields & Coats, 2008). Thus, the development of a reliable and valid instrument measuring the regulatory efficacy of self-conscious emotions is urgently needed.

1Guangdong University of Foreign Studies, China
2Hong Kong University of Science and Technology, China

Corresponding Author:
Bi Li, School of Informatics, Guangdong University of Foreign Studies, Guangzhou, 510420, China.
Email: libi@gdufs.edu.cn
multidimensional structure of regulatory efficacy of self-conscious emotions under the Chinese culture.

To assess the self-efficacy, the Regulatory Emotional Self-Efficacy (RESE) scale was developed (Bandura et al., 2003; Caprara & Gerbino, 2001). It measures two dimensions: self-efficacy in regulating negative emotions and that in expressing positive emotions. Caprara et al. (2008) subsequently determined that the negative dimension was represented by a second-order factor comprising two emotions: despondency/distress and anger/irritation. The Multidimensional Negative Emotions Self-Regulatory Efficacy Scale (MNESRES) was developed to measure five self-efficacy beliefs regarding the management of anger/irritation, despondency/sadness, shame/embarrassment, guilt, and fear (Caprara, Giunta, et al., 2013). However, neither the RESE scale nor the MNESRES measures self-efficacy in managing pride and envy, which are very important in psychological dysfunction (Dou, Nie, Wang, & Li, 2012; Smith & Kim, 2007).

Thus, the objectives of this study were to (a) develop a reliable and valid instrument to assess people’s beliefs in how well they can manage self-conscious emotions, including shame/embarrassment, guilt, envy, and pride; and (b) evaluate the factor structure, internal consistency, and construct validity of the scale.

Method

Scale Development

The Self-Conscious Emotion Regulatory Efficacy Scale (SCERES) was developed using a pool of 19 items: The scale was developed in Chinese, with translation of MNESRES items. In total, 13 items were created to assess self-efficacy in the management of self-conscious emotions, such as shame/embarrassment, guilt, envy, and pride, and six items were taken directly from the MNESRES (Caprara, Giunta, et al., 2013). The SCERES assesses perceived self-efficacy in managing shame/embarrassment (six items, three from the MNESRES), guilt (five items, three from the MNESRES), envy (three items), and pride (five items). Responses to all items are structured by a 5-point Likert-type scale ranging from 1 (completely disagree) to 5 (strongly agree), with a higher score (simple sum) indicating a higher level of self-conscious emotion regulatory efficacy. Two psychological experts independently reviewed these items to confirm their appropriateness and suggest minor rewording.

Participants and Procedure

A total of 674 (34.7% male) students aged from 17 to 22 (M = 19.38; SD = 0.88) years from the same university in mainland China were recruited voluntarily to assess the scale. The students were distributed as follows: 17.6% were freshmen, 29.2% were sophomores, 47.4% were juniors, and 5.2% were seniors. They were randomly divided into two samples: Item quality and factor structure were assessed using Sample 1 (n = 328), and structure was clarified using Sample 2 (n = 346). The SCERES was administered on paper to both samples with administration to each sample as a group. No time limit was required when the students complete the scale.

As self-efficacy has been found to be correlated positively with self-esteem (Caprara & Steca, 2005), the relationship of self-conscious emotion regulatory efficacy with self-esteem was also considered by correlation. In addition to the SCERES, the Rosenberg Self-Esteem Scale was administered to students in Sample 2. This scale consists of 10 items measuring general self-esteem. Responses to all items are structured by a 4-point Likert-type scale (1 = completely false for me, 4 = completely true for me), with a higher score (simple sum) indicating a higher level of self-esteem. Cronbach’s alpha of the Rosenberg Self-Esteem Scale in this study was .850.

Test–retest reliability was assessed by readministering the scale to students in Sample 1 after a 3-month interval. To ensure anonymity while preserving the ability to match participants, the students were asked to provide the last four digits of their student numbers.

Data Analysis

Data analysis was performed in several stages. First, exploratory factor analysis (EFA) was performed on data from Sample 1 to determine the structure of the SCERES using Statistical Package for the Social Sciences (SPSS) software (version 18; IBM). Items with high factor loadings (higher than 0.30) and the fewest cross-loadings were selected. Then, a series of confirmatory factor analyses (CFA) was performed on data from Sample 2 to choose the best model and confirm item assignment using Mplus software (version 7.0, Muthén & Muthén). Third, because alpha values tend to underestimate reliability and can thus be misleading (Raykov, 1997), composite reliability of the SCERES was assessed. In addition, test–retest reliability was also used to assess the consistency of the derived scores based on the retained items. Finally, construct validity was investigated using correlation analyses of SCERES subscale and total scores. As self-efficacy has been found to be correlated positively with self-esteem (Caprara & Steca, 2005), the relationship of self-conscious emotion regulatory efficacy with self-esteem was also considered by their Pearson product-moment correlations. A missing data pattern analysis revealed that data were missing randomly. Thus, missing values were replaced by the means of variables.

Following generally accepted practice, we evaluated the fit of each model by examining multiple fit indices (Kline, 2010): the chi-squared test, root mean square error of approximation (RMSEA), Tucker–Lewis index (TLI), and comparative fit index (CFI). Conventional guidelines suggest that RMSEA values ≤0.08 indicate acceptable model fit, and those ≤0.05 indicate good model fit; CFI and TLI values ≥0.90 indicate adequate model fit (Kline, 2010).
### Results

**Exploratory Factor Analysis**

The 19 SCERES item scores from Sample 1 were submitted to principal component analysis with varimax rotation. The eigenvalue > 1 rule, scree test, parallel analysis, and the interpretability of different factor solutions served as the criteria to determine the number of factors to extract. All extraction methods supported a four-factor final solution, with the four factors cumulatively accounting for 60.39% of the total variance. Four items cross-loaded on more than one factor and had low factor loadings. Based on the recommended factor loading of ±.30 as minimum level for interpretability (Hair, Black, Babin, Anderson, & Tatham, 2006), these four items were eliminated. They were one item assessing efficacy in regulating shame, “How well can you manage shame when you do not reach your expectation?” two items of efficacy in regulating guilt, “How well can you contain feelings of guilt after neglecting the people you care about during times when they need you the most?” “How well can you regulate guilt when you unconsciously hurt those who are important to you?” and one item from the domain of efficacy in regulating pride, “How well can you feel pride in your achievements?”

Table 1 shows the results of EFA with the retained factors and the loadings of 15 items. The first factor consists of five items explaining 20.83% of the total variance. The second and third factors consist of three items each, explaining 13.81% and 13.13% of the total variance, respectively. The fourth factor consists of four items explaining 12.62% of the total variance. According to the items clustering around each factor, factors 1 to 4 were designated self-efficacy in managing shame/embarrassment (SE_SE), guilt (SE_G), envy (SE_E), and pride (SE_P), respectively.

**Confirmatory Factor Analysis**

To further validate the factor structure of the SCERES identified by EFA, several CFAs were performed on the 15 SCERES items using data from Sample 2. Three alternative theoretical models were estimated separately: (a) a two-factor model consisting of the capability to manage negative and express positive emotions as separate factors; (b) a four-factor model assuming that the four correlated latent factors identified by EFA underlie the 15 SCERES items; and (c) a second-order model in which SE_SE, SE_G, and SE_E loaded on a higher-order factor (self-efficacy in managing negative emotions), with SE_P serving as a separate factor (self-efficacy in managing positive emotions). These two

---

**Table 1. Factor Loadings for Exploratory Factor Analysis.**

| Item content                                                                 | SE_SE | SE_G | SE_E | SE_P |
|-----------------------------------------------------------------------------|-------|------|------|------|
| How well can you . . .                                                       |       |      |      |      |
| SE_SE                                                                       |       |      |      |      |
| 1. deal with embarrassment after realizing you’ve made a silly comment during a conversation with your professors or work colleagues?# | .497  | .212 | .104 | .110 |
| 2. contain your shame after having made a fool of yourself in front of many people?# | .780  | -.061| -.007| -.063|
| 3. overcome shame when your weaknesses become evident in front of others?#   | .660  | .079 | .159 | .023 |
| 4. contain embarrassment when you become the attentional spotlight?          | .622  | .145 | -.069| .059 |
| 5. avoid embarrassment when being laughed at?                                | .693  | -.004| .109 | -.094|
| SE_G                                                                        |       |      |      |      |
| 6. control feelings of guilt after not fulfilling important commitments and obligations?# | .169  | .658 | -.165| .032 |
| 7. contain feelings of guilt after having violated very important personal moral principles?# | -.035 | .755 | .058 | -.156|
| 8. control feelings of guilt when your own faults bring negative effects to your group? | .163  | .483 | .006 | -.034|
| SE_E                                                                        |       |      |      |      |
| 9. control envy when people with equal or lesser competence get ahead you?   | .200  | .010 | .525 | -.047|
| 10. contain envy when people around you get what you are yearning for?       | .016  | -.030| .675 | -.024|
| 11. control envy when you feel unable to have the advantage that others have!| .026  | .024 | .713 | .101 |
| SE_P                                                                        |       |      |      |      |
| 12. express pride when others praise the good things you have done?          | -.046 | .094 | .143 | .536 |
| 13. feel pride when your group makes achievements?                          | -.047 | .053 | .071 | .518 |
| 14. feel pride when people close to you achieve success?                    | .029  | -.054| .189 | .360 |
| 15. express pride when your successes bring benefits to your group members? | .286  | -.054| -.083| .671 |
| Explained variance                                                          | 20.83% | 13.81% | 13.13% | 12.62% |

Note. SE_SE = self-efficacy in managing shame/embarrassment; SE_G = self-efficacy in managing guilt; SE_E = self-efficacy in managing envy; SE_P = self-efficacy in managing pride. Bold-faced values in the same column indicate the corresponding items belong to the same factor.

#Derived from the Multidimensional Negative Emotions Self-Regulatory Efficacy Scale (MNESRES; Caprara, Giunta, Pastorelli, & Eisenberg, 2013).
Table 2. Goodness-of-Fit Indices and Comparison of the Tested Models.

| Model           | $\chi^2$ | df | RMSEA [95% CI] | CFI   | TLI   | SRMR  |
|-----------------|----------|----|----------------|-------|-------|-------|
| Two-factor      | 288.96   | 89 | .083 [.073, .094] | .807  | .772  | .074  |
| Four-factor     | 134.26   | 84 | .043 [.029, .056]$^*$ | .951  | .939  | .048  |
| Second-order    | 140.70   | 86 | .044 [.031, .057]   | .947  | .935  | .053  |

Note. df = degree of freedom; RMSEA = root mean square error of approximation; CI = confidence interval; CFI = comparative fit index; TLI = Tucker–Lewis index; SRMR = standardized root mean square residual.

Table 3. Correlations Between SCERES and Rosenberg Self-Esteem Scores.

|       | 1  | 2  | 3  | 4  | 5  | 6  |
|-------|----|----|----|----|----|----|
| SE_SE | 1  |    |    |    |    |    |
| SE_G  | 0.454$^{**}$ | 1  |    |    |    |    |
| SE_E  | 0.484$^{**}$ | 0.348$^{**}$ | 1  |    |    |    |
| SE_P  | 0.342$^{**}$ | 0.119$^{*}$ | 0.284$^{**}$ | 1  |    |    |
| SCERES| 0.844$^{**}$ | 0.664$^{**}$ | 0.709$^{**}$ | 0.613$^{**}$ | 1  |    |
| Self-Esteem | 0.462$^{**}$ | 0.197$^{*}$ | 0.299$^{*}$ | 0.411$^{***}$ | 0.494$^{**}$ | 1  |

Note: SCERES = self-conscious emotion regulatory efficacy scale; SE_SE = self-efficacy in managing shame/embarrassment; SE_G = self-efficacy in managing guilt; SE_E = self-efficacy in managing envy; SE_P = self-efficacy in managing pride.

Factors were expected to be correlated, according to previous findings (Bandura et al., 2003; Caprara et al., 2010; Caprara & Steca, 2005).

Table 2 summarizes the fit indices of three competing models, determined using robust maximum likelihood (MLR) estimation. The four-factor model showed the best fit, with excellent goodness-of-fit indexes (CFI > .95, TLI > .93, RMSEA < .04). The two-factor model fit the data poorly (CFI < .90, TLI < .90, RMSEA > .08). The second-order model fit the data well (CFI > .90, TLI > .90, RMSEA < .08), but more poorly than the four-factor model. In addition, the four-factor model was more parsimonious than the second-order model. We thus accepted the four-factor model as the best model.

Reliability

Composite reliability values for the SE_SE, SE_G, SE_E, and SE_P subscales were .796, .744, .700, and .751, respectively. Test–retest reliability values for these subscales were .427, .367, .377, and .380, respectively.

Construct Validity

Correlations among SCERES subscale scores were low to moderate [.119, .484] (Table 3). Correlations of SCERES subscale scores with total SCERES scores were moderate to high [.613, .844]. Moreover, correlations between SCERES factors and self-esteem scores were in the expected direction (i.e., higher self-efficacy beliefs were significantly related to higher self-esteem; Table 3).

Discussion and Conclusion

The primary purposes of this study were to develop and examine the psychometric properties of the SCERES. EFA results for data from Sample 1 revealed that the 15 SCERES items can be interpreted in terms of four dimensions (SE_SE, SE_G, SE_E, and SE_P). To validate the structure of the SCERES based on the EFA of data from Sample 1, we specified and estimated three alternative models. The results supported the four-factor model with 15 items. These findings imply that self-conscious emotion regulatory efficacy has a multidimensional first-order factor structure, partly consistent with previous studies assuming that regulatory emotional efficacy has a multidimensional higher-order structure (Caprara et al., 2008; Caprara, Giunta, et al., 2013).

The results of composite and test–retest reliability assessment showed that the SCERES is stable and consistent. The subscales showed acceptable, but not high, test–retest reliability. The 3-month retesting interval may have been sufficiently long to allow for changes in participants’ perceived self-efficacy. Overall, all of these indicated the stability and reliability of the SCERES.

The construct validity of the SCERES was supported by low to moderate correlations among the four dimensions of the SCERES and the high level of correlation between the total scale and subscales (John & Benet-Martinez, 2000). Furthermore, significant positive Pearson correlation coefficients of self-conscious emotion regulatory efficacy and self-esteem indicated well the construct validity of the SCERES.

This study had several limitations. First, the SCERES does not assess all types of self-conscious affect. Rather, it contains items pertaining to a restricted number of self-conscious emotions. Researchers could further explore the multidimensionality of the capability to manage other self-conscious emotions. Second, all participants were university students; thus, the validity of the SCERES in other groups requires further examination.

In the present study, we developed and validated a scale that can effectively measure self-conscious emotion regulatory efficacy with regard to several psychometric properties. Thus, the SCERES should be considered a reasonably useful instrument, particularly for application in a Chinese cultural context.
Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: This research was funded in part by grants from the National Natural Science Foundation of China (31400909), the Research Award Fund for Outstanding Young Teachers in Higher Education Institutions of Guangdong Province, China (Yq2013068), the Philosophy and Social Sciences Planning Project of Guangdong Province, China (GD13CGL13), the Project of Department of Education of Guangdong Province, China (2013KJCX0073, 2015WTSCX019), and Research project of Guangdong University of Finance & Economics (08BS18001).

References

Alessandri, G., Caprara, G. V., Eisenberg, N., & Steca, P. (2009). Reciprocal relations among self-efficacy beliefs and prosociality across time. Journal of Personality, 77, 1229-1259.

Bandura, A., Caprara, G. V., Barbaranelli, C., Gerbino, M., & Pastorelli, C. (2003). Role of affective self-regulatory efficacy in diverse spheres of psychosocial functioning. Child Development, 74, 769-782.

Blanchard-Fields, F., & Coats, A. H. (2008). The experience of anger and sadness in everyday problems impacts age differences in emotion regulation. Developmental Psychology, 44, 1547-1556.

Caprara, G. V., & Gerbino, M. (2001). Affective perceived self-efficacy: The capacity to regulate negative affect and to express positive affect. In G. V. Caprara (Ed.), Self-efficacy assessment (pp. 35-50). Trento, Italy: Edizioni Erickson.

Caprara, G. V., Gerbino, M., Paciello, M., Di Giunta, L. M., & Pastorelli, C. (2010). Counteracting depression and delinquency in late adolescence: The role of regulatory emotional and interpersonal self-efficacy beliefs. European Psychologist, 15, 34-48.

Caprara, G. V., Giunta, L. D., Eisenberg, N., Gerbino, M., Pastorelli, C., & Tramontano, C. (2008). Assessing regulatory emotional self-efficacy in three countries. Psychological Assessment, 20, 227-237.

Caprara, G. V., Giunta, L. D., Pastorelli, C., & Eisenberg, N. (2013). Mastery of negative affect: A hierarchical model of emotional self-efficacy beliefs. Psychological Assessment, 25, 105-116.

Caprara, G. V., & Steca, P. (2005). Affective and social self-regulatory efficacy beliefs as determinants of positive thinking and happiness. European Psychologist, 10, 275-286.

Caprara, G. V., Vecchione, M., Barbaranelli, C., & Alessandri, G. (2013). Emotional stability and affective self-regulatory efficacy beliefs: Proofs of integration between trait theory and social cognitive theory. European Journal of Personality, 27, 145-154.

Dou, K., Nie, Y. G., Wang, Y. J., & Li, J. (2012). Relations of adolescents’ emotional regulation self-efficacy and mental health. Chinese Journal of School Health, 33, 1195-1197.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E., & Tatham, R. L. (2006). Multivariate data analysis (6th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

Izard, C. E. (2007). Basic emotions, natural kinds, emotion schemes, and a new paradigm. Perspectives on Psychological Science, 2, 260-280.

Izard, C. E. (2011). Forms and functions of emotions: Matters of emotion-cognition interactions. Emotion Review, 3, 371-378.

John, O. P., & Benet-Martínez, V. (2000). Measurement, scale construction, and reliability. In H. T. Reis & C. M. Judd (Eds.), Handbook of research methods in social and personality psychology (pp. 339-369). New York, NY: Cambridge University Press.

Kline, R. B. (2010). Principles and practice of structural equation modeling (3rd ed.). New York, NY: Guilford Press.

Raykov, T. (1997). Estimation of composite reliability for congeneric measures. Applied Psychological Measurement, 21, 173-184.

Smith, R. H., & Kim, S. H. (2007). Comprehending envy. Psychological Bulletin, 133, 46-64.

Tangney, J. P., Wagner, P., & Gramzow, R. (1992). Proneness to shame, proneness to guilt, and psychopathology. Journal of Abnormal Psychology, 101, 469-478.

Tracy, J. L., & Robins, R. W. (2004). Putting the self into self-conscious emotions: A theoretical model. Psychological Inquiry, 15, 103-125.

Author Biographies

Yan Wu, PhD, is an associate professor in the Department of Applied Psychology, Guangdong University of Foreign Studies. Her research interests include psychometrics, psychological statistics, and adolescent development.

Qimin Liang is a postgraduate student in the Division of Social Science, the Hong Kong University of Science and Technology. Her research interests include psychometrics, emotional regulation, and adolescent development.

Bi Li, PhD, is a professor in the School of Informatics, Guangdong University of Foreign Studies. His research focuses on psychometrics, statistics and artificial intelligence.