

Abstract

The Levels of Emotional Awareness Scale (LEAS; Lane, 1991) is an open-ended test of differentiation and complexity in the use of emotion words. Respondents indicate how they would feel in 20 emotionally evocative situations. Originally, the LEAS could only be scored by hand, which was time-consuming. Program for Open-Ended Scoring (POES; Leaf & Barchard, 2007) was developed to accelerate scoring. One criticism of both hand-scoring and the four POES scoring methods is that they allow respondents to obtain high scores by using the same emotion words repeatedly. A new scoring method was developed to overcome this limitation. The four existing POES methods calculate scores in three steps. First, individual words are scored. For example, "hate" is scored 3. Second, 20 item scores are calculated based upon these word scores. Finally, total scores are calculated from the item scores. The AllSum-AllinOne method differs from the POES methods in that item scores are not calculated. If the same word is used in several items, the respondent only receives credit once.

Each of the five computerized scoring methods was correlated with the four branches of the Mayer-Salovey-Caruso Emotional Intelligence Test (Mayer, Salovey, & Caruso, 2002). All correlations were positive and significant, demonstrating the convergent validity of all five methods. These results imply that computerized scoring can be used in situations where hand-scoring is not feasible. Computerized scoring could increase research on the relationship of Emotional Awareness to clinical disorders, and allow the use of the LEAS in applied clinical settings.

This study also found that the correlations for the AllSum-AllinOne method were higher than the correlations for three of the four POES methods. Researchers should develop additional computerized scoring methods

Introduction

Emotional awareness has been defined as the depth and breadth of one's knowledge of emotion concepts (Lane, Quinlan, Schwartz, Walker, & Zeitlin, 1990). The Levels of Emotional Awareness Scale (LEAS; Lane, 1991) was developed to measure differentiation and complexity in the use of emotion words. One study showed that people who possess higher levels of emotional awareness are less likely to make decisions based on their mood (Ciarocchi, Caputi, & Mayer, 2003). It has also been shown that people with lower skills on the LEAS are more likely to possess certain disorders such as depression (Berthoz, Ouhayoun, Parage, Kirzenbaum, Bourgey, & Allilaire, 2000; Donges, Kersting, Dannowski, Lalee-Mentzel, Arolt, & Suslow, 2005), post traumatic stress disorder (Frewen, Lane, Neufeld, Densmore, Stevens, & Lanius, 2008), and eating disorders (Bydlofski, Corcos, Jeammot, Paterniti, Berthoz, Laurier, et al., 2005).

Previously, the only way to score the LEAS was by hand. This was a time-consuming process that could be somewhat subjective. Different scorers could arrive at different scores. Leaf and Barchard (2007) developed Program for Opened Ended Scoring (POES) to speed scoring and eliminate subjectivity. This computer program calculates four types of scores for each taker: All-Sum, Highest-4, 334, and 3345. POES scores correlate highly with hand scoring, indicating that this is a valid and useful means of scoring the LEAS when hand scoring is not practical (Barchard, Bajgar, Leaf & Lane, 2008). One problem with both hand scoring and POES scoring is that a respondent receives credit for using the same emotion word more than once. Theoretically, a person could use the same few emotion words in every item and receive a perfect score. We developed a new scoring method to overcome this limitation. The AllSum-AllinOne method gives credit for each emotion word the first time it is used. A person who used the word "happy" once throughout their entire test would receive 3 points, and a person who used "happy" five times on the test would also receive only 3 points.

The purpose of this study is to examine the validity of the new AllSum-AllinOne scoring method, and to compare it to the validity of the four POES scoring methods. We correlated these five computerized

Method

perceive, understand, use, and manage emotions, and thus emotional awareness should have a moderate positive relationship with it.

Participants

A total of 375 undergraduate students (213 females, 162 males) participated in this study in return for course credit. Their ages ranged from 18 to 50 (mean 19.98, standard deviation 3.49). Of the participants, 57.6% identified themselves as Caucasian, 6.9% as African American, 12.3% as Asian, 12.8% as Hispanic, 6.4% as Pacific Islander, 0.3% as Native American and 3.7% as Other.

Measures

LEAS

The Levels of Emotional Awareness Scale (LEAS; Lane, 1991) consists of 20 open-ended questions. Each

Method Con't

Hand scoring

When scoring the LEAS by hand, item scores are calculated in three steps. First, the words in the response receive scores from 0 to 3, using the rules in the LEAS Scoring Manual (Lane, 1991). Often the scores for the words can be found in the LEAS Glossary, but sometimes subjective scoring rules must be used to determine the appropriate score. Second, scores are calculated for the emotional response of the self and the other person in the scenario. The self score is equal to the highest score for the emotions attributed to the self, unless there are two distinguishable emotions attributed to the self, in which case the self score is 4. The other score is calculated in the same way, using the emotions that were attributed to the other person. Finally, now that the self and other scores have been calculated, it is possible to calculate the item score. The item score is usually calculated as the highest of the self and other scores. However, if the self and other scores are both 4 and the emotions attributed to the two people are different, then the item score is 5.

POES Scoring

Program for Open-Ended Scoring (POES; Leaf & Barchard, 2007) was designed to score the LEAS. To score an open-ended test, POES compares the participants' response with the words and phrases in a Wordlist. The words and phrases in the Wordlist are called valuables and the scores that are associated with them are called their values. We used the LEAS Wordlist 2.1 (Barchard, 2006), which is an extension of the original LEAS Glossary. POES could be used to score other tests by using other Wordlists.

The four POES methods all start by scanning the item response for words and phrases that occur in the Wordlist, and putting these in a Valuables List. Then they use the Valuables Lists for each item to calculate the item score. The AllSum method calculates the item score as the sum of all values in the Valuables List. The Highest-4 method calculates the sum of the four highest values in the Valuables List. The 334 method calculates the item score as the highest value in the valuables list, unless there are two non-identical values with a value of 3, in which case the item score is 4. The 3345 method is the closest to hand scoring. It calculates the item score in three steps. First, it forms separate Valuables Lists for the two separate questions, "How would you feel?" and "How would the other person feel?" Second, it calculates scores for each of these Valuables Lists, using the 334 method. Finally, it calculates the item score as the highest of these two scores, unless both scores are 4, in which case the item score is 5. All four POES methods then calculate the total score as the sum of the item scores. Thus, in all four POES methods, participants receive credit for emotion words in every item in which they are used.

AllSum-AllinOne Scoring

The AllSum-AllinOne method calculates the item score in three steps. First, it creates a Valuables List for all responses to all 20 items. Second, duplicate words are deleted. Finally, the item score is calculated as the sum of the values for these non-identical valuables.

MSCEIT

The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, & Caruso, 2002) is the most commonly used measure of cognitive skills related to emotions. People who score higher on the MSCEIT have more pro-social behaviors, satisfying relationships, and success in the workplace (Salovey & Grewal, 2005). The MSCEIT has 141 items that measure four branches: perceiving, using, understanding, and managing emotion. Each branch is measured using two tasks.

Branch 1, Perceiving Emotion, includes the Faces and Pictures Tasks. In the Faces Task, a participant is shown a face and asked to rate the extent to which this person feels various emotions. The Pictures Task is similar to the Faces Task; however, participants are shown landscapes and abstract designs.

Branch 2, Using Emotion, includes the Sensations and Facilitation Tasks. In the Sensations Task, the participant matches emotions to sensations. For example, a participant may be asked to identify how hot or cold "anger" is. In the Facilitation Task, the participant identifies which emotions would best facilitate cognitive tasks.

Branch 3, Understanding Emotion, includes the Blends and Changes Tasks. In the Blends Task, respondents identify which emotions could be combined to form other emotions. The Changes Task involves identifying which emotion, when intensified, becomes another emotion (for example, when anger is intensified, it turns into rage).

Finally, Branch 4, Managing Emotion, includes the Emotion Management and Relationships Tasks. In the Emotion Management Task, the respondent identifies which actions will be most helpful in obtaining a certain emotional state. In the Relationships Task, the respondent indicates which action would be most helpful in achieving a certain relationship objective.

Procedure

The LEAS and MSCEIT were completed over the Internet as part of a larger study. The study was taken over the course of two sessions, which took approximately an hour and half each.

Analysis

To assess the validity of the new AllSum-AllinOne scoring method, we correlated the new AllSum-AllinOne scores with the four branches of the MSCEIT. To compare the validity of this new method with the validity of the four POES methods, we correlated the four POES scores with the four branches of the MSCEIT.

Table 1
Correlations between the Five Scoring Methods and the Four Branches of the MSCEIT

Scoring Method	MSCEIT Branch			
	Perceiving Emotion	Using Emotion	Understanding Emotion	Managing Emotion
AllSum	.16*	.18*	.31*	.26*
Highest-4	.21*	.24*	.40*	.35*
334	.18*	.22*	.32*	.30*
3345	.18*	.20*	.37*	.30*
AllSum-AllinOne	.20*	.22*	.40*	.32*

* $p < .001$.

Results

The correlations between the five computer scoring methods and the four branches of the MSCEIT were all positive and significant (see Table 1). We hypothesized that the AllSum-AllinOne scoring method would have the highest correlations with the four branches of the MSCEIT. However, the correlations for the AllSum-AllinOne method were not higher than the correlations for Highest-4 method.

Conclusions

This study sought to assess the validity of five different computerized scoring methods for the LEAS. We hypothesized that all five methods would have significant positive correlations with the four branches of the MSCEIT. Twenty correlations were calculated. All were positive and statistically significant. These results demonstrate the convergent validity of all five computerized scoring methods. Most importantly, they provide the first evidence of the validity of the AllSum-AllinOne scoring method.

We also hypothesized that the AllSum-AllinOne method would possess higher validity than the POES scoring methods. However, the correlations between the AllSum-AllinOne method and the four branches of the MSCEIT were not higher than all of the correlations for the four POES methods of scoring. In particular, the Highest-4 method consistently had the highest correlations with the four branches of the MSCEIT. Thus, the new scoring method is a valid means of scoring, but it is not the most effective of the computer scoring methods that have been developed so far.

Future research should examine new methods of scoring the LEAS with computers. The following are some methods that would reduce the influence of duplicate words on total scores, and are conceptually similar to the Highest-4 method, which has the strongest validity evidence. The first new method, which could be called Highest-4-NoDuplicates, would calculate the score for the first item by taking the sum of the values for the four highest valued words. The item score for the second item would be calculated as the sum of the values for the four highest valued words that had not been used in the first item. The elimination of duplicates would continue across items, so that test takers only receive credit for words the first time they are used. Another method, which could be called the Highest80-AllinOne, would calculate the total score as the sum of the values for the 80 words that had the highest values across all 20 items, after duplicates had been eliminated. These new scoring methods may be as valid (or more valid) than the Highest-4 method, and thus facilitate the use of the LEAS in research and clinical practice. Given the centrality of emotional awareness to a number of clinical disorders, expanded use of the LEAS may facilitate greater understanding of the etiology of these disorders and more effective treatment.

References

- Barchard, K. A. (2006). *LEAS Wordlist 2.1*. File to be used with Program for Open-Ended Scoring to allow scoring of the Levels of Emotional Awareness Scale. Available from Kim Barchard, Department of Psychology, University of Nevada, Las Vegas, 4505 S. Maryland Parkway, Las Vegas, NV, 89154-5030, barchard@unlv.nevada.edu
- Barchard, K. A., Bajgar, J., Leaf, D. E., & Lane, R. D. (2008). *Computer scoring of the Levels of Emotional Awareness Scale*. Manuscript submitted for publication. Available from Kim Barchard, Department of Psychology, University of Nevada, Las Vegas, 4505 S. Maryland Parkway, Las Vegas, NV, 89154-5030, barchard@unlv.nevada.edu
- Berthoz, S., Ouhayoun, B., Parage, N., Kirzenbaum, M., Bourgey, M., & Allilaire, J. F. (2000). Etude préliminaire des niveaux de conscience émotionnelle chez des patients déprimés et des contrôles. [A preliminary study of the levels of emotional awareness in depressed patients and controls.] *Annales Médico-Psychologiques, 158*, 665-672.
- Bydlofski, S., Corcos, M., Jeammot, P., Paterniti, S., Berthoz, S., Laurier, C., et al. (2005). Emotion-processing deficits in eating disorders. *International Journal of Eating Disorders, 37*, 321-329.
- Ciarocchi, J., Caputi, P., & Mayer, J. D. (2003). The distinctiveness and utility of a measure of trait emotional awareness. *Personality and Individual Differences, 34*, 1277-1490.
- Donges, U., Kersting, A., Dannowski, U., Lalee-Mentzel, J., Arolt, V., & Suslow, T. (2005). Reduced awareness of other's emotions in unipolar depressed patients. *Journal of Nervous & Mental Disease, 193*, 331-337.
- Frewen, P., Lane, R. D., Neufeld, R. W. J., Densmore, M., Stevens, T., & Lanius, R. (2008). Neural correlates of the Levels of Emotional Awareness during trauma script-imagery in posttraumatic stress disorder. *Psychosomatic Medicine, 70*, 27-31.
- Lane, R. D., Quinlan, D.M., Schwartz, G. E., Walker, P. A., & Zeitlin, S. B. (1990). The Levels of Emotional Awareness Scale: A cognitive-developmental measure of emotion. *Journal of Personality Assessment, 55*, 124-134.
- Lane, R. D. (1991). *LEAS Scoring Manual and Glossary*. Unpublished manual for the Levels of Emotional Awareness Test. Available from Richard D. Lane, General Clinical Research Center, University of Arizona, PO Box 245002, Tucson, AZ 85724-5002.
- Leaf, D. E., & Barchard, K. A. (2007). *Program for Open-Ended Scoring [POES] version 1.3.1*. Windows-based program that scores open-ended tests according to the criteria given in the selected Wordlist.
- Mayer, J. D., Salovey, P., & Caruso, D. R. (2002). *Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) user's manual*. Toronto, ON, Canada: Multi-Health Services.
- Salovey, P., & Grewal, D. (2005). The science of emotional intelligence. *Current Directions in Psychological Science, 14*, 281-285.