



## Reading between the Lines: Sex Differences, Metaphors, and Emotion

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### Abstract

The Metaphors Test (Barchard, Anderson, Hensley, & Walker, 2011) is a new measure of emotion perception. It contains ten metaphors. Respondents imagine a person said each metaphor and indicate the extent to which the speaker feels each of three emotions. Most emotion perception tests use non-verbal stimuli (e.g., pictures of faces or gestures, audiotapes of music or voices). The few emotion perception tests that use verbal stimuli (e.g., the Multifactor Emotional Intelligence Scale Stories Task; [Mayer, Caruso, & Salovey, 1999] and the Emotional Accuracy Research Scale [Mayer & Geher, 1996]) include emotion words (e.g., happy) in the item stems. The Metaphors Test is the first test of emotion perception that requires respondents to recognize emotional connotations of non-emotion words. Thus, if the Metaphors Test is valid, it will assess a unique component of emotion perception and broaden our understanding of how emotions are communicated.

Barchard, Anderson, Hensley, and Walker (2011) demonstrated that the Metaphors Test is internally consistent and has strong convergent validity with the emotion perception branch of the Mayer-Salovey-Caruso Emotional Intelligence Test (Mayer, Salovey, & Caruso, 2002). No research has examined the discriminant validity of the Metaphors Test. Previous research has shown that women are better at emotion perception than men (Thayer & Johnson, 2000). Therefore, this study was designed to compare men and women on the Metaphors Test.

One hundred and six participants (46 men, 60 women) completed the Metaphors Test online. Women (mean = 1.17, SD = .48) scored slightly higher than men (mean = 1.04, SD = .49), but this difference was not significant. This could be due to a lack of power. Cohen (1992) showed that 64 people are needed in each group in order to have adequate power to detect a moderate difference ( $d = .50$ ) between two groups, but previous research on sex differences in emotion perception has revealed only small effects. For example, Thayer and Johnson (2000) found an effect size of .12. The current researchers are now designing a study that will provide a more detailed examination of discriminant validity of the Metaphors Test, and plan to use a larger sample.

### Introduction

Emotion perception is the ability to recognize the emotions conveyed by others. Most tests of emotion perception use non-verbal stimuli. For example, the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey, & Caruso, 2002) uses pictures of faces, landscapes, and abstract designs (Mayer, DiPaolo, & Salovey, 1990), and the Profile of Nonverbal Sensitivity (Rosenthal, Hall, DiMatteo, Rogers, & Archer, 1979) uses video clips of people. Only two tests of emotion perception use verbal stimuli: the Emotional Accuracy Research Scale (Mayer & Geher, 1996) and the Stories Task of the Multi-Factor Emotional Intelligence Scale (Mayer, Caruso, & Salovey, 1999). Both tests ask respondents to indicate the emotions conveyed in paragraphs. Both of these tests, however, include emotion words in the stimuli themselves.

The Metaphors Test (Barchard, Anderson, Hensley, & Walker, 2011) is a new test of emotion perception. The test includes ten metaphors, with three emotions each. Respondents are asked to imagine that someone said each metaphor and to rate the extent to which the writer was feeling each of the three emotions. Unlike previous tests of emotion perception that used verbal materials, the item stems do not include any explicit emotion words.

Metaphors may be a useful tool for examining emotion perception because they are used to convey meaning without stating one's meaning directly. Understanding a metaphor requires the reader to go beyond the language contained in the metaphor (Lakeoff, 1993): It requires readers to determine both literal and figurative meaning (Modell, 2009). For example, "He is the apple of my eye" is nonsensical if interpreted literally, but figuratively it indicates that the person is loved. Moreover, metaphors are often used to convey emotional states (Verspoor, 1993). Therefore, we can use metaphors to determine how well a reader is able to decipher the emotional connotations of language.

Previous research has shown that the Metaphors Test is internally consistent, with a coefficient alpha of .86, and has strong convergent validity with the Emotion Perception branch of the MSCEIT (Barchard et al., 2011). This suggests that the Metaphors Test is an appropriate method of measuring emotion perception. However, no research has examined the discriminant validity of the Metaphors Test. Previous research has shown that there are sex differences on tests of emotion perception that use non-verbal stimuli. Specifically, women are better than men at labeling emotions in pictures of faces (Thayer & Johnson, 2000; Montagne, Kessels, Frigerio, de Haan, & Perrett, 2005). The purpose of the current study is to examine the discriminant validity of the Metaphors Test, by comparing average scores for men and women. If women score higher than men, this will lend additional strength to the claim that the Metaphors Test is a valid test of emotion perception.

### Method

#### Participants

A total of 106 undergraduate students (60 females, 46 males) participated in this study in return for course credit. Participants ranged in age from 18 to 39 (mean = 19.99, SD = 3.37) and identified themselves as follows: 57.5% Caucasian, 15.1% Hispanic, 10.4% Asian, 6.6% African American, 5.7% Pacific Islander, 3.8% other, and one person did not specify their ethnicity.

#### Measure

The Metaphors Test (Barchard et al., 2011) is intended to measure emotion perception. The test contains ten metaphors, with three emotions each, for a total of 30 items. Participants are instructed to imagine that a person said each metaphor and then indicate the degree to which that person was expressing each of the emotions listed. An example is given in Figure 1.

Figure 1  
*Example Item from the Metaphors Test*

	Not at all	A little	Somewhat	A lot	Extreme
His face is a ray of sunshine.					
uplifted	1	2	3	4	5
embarrassed	1	2	3	4	5
admiration	1	2	3	4	5

The Metaphors Test is scored using proportion consensus scoring. In proportion consensus scoring, a score is given to each response according to the proportion of participants who give that response (MacCann, Roberts, Matthews, & Zeidner, 2004). For example, if 70% of participants choose “1”, 25% choose “2”, and 5% choose “3”, then “1” responses are given a score of .70, “2” a score of .25, and “3” a score of .05.

### Procedures

Participants completed the Metaphors Test as part of a larger study. The measures were completed online in two 90-minute testing sessions.

### Analysis

To test for sex differences on the Metaphors Test, we used an independent samples t-test. The grouping variable was sex and the dependent variable was the total score on the Metaphors Test.

### Results

Table 1 shows the descriptive statistics for men and women on the Metaphors Test. There was no significant difference between men and women,  $t(104) = -1.36, p = .18$ . However, women did obtain higher scores than men ( $d = .27$ ).

Table 1  
*Descriptive Statistics for the Metaphors Test*

Sex	Mean	Standard Deviation
Male	1.04	0.49
Female	1.17	0.48

### Discussion

The purpose of this study was to determine if the sex differences that are present on other tests of emotion perception are also present on the Metaphors Test. This study examined the discriminant validity of the Metaphors Test by comparing the total scores of men and women. In order to show that the Metaphors Test is valid in assessing emotion perception using verbal stimuli, we need to be able to show that both convergent validity and discriminant validity are supported. The Metaphors Test has strong convergent validity with the emotion perception branch of the MSCEIT; however, no research prior to this study has examined the discriminant validity of the Metaphors Test.

We found that women scored slightly higher on the Metaphors Test; however, this difference was not significant. This could be due to a lack of power. In order to have adequate power with a moderate effect size, 64 people are needed in each sample group (Cohen, 1992). Although the effect size in this study was small (.27), this is consistent with the effect size found on other tests of emotion perception. Thayer and Johnson (2000) found an effect size of .12 and the effect size we found was larger than that. Therefore, future research into a more detailed study of the discriminant validity of the Metaphors Test is warranted. Perhaps research into new tests of emotion perception, such as the Metaphors Test, will provide us with an enhanced understanding of how emotions are communicated.

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