

**Measuring Emotional Intelligence: Examining the  
Discriminant Validity of the Metaphors Test**  
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### Abstract

Emotional intelligence (EI) is important because it can be a good predictor of success in one's work, academic, and personal life (Mayer & Geher, 1996). The way we express and understand emotions is directly linked to our development of verbal skill (Wierzbicka, 2009) and people with a higher verbal skill are better able to express their emotions (Langer, 1967). The purpose of this study was to examine the discriminant validity of a new test of emotion perception. The Metaphors Test (Barchard et al., 2013) measures the ability to decipher the emotional connotations of written metaphors. A total of 181 participants (100 male, 81 female) completed this study online during a single 15-minute session as part of a larger study. The study materials were created using Qualtrics and distributed through Amazon Mechanical Turk (mTurk). Participants completed the Metaphors Test (a 30-item maximum performance test of the ability to perceive emotions in written stimuli) and a four-item self-report measure of verbal skill. To assess the discriminant validity of the Metaphors Test, we correlated it with verbal skill. There was a significant moderate correlation ( $r(179) = .30, p < .001$ ) between the Metaphors Test and verbal ability. This study had several limitations, including a subjective measure of verbal skill, a ceiling effect in the ratings of verbal skill, and a lack of diversity in participants. Despite these limitations, this study provides preliminary evidence for the discriminant validity of the Metaphors Test.

### Introduction

With the amount of written communication we use today, our ability to perceive emotion in text is important to maintaining healthy relationships (Byron, 2008). Psychologists have often divided general intelligence into various categories, one of them being emotional intelligence (EI). EI includes the ability to perceive emotions (Mayer, Caruso, & Salovey, 1999; Mayer & Geher, 1996). Measuring the ability to understand emotional connotations in verbal stimuli is one way to measure the ability to perceive emotions (Barchard, Hensley, Anderson & Walker, 2013). The purpose of this study is to examine the discriminant validity of the Metaphors Test (Barchard et al., 2013), which is a new test of ability to understand emotional connotations, by correlating it with self-reported verbal skill. We expect some correlation between verbal skill and EI because they are developmentally linked (Wierzbicka, 2009). Thus, we predict a small to moderate positive correlation.

Multiple tests have been created in an attempt to assess emotional intelligence. One of the best of these tests is the Mayer, Salovey, and Caruso Emotional Intelligence Test (MSCEIT; Mayer, Salovey & Caruso, 2002), which divides EI into four categories: facilitation, understanding, managing, and perception of emotions (Brackett & Mayer, 2003). Although the MSCEIT has proven a reliable and valid measure of EI (Brackett, Mayer, & Warner, 2004), it only measures the perception of emotions in nonverbal stimuli, such as facial expressions and pictures of landscapes (Brackett & Mayer, 2003). It is also important to test the ability to decipher the emotional connotations of written language. Metaphors are useful stimuli to use in such a test, because test takers must decipher the meaning of phrases and this involves some level of comprehension of

emotions (Barchard et al., 2013; Kövecses, 2000). The Metaphor Test (Barchard et al., 2013) is designed to make a distinction between high or low levels of emotional perception of an individual by covering a wide variety of emotions and by asking respondents to use scales to rate the extent to which each of several emotions is associated with a metaphor. The Metaphors Test attempts to improve the measurement of emotional perception, but this still leaves the issue of discriminant validity compared to verbal skill.

The process of understanding emotions is directly linked to the development of vocabulary (Wierzbicka, 2009). A well-developed vocabulary empowers an individual to better express their emotions (Langer, 1967). Individuals with a large working vocabulary have the ability to describe their emotions in increasingly complex ways (Lindquist, 2009). Gregory and Waggoner (1996) found that there was an age difference in metaphor comprehension and it could contribute to cognitive ability differences that come with age. Although Gregory and Waggoner's (1996) study showed that older and younger adults were equally accurate in identifying emotions, older adults used a more complex method of explaining their reasoning than their younger counterparts (Gregory & Waggoner, 1996). Because both verbal ability and metaphor comprehension are associated with age, they are also associated with each other. Thus, it is important to show the any new test of the ability to perceive the emotional connotations of metaphors is more than just a measure of verbal ability.

This study will attempt to give more understanding to the concept of EI by ensuring that emotion perception of verbal materials can be separated from the concept of verbal ability.

## **Method**

### **Participants**

A total of 181 participants (100 male and 81 female) participated in our study. Participants who completed the study received 10 cents. Their ages ranged from 20 to 68 years (mean 31.05, SD 10.83). Most participants identified themselves as Asian (78.5%), while the rest reported as follows: White (11.6%), Indian (4.5%), American Indian or Alaskan Native (3.3%), Black or African American (1.1%), and Other (1.2%).

### **Measures**

#### *Metaphors Test*

The Metaphors Test a 30-item maximum-performance test of the ability to perceive emotions in written stimuli. For each of the ten metaphors, three emotions are given (Barchard et al., 2013). Participants are asked to rate each of the three emotions (1= not at all, to 5= extreme) based on how they perceived the speaker of each metaphor would feel (Barchard et al., 2013). The Metaphors Test is scored using proportion consensus scoring, in which the participant's score is equal to the proportion of the norm group who gave that response (Barchard et al., 2013). For example, if 40% of the norm group chose response B, then B would be scored as .40 (Barchard et al., 2013).

#### *Verbal Skill*

The participants were given a four-item questionnaire asking them to rate their comfort reading, writing, listening, and speaking English, using a 10-point scale.

### **Procedure**

The study took approximately 15 minutes to complete and was administered online as part of a larger study. The online materials for this study were created using Qualtrics. Qualtrics is online computer software that researchers use to produce surveys. The survey was distributed through Amazon Mechanical Turk (mTurk): a website that connects people who want work done (called requesters) with people who want to do the work (called workers). Requesters advertise tasks (called Human Intelligence Tasks) that can be completed for compensation. Typically, compensation is minimal. mTurk is frequently used to advertise psychological studies (Buhrmester, Kwang & Gosling, 2011). In this study, participants received a validation code in Qualtrics. Participants entered the validation code into mTurk in order to receive credit for 10 cents.

### **Data Analysis**

To measure the discriminant validity of the Metaphors Test, we correlated the total score of verbal skill with the total score of the Metaphors Test.

## Results

We found a significant moderate correlation between the Metaphors Test and verbal skill ( $r(179) = .30$ ,  $p < .001$ ). Despite the fact that the correlation was significant, there were some participants who scored low on the Metaphors Test and reported their verbal skill as being high, and there was also an outlier where a participant scored high on the Metaphors Test but reported their verbal skill as low. A scatter plot of the data is shown below (see Figure 1).

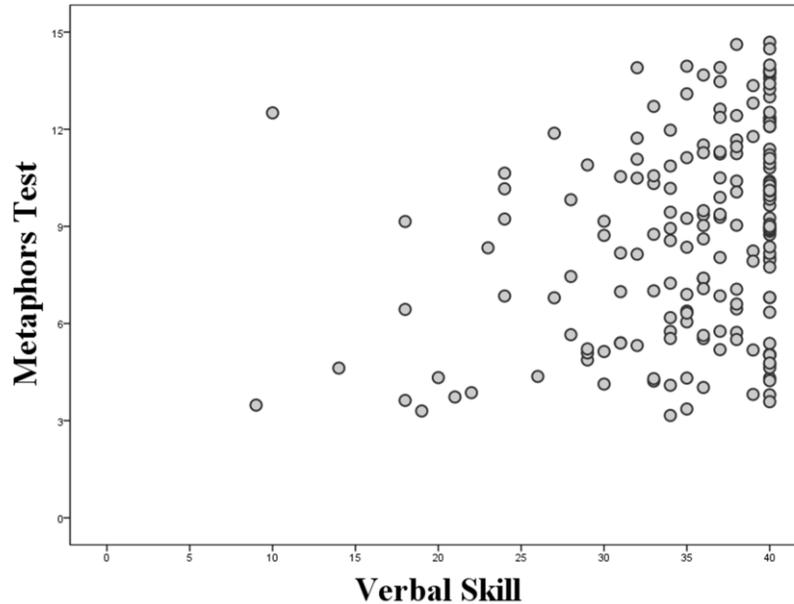


Figure 1. Correlation between the Metaphors Test and verbal skill.

## Discussion

The purpose of this study was to examine the discriminant validity of the Metaphors Test compared to verbal skill. As expected, a moderate correlation ( $r(179) = .30$ ) was discovered between the Metaphors Test and verbal skill, thus showing the discriminate validity of the Metaphors Test (Barchard et al., 2013). This corresponds with previous research which stated that verbal skill is important for understanding the denoted meaning of words, and that the Metaphors Test measures perception of emotional connotations (Barchard et al., 2013). If the correlation was much stronger, this would suggest that the Metaphors Test is merely a vocabulary test and not a measure of perception of emotion.

There were several limitations to our study. The correlation may have been reduced by two factors. First, this study used a self-report measure of verbal ability. Because of this, some participants may have overestimated their skill. In addition, one participant scored high on the Metaphors Test but reported low verbal skill. Perhaps this participant was comparing himself to a different reference group than the other participants used. Second, the test of verbal skill had a ceiling effect. Many participants reported that they had excellent verbal skill on all four items and thus obtained the maximum possible score. In particular, several participants scored low on the Metaphors Test but reported themselves as having high verbal skill. Future research should use a more maximum-performance test of verbal skill and ensure it is difficult enough to avoid a ceiling effect. This will provide a more accurate measure of verbal ability, and thus allow a better assessment of discriminant validity.

Another limitation of our study was our sample. A majority (78.5%) of the participants report that they were of Asian ethnicity. This limits our ability to generalize our study results to other groups. Future research should also try to obtain a more varied demographic. Including a wider range of ethnicities could improve the generalizability of the study results.

Despite these limitations, this study provides preliminary evidence for the discriminant validity of the Metaphors Test. The ability to perceive the emotional connotations of written language is more important than ever, given how often we use written words to talk with friends, family, and work associates. Further research on the usefulness of the Metaphors Test is warranted.

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