

**The world of emotion is two-dimensional,  
.. or is it?**

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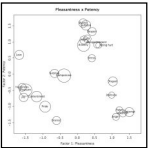
**The “Grid Study” is about assessing the semantic  
space of affect labels across languages.**



*> Dissecting the elephant, or  
the “Curse of the Blinkers”*



*> The “Grid Study”*



*> Results*

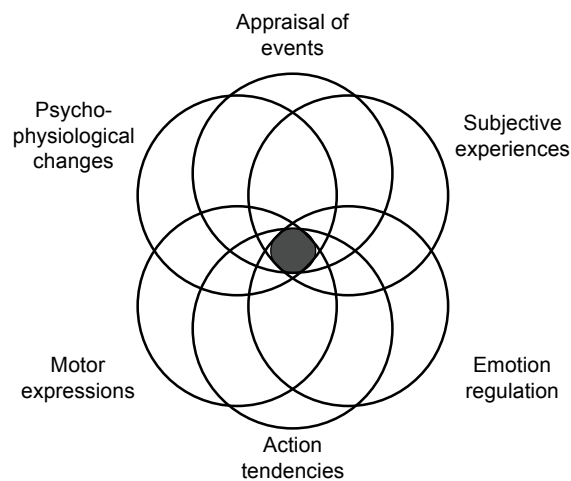
## More than meets the eye: the allegory of the blind men and the elephant.

Katsushika Hojusai (1760–1849)



- Many perspectives can be applied to the study of emotions
- Should we dissect the elephant?
- What model for what purpose?
- Beware of the **Curse of the Blinkers!**

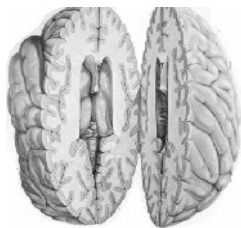
## The construct of an emotion that researchers describe can be divided into components.



**Very different models focus on very different phenomena.**

PHASE COMPONENTS	Low-level evaluation	High-level evaluation	Goal/need priority setting	Examining action alternatives	Behavior preparation	Behavior execution	Communication - Sharing with others
Cognitive							
Physiological	Adaptational models						
Expressive		Appraisal models	Motivational models			Circuit & Discrete Emotion models	
Motivational							Meaning & Construct models
Feeling	Dimensional models						

**Dimensional models play an important role in both empirical and applied emotion research.**



e.g., Davidson, & Irwin (1999)  
Gray (1994)

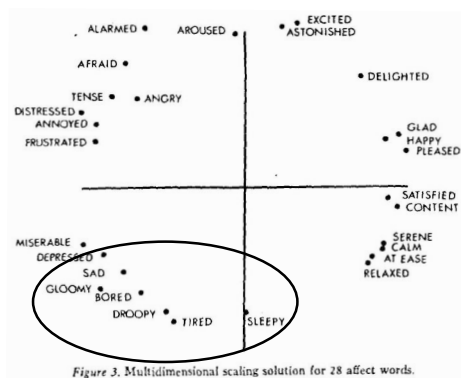
- Represent emotional constructs in low-dimensional spaces
- **Conceptual economy**
  - Psychology, Cognitive Neuroscience
  - Clinical settings
  - Affective Computing (e.g., Max)
    - modeling
    - sensing
    - expressing

**Since Day 1, scientists have been trying to define the boundaries of the emotional space.**

- Osgood, May, & Miron (1975)  
Russel, & Mehrabian (1977)  
Evaluation, Activation, **Dominance**  
(*semantic differential*)
- Russell (1978, 1980)  
**Circumplex Model of Affect**  
Pleasure/Displeasure, Arousal  
(*similarity sorting*)
- Russell et al. (1989)  
Cross-cultural replication
- Russell, & Feldman-Barrett (1999)  
**Integrative review: Valence, Arousal**



**Russell (1980) introduces the Circumplex Model of Affect.**



- Similarity sorting of 28 emotion words
- Claim 1: Structures affective experience
- Claim 2: Represents the cognitive structure underlying affect

## Russell (1983) replicates the finding in several cultures.

- Japanese
- Gujarati
- Unilingual Chinese
- Bilingual Chinese
- Unilingual Croatian
- Bilingual Croatian

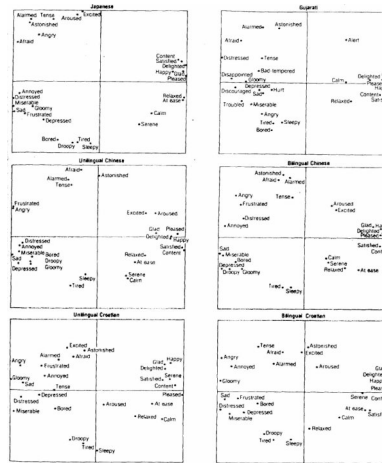


Figure 2. Two-dimensional scaling solutions for emotion-related words in Gujarati, Croatian, Japanese, and Chinese.

## Russell, Lewicka, & Niit (1989) reiterate, and extend the model to prototypical facial expressions.

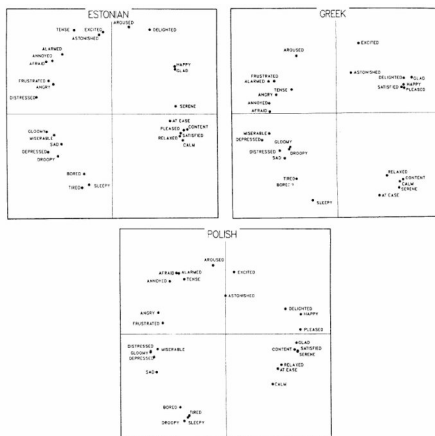
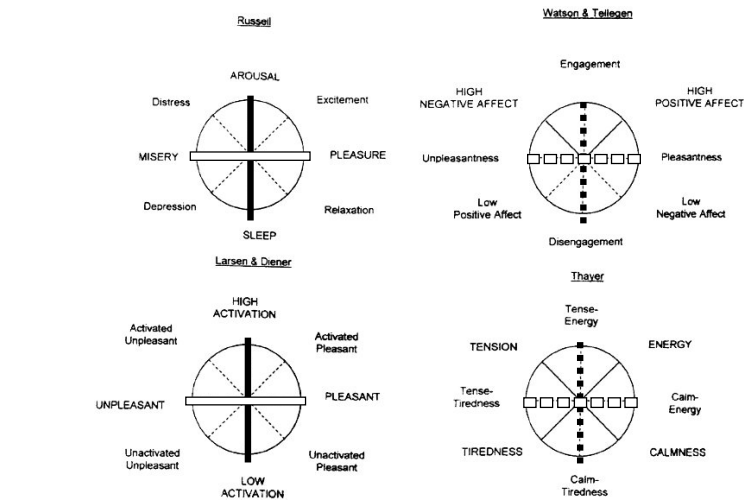


Figure 2. Two-dimensional scaling solutions for 28 words.

- Similarity sorting
  - same 28 emotion words
  - 10 prototypical facial expressions
- Only Valence and Arousal are stable within and across cultures
- Dominance has disappeared!

**The Valence–Arousal model is an integrative model  
(Russell, & Feldman-Barrett, 1999 – *Dissecting the Elephant*)**



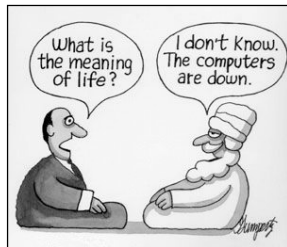
**.. or is it?**

- Inconsistent findings
  - Pleasantness–Arousal
  - Pleasantness–**Dominance** (e.g., Gehm, & Scherer, 1988)
  - Pleasantness–Arousal–**Dominance** (e.g., Corralize, 1987)
  - Calmness/Tension–Alertness/Sleepiness (e.g., Thayer, 1996)
- Even in cross-cultural settings
  - Shaver, Schwartz, et al. (1987, 1992)
  - Fontaine et al. (1992; 2001, 2006)  
The Leuven Emotion Scale  
Similarity sorting + Frequency of experience  
Valence–Potency (**no Arousal!!**)





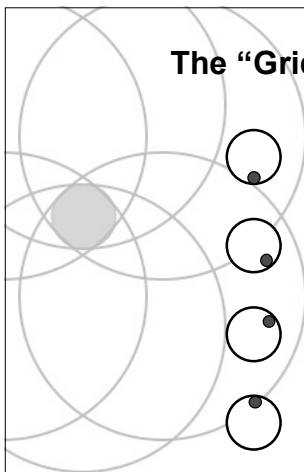
## Does denotation meet connotation? What is the implicit meaning commonly inferred by emotion words?









**H1** – Prototypical emotion words refer to coordinated **changes in most or all of the emotion components**

**H2** – Due to interdependencies, the variability in the emotion components **can be represented in low-dimensional spaces**

## The “Grid Study” fully represents all components.

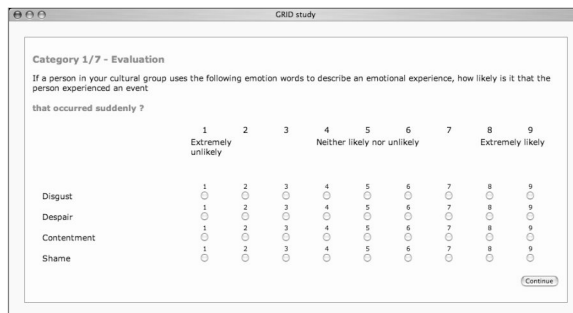


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 Appraisal of events – 31 emotion features  
 Scherer (2001) + Markus, Kitayama (1991) + Lazarus (1991)
- 
 Psycho-physiological changes – 18 emotion features  
 Sympathetic system + Parasympathetic system
- 
 Motor expressions (face, voice, gesture) – 26 emotion features  
 Scherer, Wallbot, & Summerfield (1986)
- 
 Action tendencies – 40 emotion features  
 Frijda (1989)
- 
 Emotion regulation – 7 emotion features  
 Ekman, & Friesen (1969)
- 
 Subjective experiences (feeling) – 20 emotion features  
 Yik et al. (1999) + Scherer (2005) + Thayer (1996) + Stever et al. (1994)

**We applied the Grid to a sample of emotion words used both in daily life, and by emotion scientists specifically.**

- “Often used in emotion research” (12)  
Anger, Contempt, Disgust, Fear, Guilt, Interest, Joy, Pleasure, Pride, Sadness, Shame, Surprise
- “Reported with some frequency in large scale studies” (8)  
Anxiety, Compassion, Contentment, Despair, Disappointment, Happiness, Irritation, Stress
- “Explicitly interpersonal” (4)  
Being hurt, Jealousy, Hate, Love

**The first run allowed us to compare Belgian (N=198), English (N=188), and French (N=145).**



Category 1/7 - Evaluation

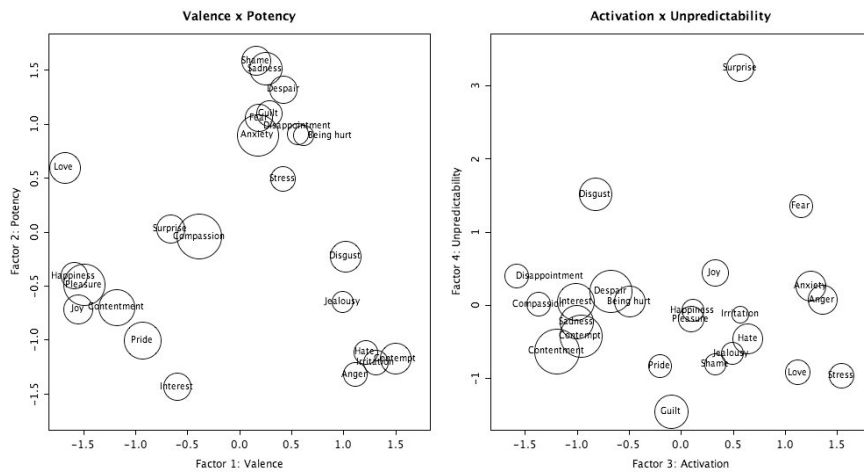
If a person in your cultural group uses the following emotion words to describe an emotional experience, how likely is it that the person experienced an event that occurred suddenly?

	1	2	3	4	5	6	7	8	9
	Extremely unlikely			Neither likely nor unlikely			Extremely likely		
Disgust	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Despair	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Contentment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Shame	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

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- Web-based instrument hosted in Swiss Centre of Affective Sciences
- 4 emotion words / part. (random)
- 1 hour
- Likelihood that each emotion feature is related to the emotion word

## Principal Component Analysis onto the profiles within and across the three languages showed 4 dimensions.



## These results confirm both of our hypothesis.

- We found a **reliable** and **replicable** structure across the languages *therefore*,

Emotion words refer to coordinated changes in the components

✓ H1

- Changes in one component are strongly and coherently related to changes in the other components

leading to a straightforward four-factorial structure

✓ H2

## Finally, here comes the take home message ..

"Remember"



- **The Curse of the Blinkers**  
A two-dimensional model is biasing
- We found a highly replicable structure between three western languages:
  1. Valence
  2. **Potency**
  3. Arousal
  4. **Unpredictability**
- Most importantly, we now have a means to tap the very features that constitute the dimensions

Thank you very much  
for your attention!

