The Levels of Emotional Awareness Scale and Emotional Expressivity

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AUTHOR NOTE

ABSTRACT

Emotional Intelligence is the ability to understand and manage your own and other people's emotions. Since this term was coined by Salovey and Mayer in 1990, several tests have been designed to measure this construct. Probably the most important aspect of Emotional Intelligence is the ability to understand emotions, and this aspect of Emotional Intelligence is measured by the Levels of Emotional Awareness Scale (LEAS; Lane, Quinlan, Schwartz, Walker, & Zeitland, 1990). This test was designed to assess the degree of differentiation and complexity of emotion-related constructs, and evidence has slowly been accumulating to indicate that it does indeed measure this. However, scores on this test may also be influenced by subjects' willingness to express their emotions. The purpose of this study was to examine this hypothesis.

Over three hundred subjects completed a short-form of the LEAS, measures of Positive and Negative Expressivity (the tendency to express positive and negative emotions, respectively), and various self-report and maximal-performance measures of Emotional Understanding and the related construct of Social Insight. The relation between LEAS scores and expressivity was examined using both between-groups and within-groups approaches.

Two between-group analyses were conducted. First, sex differences in Positive Expressivity were statistically significant, and paralleled sex differences on the LEAS. Ethnic differences in expressivity, however, were not statistically significant and so could not be used to predict ethnic differences on the LEAS (however, these non-significant differences were in the same direction as the differences on the LEAS).

Within sex, the LEAS correlated significantly with Positive Expressivity, but not Negative Expressivity. The correlation with Positive Expressivity was then compared to the statistically-significant correlations with the self-report and maximal-performance tests of Emotional Understanding and Social Insight: no significant differences were found, indicating that LEAS scores are as closely related to Positive Expressivity as they are to Emotional Understanding and Social Insight. That LEAS scores are possibly influenced by emotional expressivity (and particularly Positive Expressivity) is therefore tentatively concluded. Research on the helpfulness of instruction revision is therefore recommended, as this will both further test the possible influence of emotional expressivity on LEAS scores, and perhaps reduce this influence.

THE LEVELS OF EMOTIONAL AWARENESS SCALE AND EMOTIONAL EXPRESSIVITY

The term "Emotional Intelligence" was coined just over one decade ago (Salovey & Mayer, 1990). Since then, interest in this concept has quickly grown. There are now a number of books on Emotional Intelligence (e.g., Goleman, 1995, 1998) and several tests that claim to measure various aspects of this construct (e.g., Lane et al., 1990; Bar-On, 1997; Mayer, Salovey, & Caruso, 1999; Mayer, Caruso, & Salovey, 2000). However, measurement in this area is in its infancy. None of the existing tests have been examined in detail to ensure their reliability and validity. Before these tests are used to make important decisions about individuals, detailed examination of these tests is needed.

Probably the most important aspect of Emotional Intelligence is the ability to understand emotions, and this aspect of Emotional Intelligence is measured by the Levels of Emotional Awareness Scale (LEAS; Lane et al., 1990). Specifically, this test attempts to measure the depth and breadth of understanding of emotion-related concepts. In this test, subjects are presented with 20 emotionally-evocative interpersonal situations, and are asked to describe the emotional responses of both themselves and the other person in the scenario. Responses are scored based on the number and complexity of emotion-words used, according to guidelines in the scoring manual. For each item, one score is given for responses for the Self, another score is given for responses for the Other, and a Total score is calculated.

There is some evidence that LEAS Total scores reflect the degree of differentiation and complexity of emotion knowledge. Lane, Sechrest, Reidel, Weldon, Kasniak, and Schwarz (1996) found that Total scores on the LEAS are negatively correlated ($r = -19$, $p < .001$) with the Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994; Bagby, Taylor, & Parker, 1994), a 20-item self-report measure of difficulty understanding emotions. As well, these same authors found that LEAS Total scores are positively correlated ($r = .43$. $p < .001$) with a 140-item maximum-performance measure of the ability to match verbal or nonverbal emotion stimuli with verbal or nonverbal emotion responses (the Perception of Affect Task). Finally, Lane, Reiman, Axelrod, Yun, Holmes, and Schwartz (1998) found that higher LEAS Total scores were associated with greater activity in the Anterior Cingulate Cortex (ACC), during processing of film- and recall-induced emotion. Previous research has shown that the ACC is activated during emotion and pain.

The discriminant validity of the LEAS has also been assessed. Lane et al. (1990) showed that LEAS Total scores are unrelated to ratings of intensity of positive and negative emotions on a typical day, to the tendency to respond in a socially-desirable manner, and to the number of words used in LEAS responses.

Thus, there is some evidence that the LEAS measures the degree of differentiation and complexity of emotion-related constructs. On the other hand, if subjects have not been adequately motivated to describe their emotions during testing, personality differences in the tendency to express one's emotions may create differences in test scores that are unrelated to subjects' understanding of emotions. This problem is much more likely to occur with the LEAS than with other maximum-performance measures of Emotional Understanding, because the LEAS uses an open-ended response format.

If emotional expressivity is affecting test scores on the LEAS, this would be seen in two ways. First, LEAS scores would correlate with measures of expressivity. I hypothesize that the correlations of the LEAS with expressivity will be higher than the correlations between expressivity and other maximum-performance measures of Emotional Understanding or the related construct of Social Insight.

Second, between-group differences in expressivity would be paralleled by between-group differences on the LEAS. Previous research has shown that women are often more emotionally expressive than men (Friedman, Prince, Riggio & DiMatteo, 1980; Dosser, Blaswick, & Halverson, 1983; Roger & Nesshoever, 1987; King & Emmons, 1990; Gross & John, 1995), and that women score higher than men on the LEAS (Feldman-Barrett, Lane, Sechrest, & Schwartz, 2000). These findings would be consistent with the hypothesis that expressivity influences LEAS scores. This study seeks to replicate these two findings in a single study, and to extend these findings by conducting a mediator analysis to determine if differences in emotional expressivity can account for the observed sex differences. In

addition, this study will also examine ethnic differences: if ethnic differences in emotional expressivity exist, I would predict parallel differences in LEAS scores.

METHOD

Participants and Procedure

A total of 303 Psychology undergraduates (93 men and 210 women) volunteered for this study for course credit. Participants were obtained from two different sources. Subjects from the first source volunteered for a 2-hour study. Subjects from the second source volunteered for a 3.5-hour study, and were able to complete a larger number of measures. They ranged from 17 to 48 years (mean 20.25, SD 3.56), and were mostly Asian (48.9%) and White (37.5%). There were some participants for whom English was their second language, but all of these had spoken English for at least 10 years and rated themselves as very comfortable reading and writing English.

Participants completed the LEAS and other non-questionnaire measures in group testing sessions. Self-report questionnaires were administered in both group-testing sessions and take-home packages.

Measures

LEAS. A five-item short form of the LEAS (Lane et al., 1990) was used, consisting of items 3, 6, 11, 16, and 17. During item selection, I tried to create a set of items that was representative of the longer form.

Each protocol was scored by two trained research assistants and disagreements were resolved. These research assistants were blind to the sex and ethnicity of the participants. The between-pair inter-rater reliability of average Total scores (the average of the Total scores for each item) obtained using this procedure was examined using a set of 40 protocols, and was found to be .96. Coefficient alpha of the average Total scores was .59 for the 5-item form. Using the Spearman-Brown formula, I estimate the internal consistency of the 20-item form would be .85.

PES. The Positive Expressivity Scale (PES; Barchard, 2001) is a 10-item self-report measure of the tendency to express positive emotions. It uses a 5-point likert scale, and had an internal consistency of .79.

NES. The Negative Expressivity Scale (NES; Barchard, 2001) is a 10-item self-report measure of the tendency to express negative emotions. It uses a 5-point likert scale, and had an internal consistency of .74.

MSCEIT. Four subtests of the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) Version 1.0 (Mayer et al., 1999) were designed to measure Emotional Understanding: Blends, Progressions, Transitions, and Analogies. Because the publishers of the MSCEIT (Multi-Health Systems) will not release the scoring key for this test, it is not possible to calculate the internal consistencies of these scales in this sample. However, Mayer (personal communication, July 2000) reported the internal consistencies of these scales as .58, .50, .57, and .37 respectively, for their normative sample.

Expression Grouping. The Expression Grouping test (O'Sullivan & Guilford, 1976) is a timed maximum-performance test of understanding of non-verbal expressions of thoughts, feelings, and emotions. Only Part I of this test was used. Coefficient alpha was .31.

Emotional Appropriateness. The Emotional Appropriateness subscale of Tett's Emotional Intelligence Scale (Tett, Wang, Fisher et al., 1997; Tett, Wang, Gribler, et al., 1997) is a 12-item measure of the ability to differentiate between similarly experienced emotions. The items use a 5-point likert format, where for each item one end of the scale represents an appropriate emotional reaction, and the other end represents an inappropriate emotional reaction. Coefficient alpha was .36.

Recognition of Emotion in Others. This subscale of Tett's Emotional Intelligence Scale (Tett, Wang, Fisher et al., 1997; Tett, Wang, Gribler, et al., 1997) is a 12-item self-report measure of one's ability to detect and understand others' feelings. Coefficient alpha was .80.

TAS-20.   The Toronto Alexithymia Scale – 20 (TAS-20; Bagby, Parker et al., 1994; Bagby, Taylor et al., 1994) is a 20-item self-report measure of alexithymia. Two of the three subscales were used: Difficulty Identifying Feelings, and Difficulty Describing Feelings. In this sample, coefficient alphas were .82 and .83, respectively.

The O'Sullivan and Guilford (1976) tests of Social Insight.   Missing Cartoons, Social Translations, and Cartoon Predictions are three tests that were originally designed to measure understanding of behaviour systems, transformations, and implications, respectively. I consider all of these tests to measure Social Insight. Each test is a timed maximum-performance test, and only Part I of each of these tests was used. Coefficient alpha for the three tests were .55, .64, and .44, respectively.

RESULTS

Within Group Relations

Data from two different groups (such as men and women) can be combined into a single correlational analysis without regard to group membership if two conditions are met. First, there must be no mean-differences between the groups on the variables, or the mean-differences need to be eliminated through mean-deviating. Second, the relations among the variables need to be the same for the two groups. I tested the hypothesis that group means were equal for men and women using Hotelling's T-squared. There were significant differences ($F(16, 91) = 2.26$, $p = .008$). I tested the equality of the relations among the variables using the Bartlett-Box test, and found no significant difference (Box's M = 156.13, chi-square (136) = 129.49, $p = .641$). Therefore, a combined analysis of the within-group relations between LEAS scores and expressivity is possible, once all variables have been mean-deviated within sex to eliminate the mean differences.

Within groups, differences in emotional expressivity may be associated with differences in LEAS scores. To examine this question, correlations were calculated between the LEAS and each of the other measures, once all variables had been mean-deviated within sex. See Table 1.

The correlation between average LEAS Total scores and Negative Expressivity was small and not significantly different from zero; however the correlation between the LEAS Total scores and Positive Expressivity was moderate ($r = .28$, $p = .003$). In contrast, no other maximum-performance measure of either Emotional Understanding or Social Insight had statistically significant correlations with either Positive or Negative Expressivity.

Several measures of Emotional Understanding and Social Insight also had significant correlations with LEAS Total scores. However, the correlation with Positive Expressivity is higher than the correlation with the other variables. This raises the question of whether the relation with Positive Expressivity is stronger than the other relations. Using average LEAS Total scores, the magnitude of these correlations were compared, using the L_1* statistic recommended by Steiger (1980). No significant differences were found. I conclude that the average LEAS total scores are as closely related to Positive Expressivity as they are to Emotional Understanding or Social Insight, and not that they are more closely related.

These analysis were repeated using average LEAS Self and Other scores. The same general pattern of results emerged for the Self scores (the highest correlation was between average LEAS Self scores and PES), but the correlations for the average LEAS Other scores were somewhat different (the correlations were a bit smaller, and few of them were statistically significant). Previous research with the LEAS has often reported results only for average Total Scores, and it is possible that this tendency has hidden interesting differences in the meaning of Self and Other scores. Future research should report results for all three types of scores.

Between Group Differences

Sex Differences

       Scores on the PES and NES and average scores on the LEAS Self, Other and Total scores were compared for men and women. See Table 2. On all five variables, women had slightly higher scores. These differences were statistically significant for Positive Expressivity, and LEAS Other and Total scores. I conclude that sex differences in Positive Expressivity are paralleled by sex differences in Other and Total scores on the LEAS.

       Next I conducted a mediator analysis to test the hypothesis that Positive Expressivity mediates the relation between sex and LEAS Total scores. I followed the procedure described by Baron and Kenny (1986). In a series of multiple regressions, I showed that 1) sex is positively associated with LEAS Total scores, 2) sex is positively associated with PES scores, 3) PES scores are positively associated with LEAS Total scores, and 4) the relationship between sex and LEAS Total scores becomes non-significant if LEAS Total scores are regressed on both sex and PES. See Table 3. This suggests (but of course does not demonstrate) that the sex differences on the LEAS may be caused by the sex differences in Positive Expressivity.

       These analyses were repeated to test the hypothesis that Negative Expressivity mediates the relation between sex and LEAS Total Scores, but several of the required relations did not hold. Therefore, there is no evidence that Negative Expressivity mediates the relation between sex and LEAS Total Scores, for the 5-item short form of the LEAS used in this research.

Ethnic Differences

       Scores on the PES and NES and average scores on the LEAS Self, Other, and Total were compared for Whites and Asians. See Table 4. On all five scales, scores were slightly higher for Whites, although these differences did not reach significance on the PES or NES. Because the differences in emotional expressivity were non-significant, this data provides only very weak support for the claim that ethnic differences in expressivity are paralleled by differences on the LEAS. One limitation of this research is that self-reported measures of expressivity were used, and future research should look for ethnic differences in objectively-measured emotional expressivity. A second limitation is that the two ethnic groups may not have been sufficiently distinct, given that participants were all university students, and lived in the same general area. Future research should use more disparate ethnic groups to examine this hypothesis.

CONCLUSIONS AND RECOMMENDATIONS

       In summary, LEAS scores are associated with both between-group and within-group differences in Positive Expressivity. One limitation of this research is that only 5 of the original 20 LEAS items were used. Although these items were selected to be representative, it would be useful to replicate this research using the entire 20-item form. Such research could 1) confirm the association of LEAS scores with Positive Expressivity 2) confirm that Positive Expressivity mediates the relation between sex and LEAS Total scores, and 3) check whether Negative Expressivity is associated with scores on some LEAS items.

       At this point, I tentatively conclude that emotional expressivity may be having an influence on LEAS scores, and that steps should be taken to remove this possible influence. Two approaches are possible. First, it should be possible to revise the instructions on the LEAS so as to motivate subjects to describe their emotions fully. A variety of instruction formats could be attempted, and their ability to reduce sex differences and the correlation with Positive Expressivity (and possibly Negative Expressivity) could be noted. If instruction modification is not successful, or if a researcher or clinician wishes to obtain a better estimate of a persons' Emotional Understanding using existing data, then it may be possible to partial out Positive Expressivity (and perhaps Negative Expressivity) using statistical techniques if a large enough sample is available to make residual scores adequately reliable. The success or failure of these attempts to reduce sex differences will provide further evidence regarding the validity of the hypothesis that emotional expressivity influences scores on the LEAS.

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Table 1
Correlations Among Variables

	LEAS			Emotional Understanding Maximum-Performance						Emotional Understanding Self-Report			Social Insight			Emotional Expressivity	
	Self	Other	Total	M C	M D	M H	M L	EG	EA	RO	DDF	DIF	CP	MC	ST	PES	NES
Self	1.00																
Other	.37**	1.00															
Total	.79**	.71**	1.00														
M C	.17**	.16**	.19**	1.00													
M D	.18**	.09	.16**	.35**	1.00												
M H	.10	.03	.14*	.34**	.30**	1.00											
M L	.12*	.07	.10	.12*	.14*	.15*	1.00										
EG	.17**	.09	.14*	.13*	.07	.08	.04	1.00									
EA	.08	-.01	.04	.17**	.07	.00	.01	.05	1.00								
RO	.08	.13*	.14*	.09	.01	.10	.01	.00	-.12*	1.00							
DDF[a]	.06	.05	.07	.08	.06	-.01	-.05	.05	.08	.28**	1.00						
DIF[a]	.00	-.01	.02	.21**	.15*	.22**	-.06	.07	.08	.18**	.53**	1.00					
CP	.08	.00	.06	.13	.03	.01	.02	.23**	.01	.05	.05	.13	1.00				
MC	.28**	.07	.20*	.23**	.19*	.20*	.23**	.13	-.01	.15	.03	.09	.32**	1.00			
ST	.07	.04	.12	.23**	.20*	.27**	.09	.16	-.09	.10	-.15	-.19*	.21*	.29**	1.00		
PES	.31**	.13	.28**	.16	.07	-.00	.09	.12	.01	.34**	-.51**	-.25**	.09	.09	.12	1.00	
NES	.09	.08	.09	-.04	-.02	-.10	-.10	.04	.11	-.19*	-.29**	-.10	.13	-.03	-.12	.17	1.00

* p < .05. ** p < .01.
a. Scores on the Difficulty Describing Feelings and Difficulty Identifying Feelings scales were reversed so that higher scores indicate greater Emotional Understanding.
M C = MSCEIT C (Blends). M D = MSCEIT D (Progressions). M H = MSCEIT H (Transitions). M L = MSCEIT L (Analogies). EG = Expression Grouping. EA = Emotional Appropriateness. RO = Recognition of Emotion in Others. DDF = TAS Difficulty Describing Feelings. DIF = TAS Difficulty Identifying Feelings. CP = Cartoon Predictions. MC = Missing Cartoons. ST = Social Translations. PES = Positive Expressivity Scale. NES = Negative Expressivity Scale.

Table 2
Comparing Means on the LEAS and Expressivity for Men and Women

	Mean			Standard Deviation		Sample Size	
	Men	Women	*p*	Men	Women	Men	Women
LEAS Self	3.25	3.35	.121	.44	.52	93	210
LEAS Other	2.94	3.09	.021	.52	.50	93	210
LEAS Total	3.72	3.86	.034	.49	.52	93	210
Positive Expressivity	3.54	3.80	.050	.65	.67	42	72
Negative Expressivity	3.18	3.27	.496	.63	.67	42	72

Table 3
Mediator Analysis for the PES and the NES

Regression	Dependent Variable	Independent Variables	b-weight	Beta-weight	*p*
		PES as Mediator			
1	LEAS	Sex	.135	.122	.034
2	PES	Sex	.274	.184	.050
3	LEAS	PES	.208	.278	.003
4	LEAS	Sex	.081	.074	.431
		PES	.198	.265	.005
		NES as Mediator			
1	LEAS	Sex	.135	.122	.034
2	NES	Sex	.092	.064	.496
3	LEAS	NES	.082	1.128	.262
4	LEAS	Sex	.128	.116	.221
		NES	.077	.098	.299

Table 4
Comparing Means on the LEAS and Expressivity for Whites and Asians

	Mean			Standard Deviation		Sample Size	
	White	Asian	*p*	White	Asian	White	Asian
LEAS Self	3.45	3.24	.001	.44	.52	116	151
LEAS Other	3.13	2.99	.033	.47	.53	116	151
LEAS Total	3.94	3.74	.001	.50	.50	116	151
Positive Expressivity	3.78	3.63	.276	.61	.71	42	56
Negative Expressivity	3.32	3.23	.505	.65	.71	42	56