

## Abstract

The Metaphors Test measures Emotion Perception using verbal stimuli. Unlike some Emotion Perception Tests, the Metaphors Test requires abstract interpretation. Results demonstrate its internal consistency and convergent validity with other tests of Emotion Perception and Emotional Intelligence. Future research should explore differences between literal and abstract interpretation of emotional stimuli.

## Introduction

People express and interpret emotions both verbally and non-verbally. In the last two decades, emotionally laden communication has increased its reliance on written media. Therefore, the ability to perceive emotional content in verbal stimuli is more important than it has ever been. However, most tests of Emotion Perception only use non-verbal stimuli. For example, the Perceiving Emotions branch of the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, & Caruso, 2002) uses pictures of faces, abstract designs, and landscapes. The purpose of this study was to design a measure of Emotion Perception that uses verbal stimuli.

However, we did not want to design a test of the literal meaning of words. Consider the sentence: "I am depressed and unhappy". To state what emotion is conveyed by that sentence, the test taker needs to have a good emotion vocabulary. No additional skill is needed beyond the literal interpretation of these words in order to perceive their emotional content. We do not consider this to be a test of Emotion Perception. This is a test of Emotion Vocabulary. A test of Emotion Perception must go beyond literal interpretations of words. Abstract interpretation must be required.

We therefore designed our test based on metaphors. Metaphors can be interpreted both literally and abstractly. However, literal interpretations are insufficient to perceive the emotional content. This is demonstrated by research showing that psychopaths can interpret the literal meaning of metaphors even though they cannot perceive the most basic emotional content (e.g., is the metaphor positive or negative; Hervé, Hayes, & Hare, 2003). In Study 1, we selected items for inclusion on our test. In Study 2, we examined the quality of our test.

## STUDY 1

The purpose of Study 1 was to select items for inclusion on the Metaphors Test.

## Method

### Participants

The derivation sample included 175 undergraduates (103 female and 72 male), who completed this study online in return for course credit.

### Measures

#### Metaphors Test Item Pool

Our initial item pool included 48 metaphors that were taken with permission from Katz, Paivio, Marschark, and Clark (1988) and Hervé et al. (2003). Participants were asked to imagine that someone said each metaphor, and to imagine what that person was feeling. They rated the extent to which the speaker was feeling each of five to nine emotions, using a five-point scale (1 = not at all, 5 = extreme). This resulted in a total of 384 items.

The 384 emotions in our item pool were scored using proportion consensus scoring. In proportion consensus scoring, one's score on an item is equal to the proportion of the norm group who gave the same response. For example, if 30% of the norm group selected option c, then this response receives a score of .30.

#### MSCEIT

The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, & Caruso, 2002a, 2002b) includes 141 questions that measure four branches of Emotional Intelligence: Perceiving Emotions, Facilitating Thought, Understanding Emotions, and Managing Emotions. Each branch is measured using two tasks. To select items for the Metaphors Test, we examined the relationship between each item from the item pool and MSCEIT total scores.

### Analysis for Item Selection

The purpose of Study 1 was to select emotions and metaphors for inclusion on the Metaphors Test. We first identified high quality emotions and metaphors. We used three types of analyses. First, for every emotion, we examined the proportion of respondents who selected each of the five responses (e.g., 1 = "not at all," 2 = "somewhat"). We wanted to find proportions that suggested that the emotion was clearly present or that the emotion was clearly absent. Second, we examined the relationship between the emotions in the item pool and the MSCEIT. We wanted to select emotions where emotionally intelligent people picked different responses than other people, and where the proportion consensus scoring key that we are using gives emotionally intelligent people higher scores. Third, we examined the emotions themselves. We preferred emotions that covered a wide variety of emotional experiences within each metaphor and across the entire test. After initial emotion screening, we picked the best 10 metaphors and the best three emotions for each, based upon the criteria discussed above.

## Results

After the selection process was finished, we had ten metaphors with three emotions each, for a total of thirty items. All 30 emotions have significant correlations with total MSCEIT scores.

## STUDY 2

The purpose of Study 2 was to evaluate the reliability and validity of the Metaphors Test, using a new sample.

## Method

### Participants

The validation sample consisted of 106 undergraduates (60 females, 46 males), who completed this study in return for course credit.

### Measures

#### The Metaphors Test

Participants in both studies completed the entire set of 384 items from the original item pool. However, for Study 2, we only scored the items we selected during Study 1. The total test score was calculated as the sum of the item-level scores for each of the 30 items. See Figure 1 for an example item.

#### MSCEIT

We correlated total scores on the Metaphors Test with the task, branch, and total scores from the MSCEIT (Mayer et al., 2002a, 2002b).

#### Levels of Emotional Awareness Scale

The Levels of Emotional Awareness Scale (LEAS; Lane, Quinlan, Schwartz, Walker, and Zeitlin, 1990) consists of twenty emotionally evocative scenarios involving the self and another person. Participants describe how they would

**Figure 1**  
*Metaphors Test Example Item*

		The Metaphors Test				
		Not at all	A little	Somewhat	A lot	Extreme
Consider each of the following metaphors. To what extent does the metaphor convey each of the emotions given?						
1. Morning is a sheet of clean paper.						
	refreshed	1	2	3	4	5
	upset	1	2	3	4	5
	guilty	1	2	3	4	5

feel in each situation and how the other person in that situation would feel.

#### O'Sullivan and Guilford (1976) Social Intelligence Tests

Expression Grouping, Cartoon Predictions, Missing Cartoons, and Social Translations (O'Sullivan & Guilford, 1976) are multiple-choice tests designed to measure various social and emotional skills.

## Results

The Metaphors Test has strong reliability and validity. Coefficient alpha was .86, indicating strong internal consistency reliability. In addition, the Metaphors Test had significant moderate positive correlations with almost all of the measures of Emotional Intelligence that we examined. See Table 1.

**Table 1**  
*Convergent Validity Coefficients for the Metaphors Test*

Emotional Intelligence Test	Correlation with Metaphors Test
MSCEIT Total Score	.51**
MSCEIT Perceiving Emotions	.50**
Faces Task	.42**
Pictures Task	.27*
MSCEIT Facilitating Thought	.49**
Sensation Task	.49**
Facilitation Task	.37**
MSCEIT Understanding Emotions	.36**
Blends Task	.33**
Changes Task	.29*
MSCEIT Managing Emotions	.32**
Emotion Management Task	.29*
Emotional Relationship Task	.30*
O'Sullivan and Guilford Tests	
Expression Grouping	.31*
Cartoon Predictions	.37**
Missing Cartoons	.31*
Social Translations	.04
LEAS 3345	.36**

\*  $p < .05$ . \*\*  $p < .001$ .

## Discussion

The purpose of this study was to select items for inclusion on the Metaphors Test, which is a new test of Emotion Perception that uses ambiguous verbal stimuli. We started with an item pool of 48 metaphors and 384 emotions. Based upon the proportions of participants who selected each response and the relationship between item scores and the MSCEIT, we selected 10 metaphors with 3 emotions each. In the derivation sample, each of the

30 items had unimodal highly skewed proportions and strong relationships with the MSCEIT, indicating that some responses were better than others. In the validation sample, the final 30-item test had high internal consistency and strong correlations with other tests of Emotion Perception and Emotional Intelligence, demonstrating that it is a promising new measure of Emotion Perception.

The Metaphors Test may be able to contribute towards the prediction of important life outcomes. Emotional Intelligence tests have predictive validity in many situations, but on average they only explain about 4% of the variance (Van Rooy & Viswesvaran, 2004). Thus, a large portion of the variance remains unexplained. The Metaphors Test may be able to assist in prediction when other tests have already been considered, because it captures a unique aspect of Emotion Perception.

The Metaphors Test had its largest correlation with the MSCEIT Sensations Task. After examining the items from both tests we conclude that a similar process is required to answer their items. Both tasks require a literal interpretation of the words before the abstract interpretation is possible, but the literal interpretation in itself is not sufficient. In contrast, many tests of Emotion Perception only require a literal interpretation. For example, some tests require the respondent to look at a picture of a face, gesture, or posture (e.g., Expression Grouping, MSCEIT Faces) and to indicate what the person is feeling. Other tests require the respondent to interpret the feelings, thoughts, and intentions of characters by looking at their faces and postures and the context in which they are shown (e.g., Missing Cartoons, Cartoon Predictions). No abstract interpretation is necessary to know how expressions are related to emotions or to know what situations usually cause what emotions. This knowledge can be gained from first-hand experience, and can also be taught and studied. Thus, the abstract interpretation required by the Metaphors Test is unique.

Some people have difficulty interpreting metaphors. Herve et al. (2003) showed that psychopaths and non-psychopaths are equally adept at interpreting the literal meaning of metaphors, but psychopaths have difficulty interpreting the emotional meaning of metaphors. For example, psychopaths might say that "His face is a ray of sunshine" is very negative. Emotion Perception items that require abstract interpretation may be less transparent than items that only require literal interpretation, may be less sensitive to practice effects, and may be more sensitive to difficulties with emotion processing. This could make abstract items more helpful when diagnosing deficits in emotion processing and more powerful in situations where respondents are motivated to obtain the best test scores possible regardless of their actual skill levels (e.g., job applications and promotions, applications to advanced education programs). Future research should explore the difference between abstract and literal Emotion Perception tasks, to determine if different cognitive processes are involved, to determine if some groups score below average on only the abstract items, and to determine if abstract items are immune to the effect of practice and deliberate study.

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