

## **An Investigation on the Factor Structure of Schutte Self Report Emotional Intelligence Test in Indian Student Sample**

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### **ABSTRACT**

Schutte et. al., (1998) developed and validated a measure of emotional intelligence called as SSEIT. From a pool of 62 items, Schutte et. al., (1998) extracted 33 items which were proposed to be homogenous in nature. In simple words, uni-dimensionality has been identified in Schutte et. al., (1998)'s work. This study attempts to find the factor structure of SSEIT in the Indian sample. Using exploratory factor analysis, a four factor structure model of SSEIT is reported. A four factor model has been hypothesized, which is tested using confirmatory factor analysis. The model is found to be fit with the necessary indices falling within the acceptable limits.

**Keywords:** *Emotional intelligence, SSEIT, Exploratory factor analysis, Confirmatory factor analysis.*

Mayer and Salovey (1997) have defined emotional intelligence as “the ability to perceive emotions, to access and generate emotions so as to assist thought, to understand emotions and emotional knowledge, and to reflectively regulate emotions so as to promote emotional and intellectual growth”, which acted as a base for the revised four factor model of the. The four factor model of emotional intelligence views emotional intelligence based on the four factors namely emotional perception, emotional facilitation, emotional knowledge and emotional growth. This four factor model emphasizes more on cognition. As the concept of emotional intelligence has been conceptualized in different ways, it has resulted in confusion on the conceptualization and the measurements (Roberts, Zeidner and Mathews (2001); Bastian, Burn and Nettelbuck, 2005). The emerging empirical evidences have not kept place with these theoretical propositions, it has lead to claims that majority of emotional intelligence studies are carried out in theoretical vacuum (Perez, Petrides and Furnham, 2005).

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### ***SSEIT***

Based on the three factor model of Salovey and Mayer (1990), Schutte et.al. (1998) have designed the Self Report Emotional Intelligence scale called Schutte Self Report Emotional Intelligence scale (SSEIT). Schutte et al (1998) generated a pool of 62 items based on the Salovey and Mayer (1990)'s theoretical three factor model of emotional intelligence. These 62 items were administered to 346 participants of United States in a five point scale where '1' represented 'strongly disagree' and '5' represented 'strongly agree'. From the responses collected, out of the 62 items 33 items loaded on a single factor with loadings 0.4 and above. Hence they designed the scale with 33 items out of which 3 items are reverse scored. The test – retest reliability (0.78), internal consistency (Cronbach's alpha 0.87) predictive validity (predicted grade point average in school students  $r = 0.32$ ,  $p < 0.01$ ), and discriminant validity (with Big Five personality traits) of the scale has been checked by them and reported to be stable and acceptable.

This is one of the few inventories that is available for the public. SSEIT gives some advantages on scoring, reliability, and emphasis on typical performance when compared to other measures of EI (Gignac et al, 2005). SSEIT is also widely used in research across countries (Naeem and Muijtjens, 2015; Tharbe, Mun and Sumari, 2015). But SSEIT has got certain shortcomings as Schutte et.al., (1998) have used the principal component orthogonal – rotation factor analysis in extracting the 33 items which had 0.4 and above loadings. Hence by using an exploratory analysis alone they concluded the factor structure of the 33 items as uni-dimensional which represented the three sub factors of emotional intelligence namely recognition of emotions, regulation of emotions and utilization of emotion. They also argued that as roughly equal number of items on the three factors of emotional intelligence could be evolved after the factor analysis, emotional intelligence could be considered as homogeneous in nature. They also argued on the conceptual parsimony of the one factor generated with 33 items. But all the 62 items with which they started their analysis and their argument of three factor model of emotional intelligence stresses on the three distinct factors which makes emotional intelligence as a latent construct. They concluded the one factor solution for SSREI which resulted in three different sub categories. In case the three different categories are as they have not also confirmed the factor structure of SSEIT by Confirmatory Factor Analysis (CFA), further analysis on the factor structure of SSEIT has been guaranteed.

### ***Factor Structure of SSEIT***

Item level factor structure of the SSEIT has been attempted by many researchers and the results vary. Even some contradictory results have been reported. The results include a uni-dimensional structure (Schutte et.al., 1998), three dimensional structure (Naeem and Muijtjens, 2015) four dimensional structure ( Petrides and Furnham 2000, Saklofske, Austin and Minski 2003), five dimensional structure converging into a single construct of emotional intelligence (Ng et al.,

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2010, Gong and Paulson, 2016), and six dimensional structure which was further reduced to four dimensions(Gignac et al 2005). Saklofske, Austin and Minski(2003)'s study results corroborated closely with the factor solution obtained by Petrides and Furnham.

### ***The present study***

Though majority of the studies have reported four factor structure, the factor items remain to be different. Hence the convergence of items on the four factor structure could always be analyzed and this study attempts it. The minimal usage of CFA on the factor structure has also guaranteed further studies on this area. Hence this study tries to evolve the factor structure using Exploratory Factor analysis (EFA) and further tries to confirm the factor structure using CFA in the Indian context.

## **METHOD**

### ***Respondents***

The study was conducted among 860 students across various educational institutes in India. The educational institute has been chosen randomly. In total, 599 males and 231 females participated in this study. The mean age of the participants is 21.02 years.

### ***Tool***

The study used the self report questionnaire of Schutte et.al., (1998) which has 33 items with three negative items (5, 28, and 33) that has to be reverse scored. The responses are indicated on a Likert scale.

## **RESULTS**

### ***Exploratory Factor Analysis***

The exploratory factor analysis resulted in a four factor structure with 58% of the total variance ( Table I). Only the factor loadings above 0.4 have been extracted (Schutte et.al., 1998). Out of the 33 items, items 4, 5, 12, 21, 31 could not load on any of the four factors extracted. Though the study by Petrides and Furnham (2000) reported for all item loading in a four factor structure, in this study the four factors extracted with the deletion of five items more or less corroborated with their factors, hence the same names of the factors has been followed in this study also. The four identified factors are Appraisal of Emotions, Social Skills, Emotion Utilization and Optimism / Mood Regulation.

When tested for the uni-dimensional structure for the model, it could account only for 24% of total variance. Hence the four factor extracted from exploratory factor analysis has been taken for further confirmation.

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### *Confirmatory Factor Analysis*

Confirmatory Factor Analysis (CFA) allows a researcher to test the relationship between the observed variable and their underlying latent constructs. In this study, the uni-dimensional and the four factor structure as extracted by the exploratory factor analysis have been tested to check the suitability of the structure of SSEIT in the Indian context.

CFA was done with the 28 items to test the uni-factor structure of SSEIT, using AMOS 7.0. The cut offs for accepting a model for Tucker-Lewis Index (TLI), Non-Normed Fit Index (NNFI), Goodness of Fit Index (GFI), Adjusted Goodness of Fit Index (AGFI), and Comparative Fit Index (CFI) is greater than or equal to 0.9 (Byrne 1989, Hu and Bentler, 1995), Root Mean Squared Error of Approximation (RMSEA) is less than or equal to 0.05 and Root mean Residual (RMR) is less than or equal to 0.06. Some authors have suggested that the value of RMSEA can be taken for consideration till 0.8 (Browne and Cudeck, 1993). The cut off for the ratio of the chi-square to its corresponding degrees of freedom is between 1 and 5 (Bollen, 1989).

The fit indices for the various dimensionalities of SSEIT are given in table II.

From table II, it is inferred that the fit indices for the uni-dimensional structure of Schutte et.al., (1998), TLI of 0.64 is far below 0.9, CFI (0.67) is less than the acceptable limit of 0.9, and NNFI (0.60) is also less than the acceptable limit of 0.9. As far as the absolute fit indices are concerned RMSEA (0.06) is greater than the acceptable limit of 0.05. RMR (0.06) of uni-dimensional structure of Schutte et.al., (1998) is approximately equal to 0.06 which is not an acceptable limit. Hence the uni-dimensional structure of Schutte et.al., (1998) has reported most fit indices which are wide of their respective recommended values there by indicating a lack of fit for uni-dimensionality.

The four dimensional structure proposed in this study produced a  $\chi^2/df$  (3.54) which is below the threshold of 5, hence it falls in the acceptable limit. The absolute fit indices indicate a good model fit as RMR (0.05) and RMSEA (0.58) also reported to fall within acceptable limits. The incremental fit indices also indicate a good model fit as CFI (0.93), TLI (0.91), and NNFI (0.89) are within the acceptable limits.

From table II it could be inferred that the hypothesized model has shown a good fit as all the indices considered are within the acceptable limits.

## **DISCUSSION**

Hence in this study a uni-dimensional structure as suggested by Schutte et.al., (1998) who had developed SSEIT could not be recovered. A four factor model of emotional intelligence that has been identified in this study is in conjunction with the models of Saklofske, Minski, and Austin

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(2003) and Petrides and Furnham (2000). This hypothesized model has been proved to be superior when compared to the uni-dimensional structure. While there are little differences in the item structure when compared to other similar studies, this study has added support for the robust usage of SSEIT across the cultural settings with differing factor structure. As the number of items on the four factors is also more or less the same, revision of SSEIT based on the retrieved four factor model can be made.

Though the hypothesized model has been tested using CFA, cross validation on the results across other populations could be made. Also the study has not attempted to test the other reliability and validity tests like test-retest reliability, predictive and discriminant validities in the taken population. The five items which has not been loaded above 0.4 can be taken into account for any modification of the present SSEIT scale. The SSEIT scale is also imbalanced on the number of positive items (which are 30 in numbers) and negative items (which are only 3 in numbers), which can also act as a basis for modification of the scale. The study has attempted to test only the factor structure underlying SSEIT and not the suitability of the scale in the Indian population. The study has also used SSEIT in English, but not in the native language of the respondents. Further study can be done using SSEIT with other tools of emotional intelligence and the suitability of the scale can be tested. The other personality tools can also be used to report validity of SSEIT vis - a-vis the personality factors.

A detailed study with a greater sample can be attempted to have a better understanding of the factor structure of SSEIT. Though the sample size of this study is limited, the sample is not from a unique educational institute in India which is a major advantage of this study. Another limitation of this study is the non- accountability of the first order and second order factors, which can also be attempted in further studies. Although there are some limitations in this study, the study could through insights in the factor structure of SSEIT in the Indian sample, which has not been attempted before.

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### ***Conflict of Interests***

The author declared no conflict of interests.

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**Table I Results of Factor Analysis**

	<b>Appraisal of Emotions</b>	<b>Social Skills</b>	<b>Emotion Utilization</b>	<b>Optimism</b>
1		.76		
2				.61
3				.48
4				
5				
6			.48	
7			.54	
8		.77		
9	.57			
10				.50
11		0.73		
12				
13		.48		
14				.44
15	.63			
16		.74		
17			.54	
18	.62			
19	.77			

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	<b>Appraisal of Emotions</b>	<b>Social Skills</b>	<b>Emotion Utilization</b>	<b>Optimism</b>
20			.62	
21				
22	.71			
23				.50
24		.55		
25	.66			
26		.63		
27			.52	
28				.56
29	.74			
30		.51		
31				
32	.72			
33				

*Note: Factor loadings greater than 0.4 are shown. Items in SSEIT are given in the same order by item numbers.*

**Table II, Indices for Tested Models**

<b>Structure of SSEIT</b>	<b>TLI</b>	<b>CFI</b>	<b>NNFI</b>	<b>RMSEA</b>	<b>RMR</b>	<b>GFI</b>	<b><math>\chi^2</math> /df</b>	<b>AGFI</b>
Uni-Dimensionality of Schutte et.al., (1998)	0.64	0.67	0.60	0.06	0.06	0.73	4.32	0.72
Four Factor Hypothesized Model	0.91	0.93	0.89	0.04	0.04	0.96	2.37	0.95

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