

“Looking Up” and “Feeling Down”: Measuring Emotion Perception in Language

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Abstract

Today, social success requires the ability to decipher the emotional connotations of written language, such as emails, blogs, and Facebook pages. Two tests have been designed to measure this ability: the Metaphors Test (Barchard, Anderson, Hensley, & Walker, 2011) and Gregory and Waggoner’s test (1996). Both use atheoretical test stimuli, making it impossible to create scoring keys before data were collected. Therefore, items were scored using consensus scoring, in which the score is based on the proportion of the norm group who gave each possible response. Consensus scoring has several problems (Barchard, Hensley, & Anderson, 2011; Barchard & Russell, 2006; Maul, 2011). These problems can be avoided by using established psychological theory to create test stimuli and scoring keys.

We therefore wanted to design a new test of the ability to perceive emotions in language, where the items and scoring key are based upon established theory. Theory does not allow us to determine the emotional connotations of arbitrary stimuli: Are “car” and “pebble” happy? Angry? Theory does not tell us. Instead, we had to start from the emotion and then find the stimuli. Specifically, we used research on conceptual metaphors to find stimuli with known emotional connotations. A conceptual metaphor involves two concepts, in which one concept (the source) provides information about the other (the target) (Lakoff & Johnson, 1980). For example,

“Happiness is up” is a conceptual metaphor in which “up” provides information about “happiness.” Conceptual metaphors are the basis for much of what we say about emotions: When someone is sad, we say they are “down” or “blue” (Shweder, 1991), and when someone is angry, we say they are “boiling” or “hot-headed” (Lakoff & Johnson, 1980; Shweder, 1991). We derived a list of conceptual metaphors for each of four emotions: anger, sadness, fear, and happiness. Next, we created stimuli that were associated with each of those sources. For example, happy is “up” and “balloons” are up, and so balloons are happy. The purpose of this paper is to share the Measure of Emotional Connotations with other researchers and to solicit feedback on its format and content.

Introduction

Our social world is increasingly dependent on text-based media such as email, text messaging, and social networking sites such as Facebook. Individuals often misinterpret emails or text messages and may perceive them as more negative than they were intended (Byron, 2008). People need to perceive emotions accurately, even when they do not have access to traditional non-verbal cues, such as tone of voice, posture, and facial expressions. Therefore, we want to design a measure of the ability to perceive the emotional connotations of language.

Language contains both denotative and connotative information (Lyons, 1977). Denotative information is the type of information one would find in the dictionary, or information that is literally expressed by the words themselves. Connotative information is information that is implied, and may include emotional content. For example, when people say, “I feel down,” they are using connotations to express the emotion of sadness. Several tests exist to measure the ability to decipher the emotional meanings of language. Some of these tests are influenced by both denotative and connotative information. For example, the Mayer-Salovey-Caruso Emotional Intelligence Test Changes task (Mayer, Salovey, &

Table 1
Conceptual Metaphors for Emotions

Happiness is up “We had to cheer him up.”	Barcelona (2000), Chen (2010), Kovecses (1991), Kovecses (2005), Lakoff & Johnson (1980), Li (2008), Ruben (1985), Strauss & Allen (2008), Waggoner & Palermo (1991), Yu (1995)
Happiness is bright “Look on the bright side.”	Deignan (2005), Kovecses (1991), Kovecses (2005), Kovecses (2008), Lakoff & Johnson (1980), Li (2010), Strauss & Allen (2008), Yu (1995)
Sadness is down “I’m feeling down.”	Barcelona (1997), Barcelona (2003), Dor-Shav & Dor-Shav (1978), Hong-mei (2010), Kövecses, Benczes, & Csábi (2009), Lakoff & Johnson (1980), Luodonpää-Manni & Viimaranta (2010), Pritzker (2003), Shweder (1991), Tolass (1991), Waggoner & Palermo (1991), Yu (1998)
Sadness is dark “I’m in a dark mood.”	Barcelona (2003), Hong-Mei (2010), Kovecses (1998), Pritzker (2003), Tao, Tan, & Picard (2005)
Sadness is empty “My life is empty.”	Kaviani & Hamed (2011), Shweder (1991)
Fear is cold “My blood ran cold.”	Apresjan (1997), Dobrovol’skiĭ, Dobrovol’skij, & Piirainen (2005), Dor-Shav & Dor-Shav (1978), Kovecses (1990), Omori (2008), Yu (2002)
Fear is the inability to move “I was paralyzed by fear.”	Apresjan (1997), Kovecses (1990), Maalej (2007), Strugielska & Alonso-Alonso (2005)
Anger is hot “He was hot-headed.”	Dor-Shav & Dor-Shav (1978), Gibbs (1994), Kovecses (1990), Kovecses (2000), Kovecses (2005), Lakoff & Kovecses (1986), Matsuki (1995), Munro (1991), Waggoner (2010), Yu (1995)
Anger is red “She was scarlet with rage.”	Kovecses (1995), Kovecses (2005), Lakoff & Kovecses (1986), Matsuki (1995), Mikolajczuk (1998), Waggoner & Palermo (1989), Yu (1995)

figurative phrases: For example: “We had to cheer him up,” “Lighten up” (Kovecses, 1986), “I’m feeling up,” and “That boosted my spirits” (Lakoff & Johnson, 1980).

We wanted to focus upon conceptual metaphors for each emotion that are used in multiple cultures. This way, if our test is translated into other languages, the veridical scoring key is more likely to still be valid. Many metaphors for each emotion

Figure 1
Sentences

Select the emotion that is conveyed by each of the following sentences.

	Happiness	Sadness	Fear	Anger
The brilliant rays of the rising sun shone brightly through the sparkling rainbow.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The bitter cold wind blew through the icy cave, shaking the frigid icicles.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The empty locket sunk into the dark abyss.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
The kettle screamed red over the roaring flames.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Figure 2
Two-word Phrases

Select the emotion that is conveyed by each of the following phrases.

	Happiness	Sadness	Fear	Anger
Bright sunrise	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Empty abyss	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Immobilizing chills	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Boiling blood	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Caruso, 2002) and the Multifactor Emotional Intelligence Scale Stories task (Mayer, Caruso, & Salovey, 2000) both include explicit emotion words in the item stems.

Creating Test Items

The purpose of the current paper was to design a test of the ability to decipher the emotional connotations of language. We used previous empirical research to inform the creation of the test stimuli so that a veridical scoring key could be created, and so that the items could potentially be translated into other languages and still be valid.

Figurative language is well suited to express emotional experiences for two reasons. First, figurative language is used to communicate ideas that cannot be captured by literal language (Fainsilber & Ortony, 1987). For example, someone might say, “Love is a whirlwind of rose petals.” Second, figurative language can be used to capture the vividness of an experience that otherwise would be difficult or impossible to describe (Fainsilber & Ortony, 1987). An example of this can be found in times of intense stress: an individual might say, “I felt like the world was falling down around me.”

Thus, the first step was to find well-established conceptual metaphors for emotions. A conceptual metaphor is an idea that involves two concepts in which one concept displays a certain aspect about the concept of interest (Lakoff & Johnson, 1980). For example, “Happiness is up” is a conceptual metaphor in which the concept of “up” displays information about the concept of “happiness.” Conceptual metaphors are the foundation for many other metaphors and

are used across cultures worldwide. One reason for this is that our bodily experience structures our cognitive activity: mental functioning is often explained in terms of bodily functioning, such as “that man is sick in the head” (Fesmire, 1994). In addition, different cultures may have similar emotion metaphors because emotional experiences have typical physiological reactions (Kovecses, 2005). For example, when people are happy, they tend to be more active, and may either jump up and down or move around more than usual. In contrast, when people are sad, they tend to be inactive and have downwards posture. Given the large number of conceptual metaphors, we decided to limit test stimuli to ones that are congruent with conceptual metaphors that have been established across multiple cultures. Combining the results of our analyses, we found cross-cultural support for 9 conceptual metaphors, which are listed in Table 1.

Our Item Formats

All items ask respondents to match verbal stimuli to one of four emotions: anger, sadness, fear, and happiness. To avoid invoking non-perceptual skills, certain types of content were avoided. Specifically...

- Stimuli are realistic descriptions rather than metaphorical. We avoided “echoing footprints.”
- Stimuli involve no people or animals. We avoided “leaping kitten.”
- Stimuli do not describe the appearance of people or animals. We avoided “flushed face.”
- Stimuli do not include actions and behaviors that are closely associated with specific emotions. We avoided “Smiling sun” and “crying statue.”
- Stimuli do not describe situations that would cause the emotions. We avoided “echoing footsteps.”
- Stimuli include no explicit emotion words. We avoided “furious volcano.”

We have created four item formats.

- Figure 1 shows the Sentences format. The sentences were loaded as heavily as possible with the conceptual metaphors.
- Figure 2 shows the Two-Word Phrases format. Each of the two words was loaded with the conceptual metaphors.
- Figure 3 shows the Imagine Yourself As... format. It uses the same types of stimuli as the Two-Word Phrases format. The purpose of using this format is to force a particular perspective upon the reader.
- Figure 4 shows the Choose between Two-Word Phrases format. Each item includes four phrases: one for each of the four emotions.

Figure 3
Imagine Yourself As...

	Happiness	Sadness	Fear	Anger
Imagine yourself as radiant fireworks.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How do you feel?				
Imagine yourself as a dark void.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How do you feel?				
Imagine yourself as a frigid icicle.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How do you feel?				
Imagine yourself as a hissing volcano.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
How do you feel?				

Figure 4
Choose between Two-Word Phrases

- | | |
|--|---|
| A person feels sad. The person feels like... | A person feels angry. The person feels like... |
| <input type="checkbox"/> a dazzling rainbow | <input type="checkbox"/> a floating bubble |
| <input type="checkbox"/> a smoldering fuse | <input type="checkbox"/> a roaring flame |
| <input type="checkbox"/> a deflated balloon | <input type="checkbox"/> empty footprints |
| <input type="checkbox"/> a bound puppet | <input type="checkbox"/> a freezing cage |
| A person feels scared. The person feels like... | A person feels happy. The person feels like... |
| <input type="checkbox"/> a beaming sun | <input type="checkbox"/> a zooming kite |
| <input type="checkbox"/> a blazing furnace | <input type="checkbox"/> a scarlet kettle |
| <input type="checkbox"/> a drooping flower | <input type="checkbox"/> a barren ocean |
| <input type="checkbox"/> a locked freezer | <input type="checkbox"/> a frozen leaf |

