International Comparative Analysis of the Schutte Self-Report Emotional Intelligence Scale

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Abstract

Measurement of emotional intelligence has proved to be problematic in terms of sample, measurement, and conceptual issues. The current study refines the sample to clearly identified countries of the United States, Brazil, and India. Country identification will facilitate an examination of cultural differences in the Schutte Self-Report Emotional Intelligence Scale (SSREI) factor structure. The SSREI became one of the few instruments measuring EI that were in the public domain (Tett et al., 2005). Further studies indicated structural problems with the SSREI (Austin et al., 2004; Gignac et al., 2005; Petrides & Furnham, 2000; and Saklofske et al., 2003). Researchers stressed the need to test the instrument on a wider range of populations. Data collected through a collaborative research project with Baldwin Wallace University, FAE Business School in Curitiba, Brazil and Christ University in Bangalore, India are used to compare the U.S., Brazil, and India responses to the Schutte Self-Report Emotional Intelligence Scale (SSREI). Data was collected from 646 MBA students across the three countries. Results show that dimensions of the SSREI do not translate well across cultures, but the unidimensional scale may be appropriate across cultures.

Keywords: emotional intelligence, cultural comparison, international

1. Introduction

This study builds on the comparative study by Ng, Wang, Kim, and Bodenhorn (2010) that examined the Schutte Self-Report Emotional Intelligence Scale (SSREI) using a sample of international students studying in the United States.   Ng et al. (2010: p.695) found that the posited model for the scale was not parsimonious. Use of the SSREI is widely supported in the literature based on its length and availability in the public domain (p.697). Studies investigating the SSREI's structure have been conducted using different populations (Austin, Saklofske, Huang, & McKenny, 2004; Gignac, Palmer, Manocha, & Stough, 2005; Petrides & Furnham, 2000) showing issues with the scale, resulting in calls for further investigation of the instrument.

2. Literature Review

2.1 Emotional Intelligence

Emotional Intelligence (EI), a term coined by Salovey and Mayer (1990) has been claimed to be a powerful predictor of success in life (Goleman, 1995), the performance of organizational members (Caruso & Salovey, 2004), ethical behavior (Deshpande & Joseph, 2009), and organizational climate (Momeni, 2009). Mayer and Salovey (1997) define EI as a set of abilities that enable an individual to perceive emotion in themselves and others, to use emotions to facilitate performance, to understand emotion in others, and to regulate emotion in themselves. The construct has seen much interest in the popular press and in management education. Organizations have integrated emotional intelligence development, and educational institutions have incorporated the concept in curriculum based on the linkage between EI and performance (Ciarrochi & Mayer, 2013; Druskat, Mount, & Sala, 2013).

Empirical research demonstrating the relationship between EI and organizational performance is mixed. Positive relationships between EI and specific undergraduate tasks (Lam & Kirby, 2002), sales performance (Wong, Law,

& Wong, 2004), and supervisory rating of job performance (Law, Wong & Song, 2004; Slaski & Cartwright, 2002) have been identified. However, conflicting research results show no significant relationship between EI and performance (Austin, 2004; Day & Carroll, 2004), between EI and academic performance (Petrides, Frederickson, & Furnham, 2004), or between EI and supervisory ratings of employee performance (Janovics & Christiansen, 2001). Evidence supporting the relationship between EI and success is largely anecdotal with some researchers calling the claimed relationships as "ill-defined, unsupported, and implausible" (Cote & Miners, 2006, p.15). In a meta-analytic investigation, O'Boyle, Humphrey, Pollack, Hawver, and Story (2011) found the relationship between emotional intelligence and job performance had an effect size of .07 when controlling for additional individual difference factors in a multiple regression. These conflicting results indicate both construct and measurement issues.

2.2 Cultural Differences in Emotional Intelligence

The core question of this research is 'Does emotional intelligence translate across culture?'. This research replicated the Ng et al. (2010) study that used an international population of students studying in the U.S. Ng et al. (2010) hypothesized that international, i.e., Asian and U.S. cultures would be homogeneous regarding the individual's beliefs and perceptions of emotional intelligence. This assumption is problematic. As an individual characteristic, emotional intelligence is subjected to national culture and thus combining multiple international cultures for analysis purposes does not provide an adequate evaluation due to significant culture differences. Culture is defined as the "collective programming of the mind…" (Hofstede, 1980; p.25).   Culture provides individuals with a system to transfer meaning and information to members (Matsumoto, Yoo, & Nakagawa, 2008). Emotional competencies are viewed as the individual characteristics acquired during socialization (Sharma, 2012). Studies have shown that cultures vary in specific value manifestation that includes the response style of individuals to an instrument, with more collective cultures being more likely to choose mid-point values (Chen, Lee & Stevenson, 1995). Differences in the level of emotional expressiveness by culture are noted by Hammer (2005) with Western cultures tending to be more overtly expressive of emotions and Asian cultures being more reserved and tending to minimize emotional display (Ting-Toomey, 1999). In addition, Ang, Van Dyne, Koh, Ng, Templer, Tay, and Chandrasekar, (2007) proposed that an individual with a high level of emotional intelligence in one culture might be considered having a low level of emotional intelligence in another culture. Cultural beliefs are found to impact emotions, perceptions and cognitive schema (Taras, Kirkman, & Steel, 2010). Collectivism, uncertainty avoidance, and long-term orientation have been found to have a positive influence on dimensions of emotional intelligence (Gunkel, Schlagel, & Engle, 2014).

2.3 EI measurement Issues

The SSREI, developed by Schutte, Malouff, Hall, Haggerty, Cooper, and Golden in 1998 is based on the Salovey and Mayers (1990) model of emotional intelligence. The Salovey and Mayer (1990) model incorporated three dimensions of the construct: appraisal and expression of emotions, regulation of emotions, and utilization of emotions in solving problems. Schutte et al. (1998) determined that the Salovey and Mayer model with three dimensions was not conceptually distinct and concluded that all 33 items of the scale are a unidimensional indicator of trait EI. The original SSREI reported an alpha coefficient of .87, a test-retest reliability of .78, and demonstrated discriminant validity (Schutte el al., 1998). The SSREI became one of the few instruments measuring EI that were in the public domain (Tett et al., 2005). Further studies indicated structural problems with the SSREI (Austin et al., 2004; Gignac et al., 2005; Petrides & Furnham, 2000; and Saklofske et al., 2003). Researchers stressed the need to test the instrument on a wider range of populations.

2.4 Previous Studies

Ng et al. (2010) used five studies to compare the factor structure of the SSREI. Petrides and Furnham (2000) conducted research in Britain with a sample of 260 students. Findings conclude that a four-factor solution to the instrument best represented the construct. Likewise, Chan (2003) also supported a four-factor solution. One criticism of the SSREI was the absence of reverse-coded items. Austin et al. (2004) added reverse coded items, but found a three-factor solution, with factor loadings that were inconsistent with previous research. Hakanen (2004) used principal component factor analysis, but could not replicate the Petrides and Furnham (2000) factor structure. Arguing that since the factors of SSREI should be correlated, Gignac et al. (2005) used oblique rotation in the analysis, arrived at a four-factor solution, but reduced the items from 33 to 28, then to 21. Ng et al. (2010) used the Gignac et al. (2005) 21-item scale and found acceptable model fit with four factors: emotional regulation of the self, appraisal of emotions in others, appraisal of emotions in the self, utilization of emotions in problem-solving, and a reverse score dimension. The sample used by Ng et al. (2010) was 640 international student studying in the United States. Students identified as coming from Asian, Africa, Europe, and Central and

South America.

These inconsistent results are problematic and are indicative of sample, measurement and conceptual issues. The samples used among these studies varies from being country specific as in Britain (Petrides & Furnham, 2000), Hong Kong (Chan (2003), the United States, to a global mixed sample (Ng el al. (2010). The current study refines the sample to clearly identified countries of the United States, Brazil, and India. Country identification will facilitate an examination of cultural differences in the SSREI factor structure.

3. Method

3.1 Participants

MBA students at three universities participated in the survey as part of their academic program. There were 246 participants, with 239 complete surveys from Baldwin Wallace University in Cleveland, Ohio; 105 males, 134 females with an average age of 35.59. From the FAE Business School in Curitiba, Brazil there were 220 participants, with 216 complete surveys; 87 males, 129 females with an average age of 30. From Christ University in Bangalore, India there were 199 participants, with 191 complete surveys; 90 males, 101 female with an average age of 22.47. All 654 participants took the 33-item paper-and-pencil SSREI instrument. Table 1 shows the participant gender and average age.

Table 1. Participant gender and average age by Country

	United States	Brazil	India	Total
Male	105	87	90	282
Female	134	129	101	364
Total	239	216	191	646
Average age	35.59	30	22.47	

4. Results

The analysis covered three phases; exploratory factor analysis, confirmatory factor analysis using structural equation modeling, and examination of internal consistency of the factors.

4.1 Exploratory Factor Analysis

The first step in the analysis was to examine the factor structure of the instrument. This step in the analysis is warranted since previous studies show inconsistency in factor structure. Using the Ng et al. (2010) reduced item set, 21 items were used in the Promax rotation. Table 2 shows the factor structure. Dual loading and low loading is noted for items 3, r5, 18, 22, r33, and 19 (r = reverse coded item). Further reduction of items resulted in the final set of 15 items and three factors. Table 3 shows the factor loadings of the 15-item set. Factor 1 represents Appraisal of Emotions. Items 2, 3 and 28r were eliminated due to dual loadings. Factor 2 represents Emotional Regulation. Item 33r is the only item eliminated from this factor. Factor 3 represents Utilization of Emotions and maintains the Ng et al. (2010) items.

Table 2. SSREI factor analysis using 21 items

| | Factor | | | |
	1	2	3	4
EI3		0.232	0.253	0.316
rEI5	0.416		-0.262	0.405
EI7			0.439	
EI10		0.602		
EI12		0.578		
EI14		0.527		
EI15	0.586	0.203		
EI17			0.452	
EI18	0.642		0.322	
EI20		0.211	0.539	
EI22	0.397	0.369		
EI23		0.530		
EI25	0.733			
EI27			0.342	
rEI28				0.724
EI29	0.605		0.245	
EI31		0.485		
EI32	0.559		0.245	
rEI33	0.217			0.534
EI9	0.326	0.316		

Notes. Extraction Method: Principal Axis Factoring; Rotation Method: Promax with Kaiser Normalization; a. Rotation converged in 8 iterations.

4.2 Confirmatory Factor Analysis

Confirmatory factor analysis was performed using the three-factor solution in Amos 20. Initially, the 21 item, four-factor structure was examined. The results of this model were poor. Next, the reduced item, a three-factor solution was examined. Results indicate that the reduced factor model fitted the data well. Table 3 shows the comparison of historic and current research results. The standardized regression weights are shown in Table 3 reveal differences by country. While all paths are significant, there are variations in paths. Based on the differences in standardized regression weights, internal consistency of each dimension by country was conducted.

Table 3. Reduced Factor Structure: 15 Items

| | Factor | | |
	1	2	3
rEI5	0.517		-0.287
EI7			0.495
EI10		0.618	
EI12		0.478	
EI14		0.520	
EI15	0.596		
EI17		0.232	0.464
EI18	0.593		0.310
EI20		0.204	0.626
EI23		0.546	
EI25	0.826		
EI27			0.404
EI29	0.496		0.285
EI31		0.538	
EI32	0.544		0.211

Notes. Extraction Method: Principal Axis Factoring; Rotation Method: Promax with Kaiser Normalization; a. Rotation converged in 8 iterations.

Table 4. Goodness-of-fit Indices of the data on international students to previous and current models

Models	X2	df	RMSEA	NFI	CFI
Schutte et al. (1998)	3952.68	495	.12	.84	.85
Petrides and Furnham (2000)	2945.51	458	.10	.88	.89
Chan (2003)	2227.51	371	.09	.87	.88
Austin, Saklofske, Huang, and McKenney (2004)	1212.03	249	.08	.88	.89
Hakanen (2004)	2527.77	458	.08	.86	.87
Gignac, Palmer, Manocha, and Stough (2005)	769.10	289	.05	.95	.96
Ng et al. (2010)	660.15	181	.06	.93	.94
Replicated All Factors	1941.75	732	.08	.74	.82
Current Model	590.27	261	.04	.79	.87
Reduced Factors					

Table 5. Standardized regression weights

Scale Item		Dimension	U.S. Estimate	Brazil Estimate	India Estimate
EI31_1	<---	Emotional_Regulation	.696	.550	.509
EI23_1	<---	Emotional_Regulation	.624	.518	.598
EI14_1	<---	Emotional_Regulation	.627	.430	.547
EI12_1	<---	Emotional_Regulation	.691	.510	.340
EI10_1	<---	Emotional_Regulation	.625	.648	.502
EI32_1	<---	Appraisal_Others	.647	.638	.742
EI29_1	<---	Appraisal_Others	.661	.862	.403
EI25_1	<---	Appraisal_Others	.824	.605	.589
EI18_1	<---	Appraisal_Others	.785	.840	.684
EI15_1	<---	Appraisal_Others	.590	.445	.437
rEI5_1	<---	Appraisal_Others	.467	.259	.174
EI20_1	<---	Using_Emotions	.744	.616	.716
EI27_1	<---	Using_Emotions	.415	.607	.393
EI17_1	<---	Using_Emotions	.669	.582	.692
EI7_1	<---	Using_Emotions	.468	.456	.318

Note. All weights are significant at the .001 level.

Table 6. US Model estimates
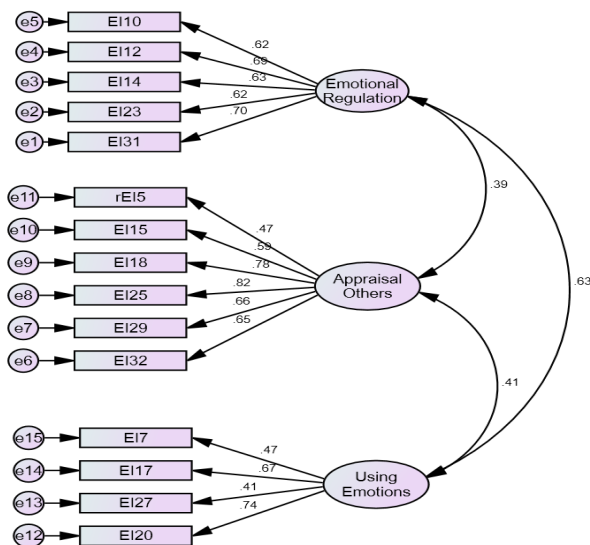
4.3 Internal Consistency

Internal consistency was examined by looking at each factor in total and by country. Table 7 reveals that there are issues with factor internal consistency when examined by country. The Emotional Regulation factor falls below .70 for Brazil and India. Appraisal of Emotions falls below .70 for Brazil. Utilizing Emotions performs below .70 for all three countries. This level of discrepancy among countries indicates that these factors may be unstable. However, when all 15 items are considered to be unidimensional, one factor, internal consistency is acceptable for all countries, with the U.S. at .83. Brazil reporting .78, India reporting .81, and for the sample total which was .80.

Table 7. Factor Mean, Correlation, and Reliability

Scale	Country	n	Mean	STD	ER	AO	UE
Emotional	US	246	3.80	.61	.79		
Regulation	BZ	220	4.02	.53	.65		
	IN	199	3.76	.51	.63		
Appraisal Others	US	246	3.76	.58	.33	.80	
	BZ	220	3.47	.64	.21	.66	
	IN	199	3.60	.53	.43	.79	
Using Emotions	US	246	3.81	.53		.47	.65
	BZ	220	3.82	.61		.29	.66
	IN	199	3.64	.59		.57	.60
Total	US	246	3.78				.83
	BZ	220	3.78				.78
	IN	199	3.70				.81
Total	All countries	665	3.76				.80

Note. Cronbach's Alpha for each of the countries is on the diagonal. All correlations are significant at the .001 level.

Based on the low levels of internal consistency, factor mean differences were analyzed by country. Table 7 shows that there are significant differences by country for each of the three factors of the SSREI by country. Table 8 provides more detail in comparing country mean values by factor with significant differences noted in Emotional Regulations between the U.S. and Brazil and between Brazil and India. All countries show significantly different mean values for Appraisal of Emotion. The U.S. and India, and Brazil and India differ in mean values for Utilization of Emotion. Mean value plots in Tables 10, 11 and 12 graphically show how the countries differ.

Table 8. Mean Differences by Country

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
Emotional Regulation	Between Groups	8.369	2	4.185	13.608	.000
	Within Groups	203.570	662	.308		
	Total	211.939	664			
Appraisal Others	Between Groups	9.755	2	4.877	14.076	.000
	Within Groups	229.386	662	.347		
	Total	239.140	664			
Using Emotions	Between Groups	4.158	2	2.079	6.284	.002
	Within Groups	219.005	662	.331		
	Total	223.162	664			

Table 9. Comparative mean differences by country

Dependent Variable	(I) Country	(J) Country	Mean Difference (I-J)	Std. Error	Sig.
Emotional Regulation	US	Brazil	-.22025*	.05146	.000
		India	.03607	.05287	.792
	Brazil	US	.22025*	.05146	.000
		India	.25632*	.05425	.000
	India	US	-.03607	.05287	.792
		Brazil	-.25632*	.05425	.000
Appraisal Others	US	Brazil	.28883*	.05462	.000
		India	.15822*	.05612	.019
	Brazil	US	-.28883*	.05462	.000
		India	-.13061	.05759	.077
	India	US	-.15822*	.05612	.019
		Brazil	.13061	.05759	.077
Using Emotions	US	Brazil	-.02219	.05337	.917
		India	.16100*	.05484	.014
	Brazil	US	.02219	.05337	.917
		India	.18320*	.05627	.005
	India	US	-.16100*	.05484	.014
		Brazil	-.18320*	.05627	.005

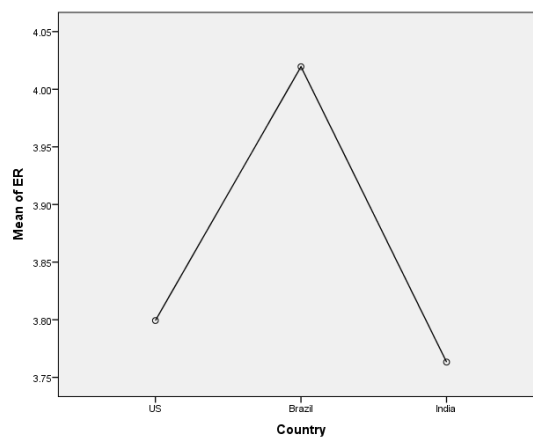Table 10. Plot of Emotional Regulation (ER) hofby Country
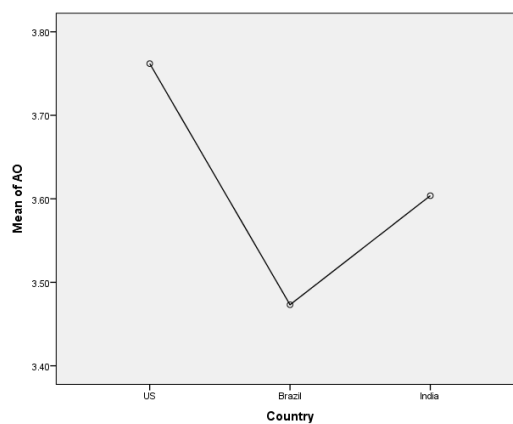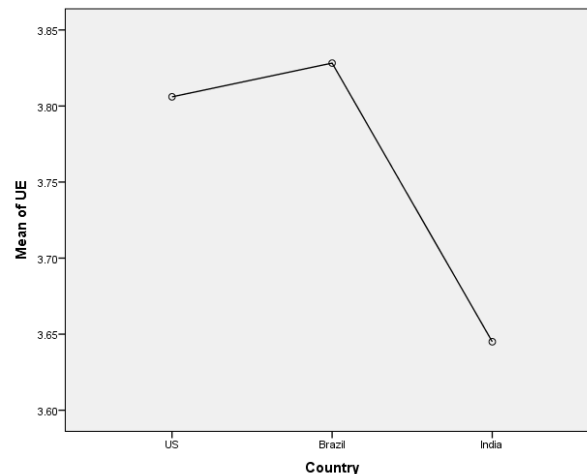

Table 11. Plot of Appraisal of Emotions (AO) by Country

Table 12. Plot of Utilization of Emotion (UE) by Country

5. Discussion

This study represents the first to investigate the structure of the SSREI in different, identified international populations. The original study, Ng et al. (2010) used a sample of international students studying in the U.S. with home country not identified. The Ng et al. (2010) sample was reported to be from 92 countries with participants grouped according to geographic regions.   The geographic grouping included African, Asian, European, Central and South American, North America, and Oceanic countries (p.701). This melding of international students into one sample population does not take into account country-specific cultural factors. The argument that students from China, Hong Kong, India and Indonesia fit the same 'Asian' cultural indicators is a broad generalization. The present study provides an in-depth look at the SSREI in three different MBA populations in the U.S., Brazil, and India. The data indicate that there are significant differences in the measurement of emotional intelligence by country.

The SSREI has been controversial in the definition of dimensions within the construct. The initial Schutte et al. (1998) research found a unidimensional factor, however, subsequent studies reported three to four factors within the construct (e.g., Petrides & Furnham, 2000; Saklofske et al., 2003; and Ng et al. 2010). The factors identified by Ng et al. (2010) include emotional regulation of self, appraisal of emotions in others, appraisal of emotions in self, and utilization of emotions in problem-solving. Using the Ng et al. (2010) 21-item analysis, the current study was unable to replicate the factor structure in total, nor by country-specific analysis. Using all 21 items in the exploratory factor analysis, item 3 shows triple loadings, items 22 and 19 show double loading, and the reversed scored items of 28 and 33 appear to load together due to the reverse scoring. The combined country data set shows that three factors emerge; emotional regulation, appraisal of emotion, and utilization of emotion. Therefore, the SSREI was pared down to 15 items that demonstrated appropriate factor loadings. Confirmatory factor analysis shows that the three-factor solution fitted the data reasonably well with a RMSEA of .04, a NFI of .79 and a CFI of .87. However, the standardized estimated paths show differences by country. All paths are significant, but the U.S. model indicates the strongest paths. Brazil and India show lower estimates for all items, except for items 17 and 32. For these two items, India shows a stronger path. Item 17 is 'When I am in a positive mood, solving problems is easy for me', and Item 32 is 'I can tell how people are feeling by listening to the tone of their voice'.

While the reduced item model fit the data reasonable well, additional investigation of the internal consistency of the factors shows that the factors may be unstable with reliability ranging from an acceptable .83 to a low of .63. Two factors have acceptable reliability in the U.S. population with emotional regulation at .79 and appraisal of emotion at .80. Utilization of emotion has a .65 reliability in the U.S. population. The factors in the Brazil and India data show reliability that is marginal. A comparison of the factor mean values by country reveals that all three factors are significantly different by country. The paired comparison provides more detail with emotional regulation and utilization of emotion mean values being similar in the U.S. and India, but both countries are significantly different from Brazil.

Based on the problematic reliability of the factors by country and the significant differences in mean values, this study supports a one-factor solution to the construct of emotional intelligence. The one-factor solution results in acceptable reliability at .80 when all countries are examined. The reliability for the revised SSREI in the U.S.

is .83, in Brazil is .78, and is .81 in India.

6. Limitations

A strength of this study is the diverse and large sample size, but limitations include common method variance, measurement issues of emotional intelligence, and cultural dynamics that may affect emotional intelligence. This study adds to the literature by using a large sample from three different counties. The sample includes individuals who are pursuing an MBA degree, therefore commonalities in the career phase and familiarity with organizational concepts among participants can be assumed. Data were collected through a single survey instrument at one point in time, which may lead to common method variance. The results of this study reinforce the measurement issue questions identified in previous research (Austin et al., 2004; Gignac et al., 2005; Petrides & Furnham, 2000; and Saklofske et al., 2003). This study found that a three-factor solution fits the data reasonably well, however, the internal consistency of the factors by country are a problem. Cultural dynamics within each country may affect the generalization of emotional intelligence across cultures. Emotional intelligence can vary from culture to culture in impact on behavior (Brackett & Geher, 2006; Wong, Wong, & Law, 2007). However, investigation of factorial invariance across cultural groups is not sufficient to demonstrate measurement quality (Bryne & Watkins, 2003). The revised instrument should be tested again along with other validity checks in the different countries.

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Appendix

SSREI Original Instrument - 33 Items

1. I know when to speak about my personal problems to others.

2. I remember times I faced difficult obstacles and overcame them.

3. I expect that I will do well on most things I try.

4. Other people find it easy to confide in me.

5. I find it hard to understand the non-verbal messages of other people.

6. Some of the major events of my life have led me to re-evaluate what is important and not important.

7. When my mood changes, I see new possibilities.

8. Emotions are one of the things that make my life worth living.

9. I am aware of my emotions as I experience them.

10. I expect good things to happen.

11. I like to share my emotions with others.

12. When I experience a positive emotion, I know how to make it last.

13. I arrange events others enjoy.

14. I seek out activities that make me happy.

15. I am aware of the non-verbal messages I send to others.

16. I present myself in a way that makes a good impression on others.

17. When I am in a positive mood, solving problems is easy for me.

18. By looking at people's facial expressions, I recognize the emotions.

19. I know why my emotions change.

20. When I am in a positive mood, I am able to come up with new ideas.

21. I have control over my emotions.

22. I easily recognize my emotions as I experience them.

23. I motivate myself by imagining a good outcome to tasks I take on.

24. I compliment others when they have done something well.

25. I am aware of the non-verbal messages other people send.

26. When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself.

27. When I feel a change in emotions, I tend to come up with new ideas.

28. When I am faced with a challenge, I give up because I believe I will fail.

29. I know what other people are feeling just by looking at them.

30. I help other people feel better when they are down.

31. I use good moods to help myself keep trying in the face of obstacles.

32. I can tell how people are feeling by listening to the tone of their voice.

33. It is difficult for me to understand why people feel the way they do.