HARVARD
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Emotions as universal units?

Are emotions like elements or compounds?

Psychology 1702
The Emotional Mind

Today's agenda

- Do all of our minds have the same set of basic emotions?
- Categories and dimensions of emotions

Announcements

- Final reminder: *Inside Out* - watch it + read associated media articles
  - Thought questions & media articles are posted on Week 2 module

"Basic" emotion theory

- The human mind has been endowed with a small set of emotions that we have an innate, core understanding of.

Evidence generated from:

- **Universally expressed & recognized**
- No experience necessary

www.youtube.com/watch?v=h19PzyqOxxo

1971 study procedure

- Scenario paired with three different expressions. Choose the one to best match the story.
- (Chance = 33%)

Scenario used	Intended emotion	% agreement
His (her) friends have come, and he (she) is happy.	Happy	92%
His (her) child (mother) has died, and he (she) feels very sad	Sad	81%
He (she) is angry; or he (she) is angry, about to fight.	Anger	87%
He (she) is looking at something he (she) dislikes; or He (she) is looking at something which smells bad.	Disgust	83%
He (she) is just now looking at something new and unexpected.	Surprise	68%
He (she) is sitting in his (her) house all alone, and there is no one else in the village. There is no knife, axe, or bow and arrow in the house. A wild pig is standing in the door of the house, and the man (woman) is looking at the pig and is very afraid of it. The pig has been standing in the doorway for a few minutes, and the person is looking at it very afraid, and the pig won't move away from the door, and he (she) is afraid the pig will bite him (her).	Fear	64%

1971 study procedure

- Scenario paired with three different expressions. Choose the one to best match the story.
- (Chance = 33%)

Scenario used	I e
His (her) friends have come, and he (she) is happy.	
His (her) child (mother) has died, and he (she) feels very sad	
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He (she) is looking at something he (she) dislikes; or He (she) is looking at something which smells bad.	
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Ekman's conclusion

"The results provide evidence in support of the hypothesis that the association between particular facial muscular patterns and discrete emotions is universal."

Ekman & Friesen,1971

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David Matsumoto

- 1980s to today
- Expert in nonverbal expression
- Role of prior experience in emotional expression.
- Judo aficionado

Spontaneous expressions in congenitally blind people

Spontaneous expressions in congenitally blind people

(c) David Matsumoto 2009

Matsumoto et al., 2009

Judo

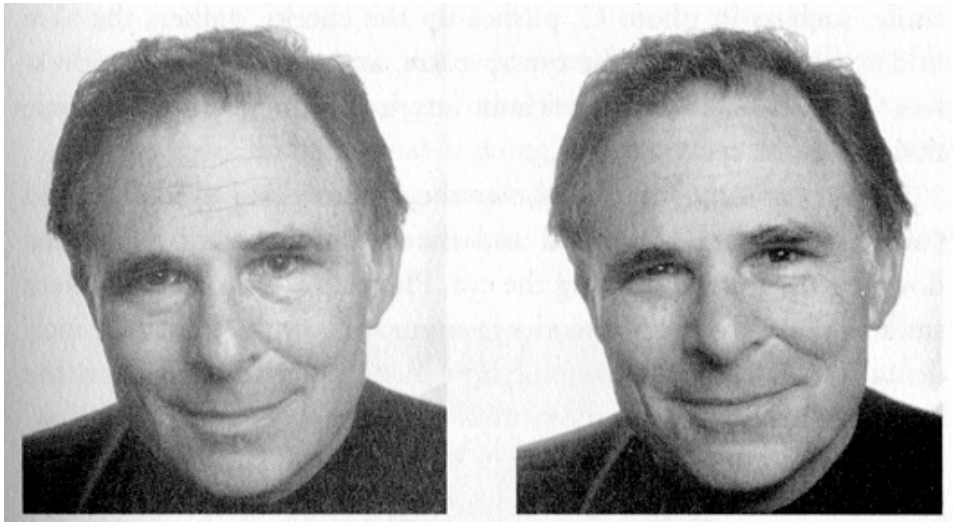
- Gold = won
- Silver = lost
- Bronze = won

Expressions on the medal stand

Gold & Bronze vs Silver & no medal

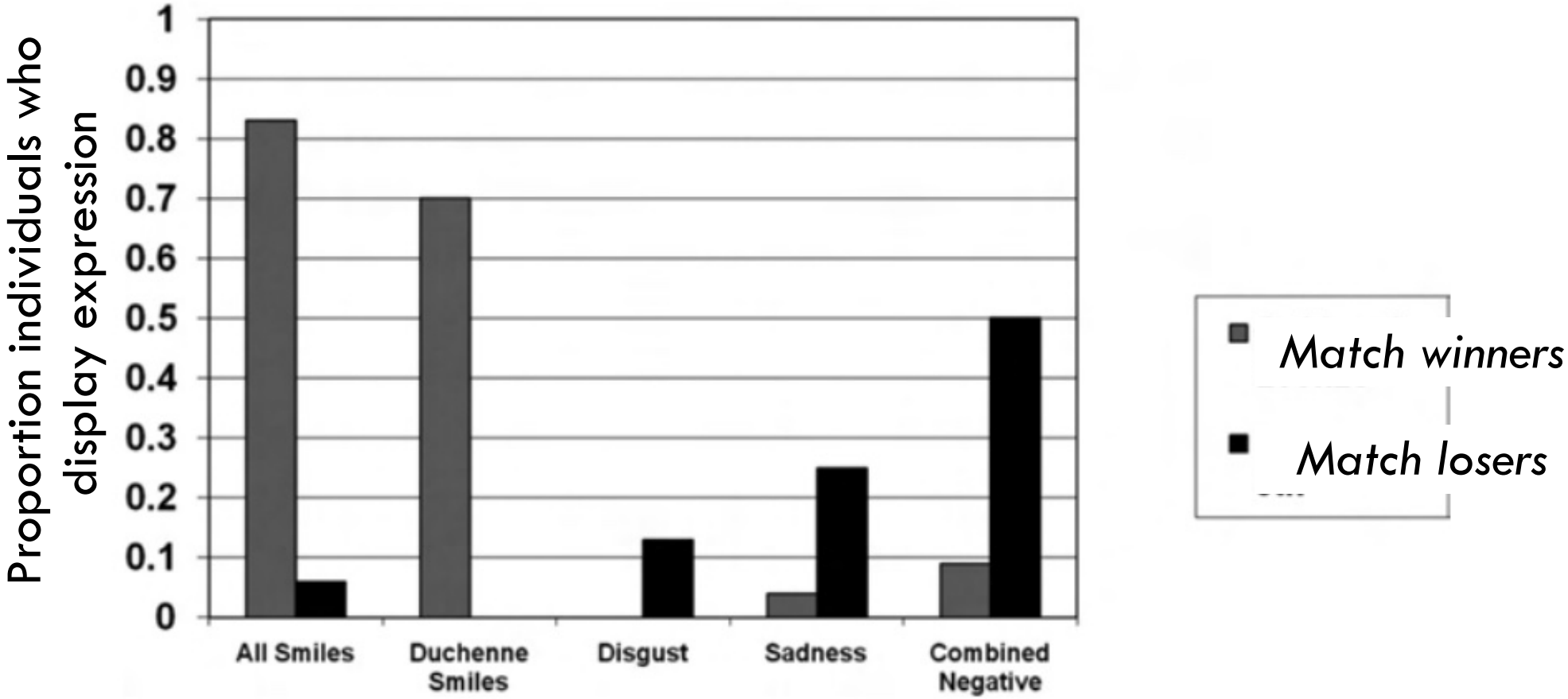
1. Sighted
2. Congenitally blind
3. Noncongenitally blind

- All three groups demonstrated statistically comparable frequency of spontaneous expression after the match and on the medal stand.
    - Cannot be explained by overall differences in facial activity.
- Did their expressions 'match' their place-finish?



Disgust
Sadness
"General negative"
Duchenne smiles
Non-duchenne smiles

Expressed emotion at moment of winning match
Congenitally blind



Matsumoto et al., 2009

- "[Our findings] strongly suggest that the universality in emotional expression observed in numerous studies involving adult humans originates from an evolved, potentially genetic source and that all humans, regardless of gender or culture, are born with this ability."
- "We come to this conclusion because the blind athletes, especially those born blind, could not possibly have learned to produce those exact facial configurations from modeling the expressions of others…"

Matsumoto & Willingham, 2009

"Basic" emotion theory

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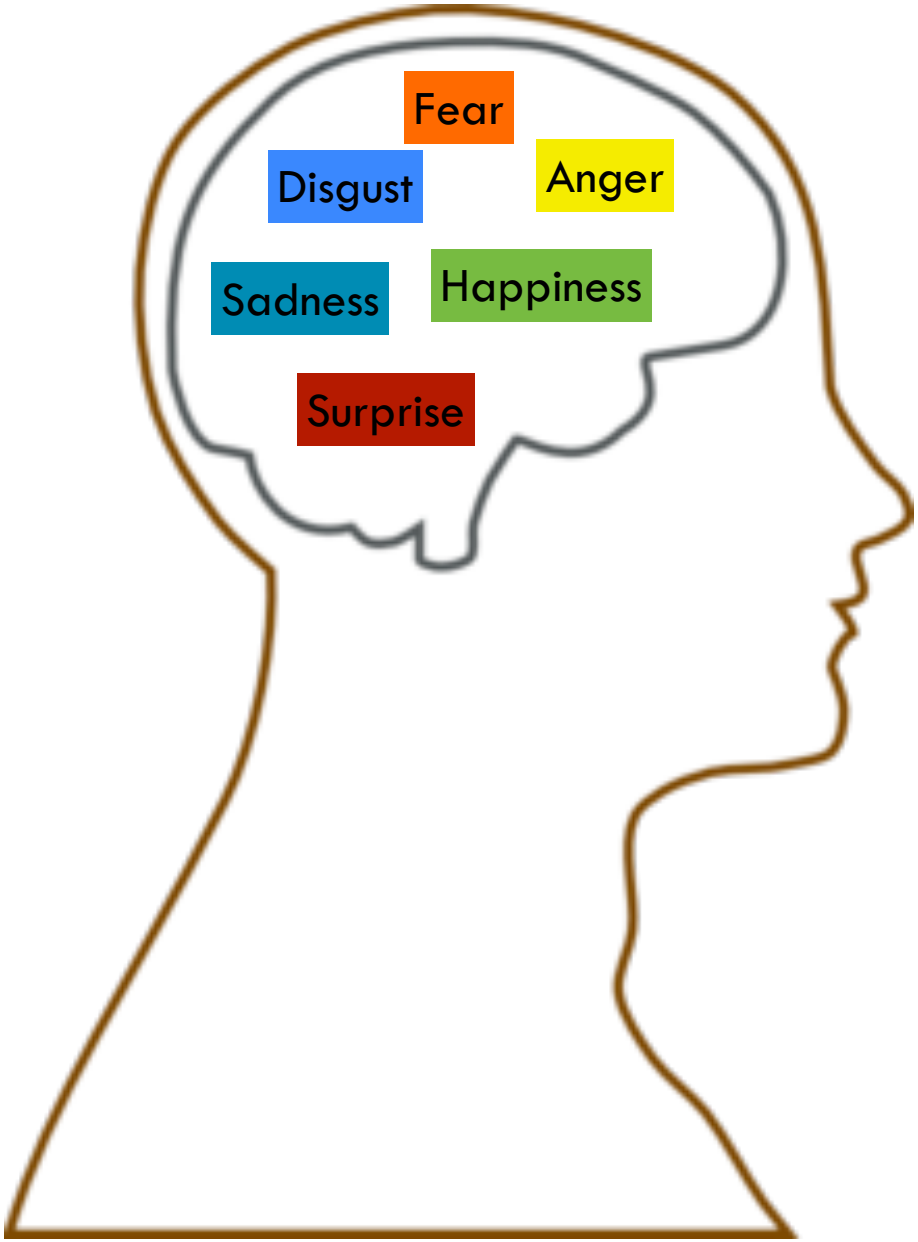
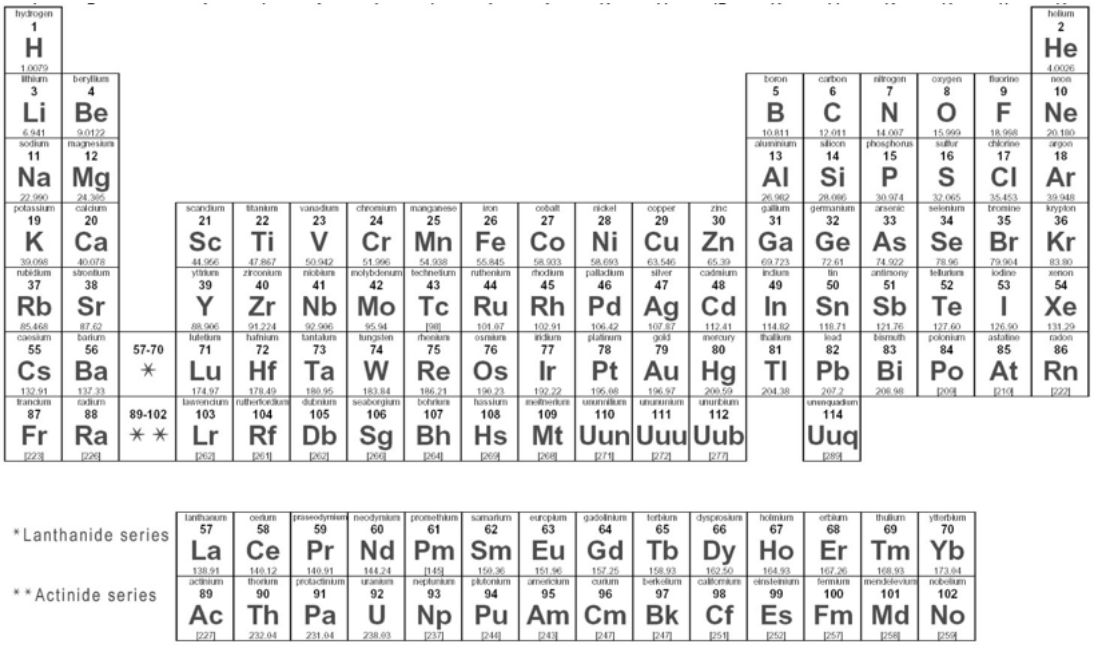
Basic emotion theory



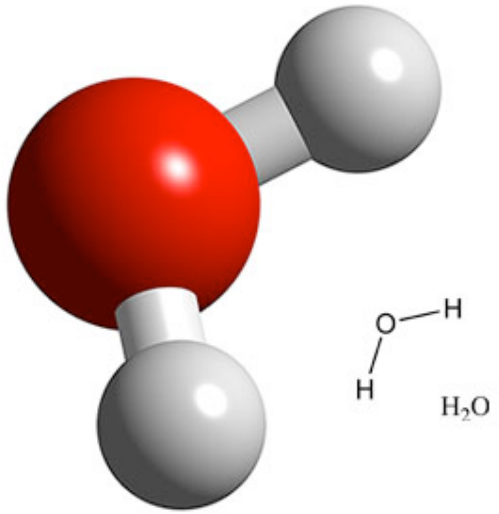
Emotions as packages or 'affect programs'

- Similar within a category
- Distinct from one another



Basic emotion theory is consistent with the view that emotions are 'elemental' in the mind

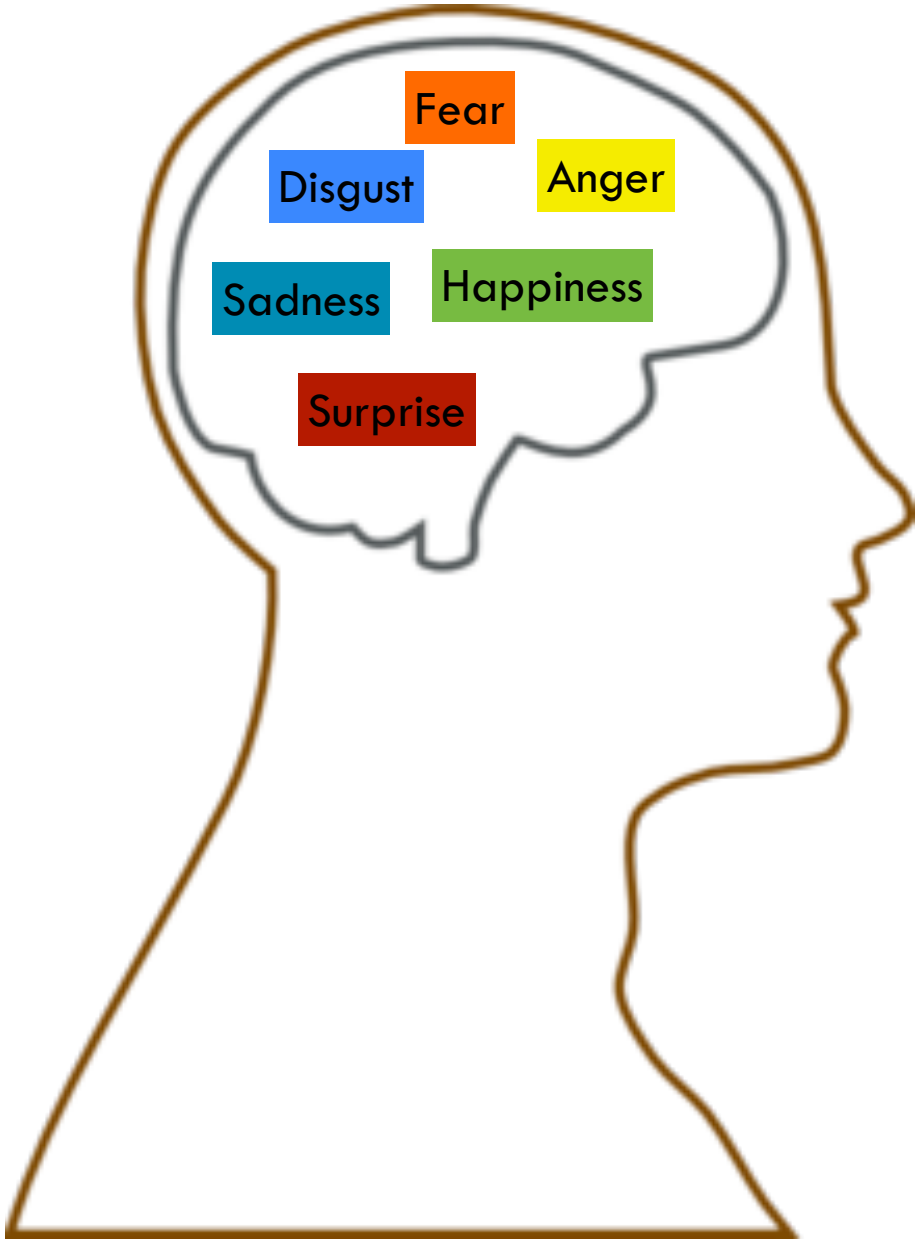
- Irreducible
- Categorical



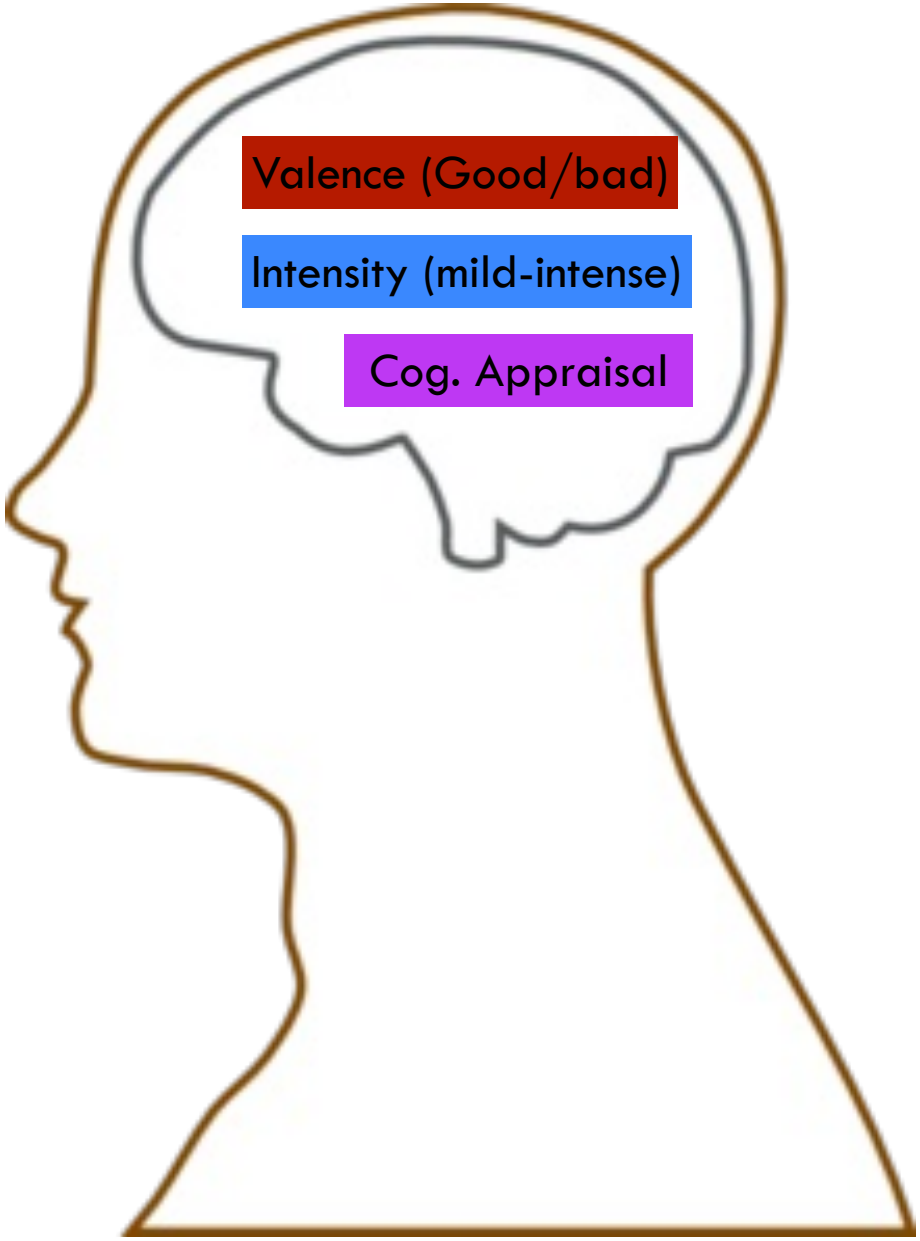
Or are all emotions like 'compounds' - made up of *more* elemental mental events?

- Reducible
- Flexible

Basic emotion theory

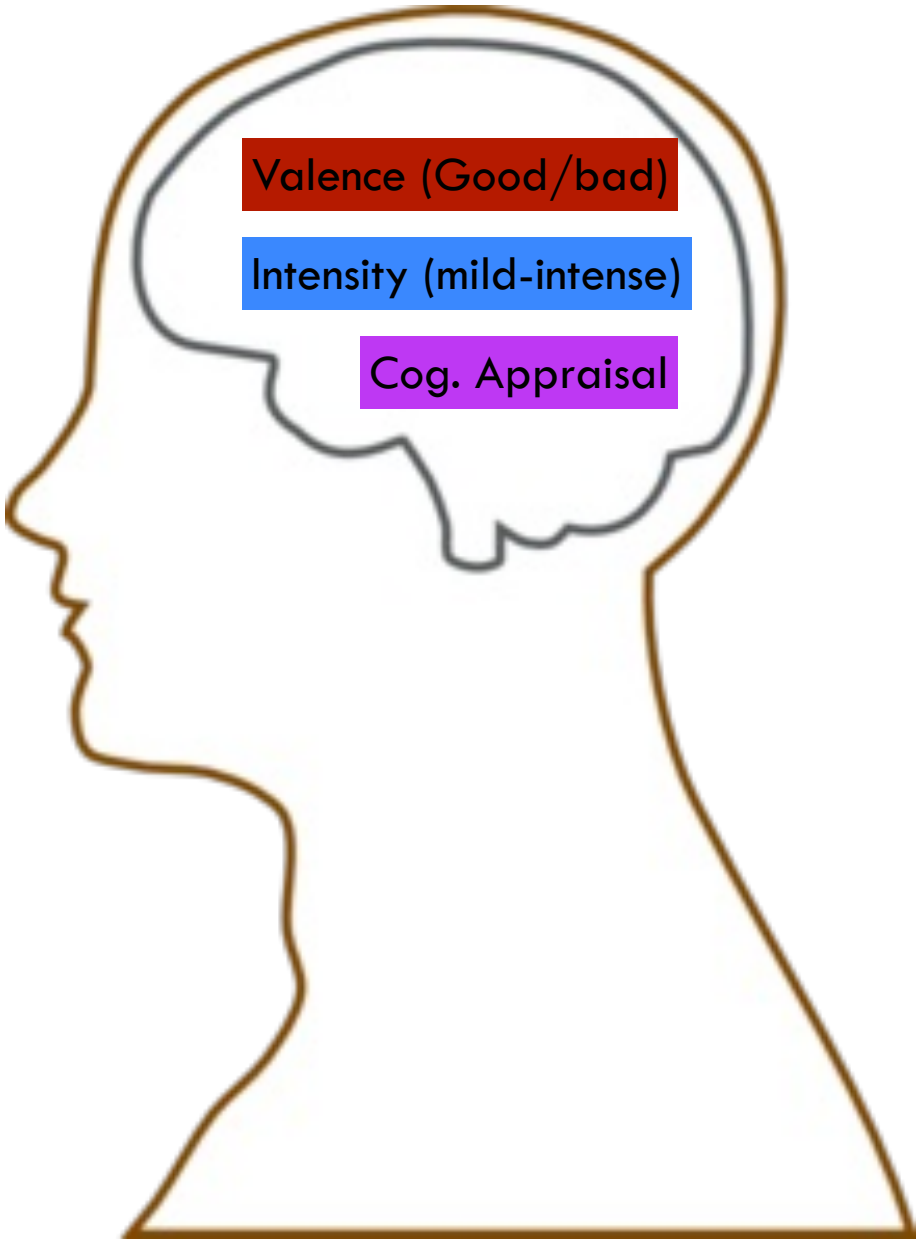


Constructed emotion theory



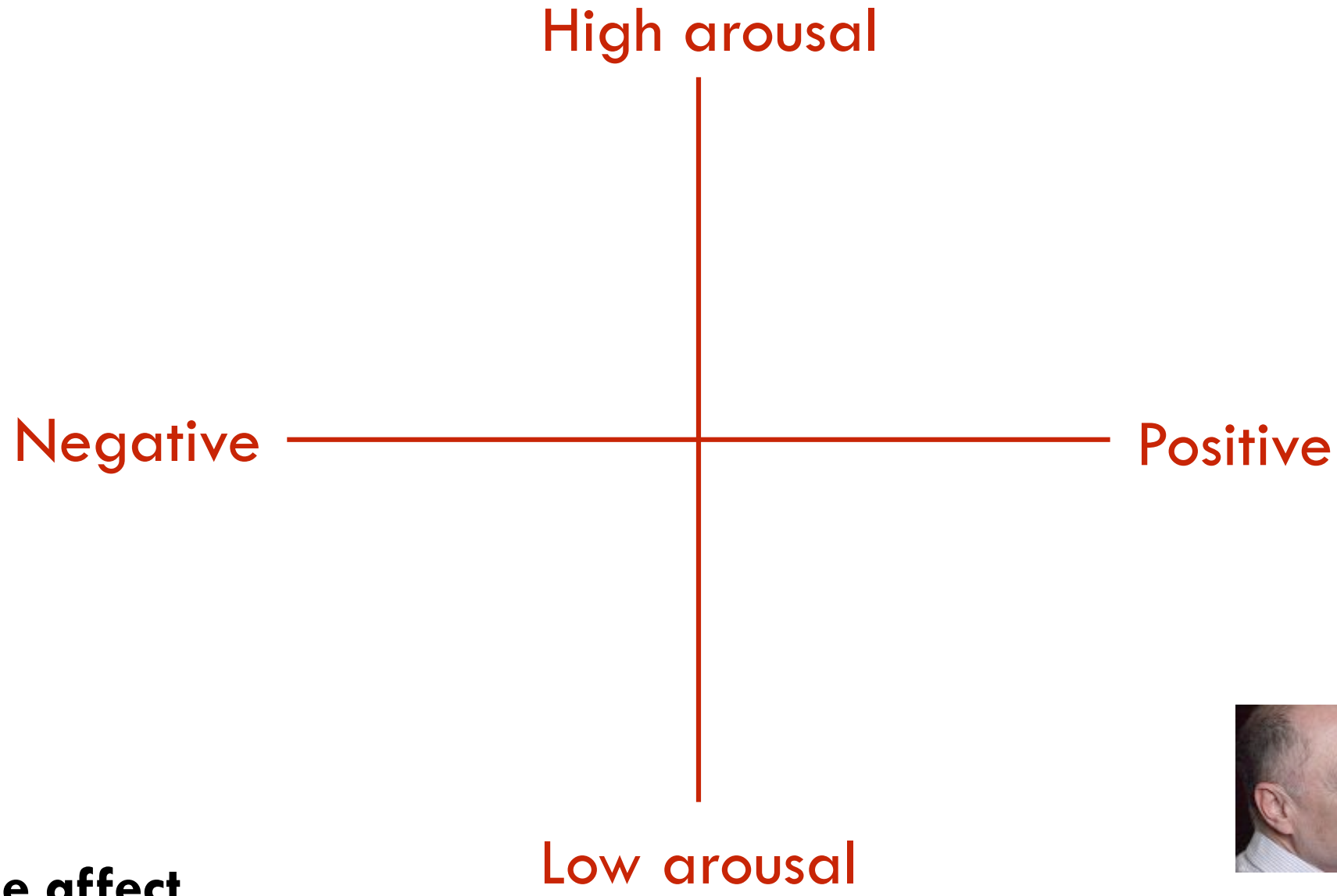
- The mind represents our emotional states based on a combination of 3 factors:
  - Valence
  - Intensity
  - Appraisal

- *Different emotions need not have categorical distinctiveness*



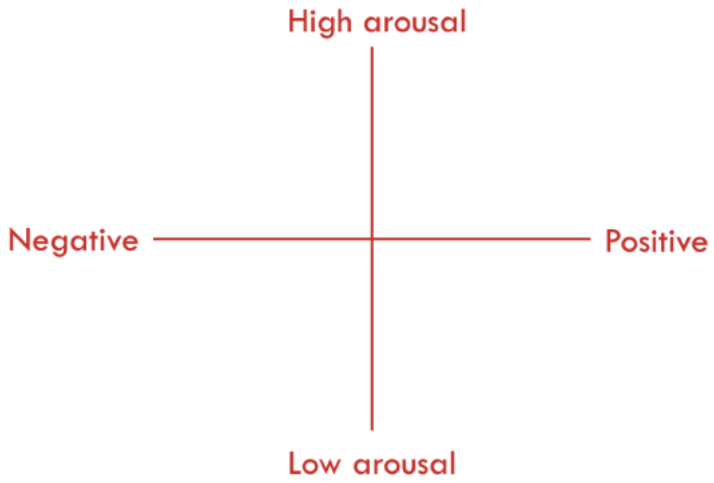
Affective circumplex

Our affective states are a combination of two dimensions: arousal and valence



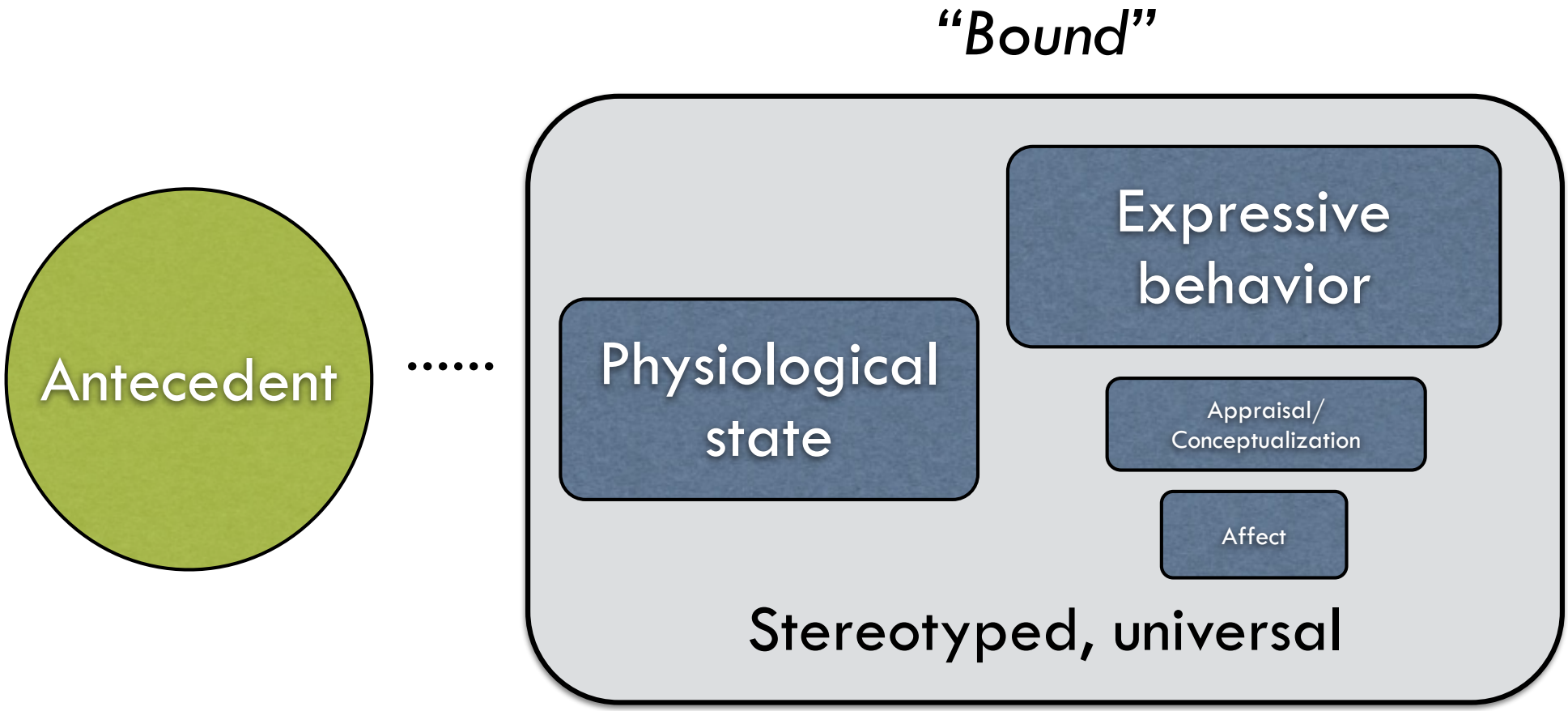
Core affect

Russell, 1980



- We are constantly experiencing an emotional state that sits somewhere on the circumplex. This is called “core affect”.
- We sometimes interpret our core affect as a specific emotional response - *conceptualization* (more-or-less the same as an appraisal).
- Learning and knowledge about the world shapes our appraisals which ultimately dictate what conceptualizations we make.

Basic emotion theory

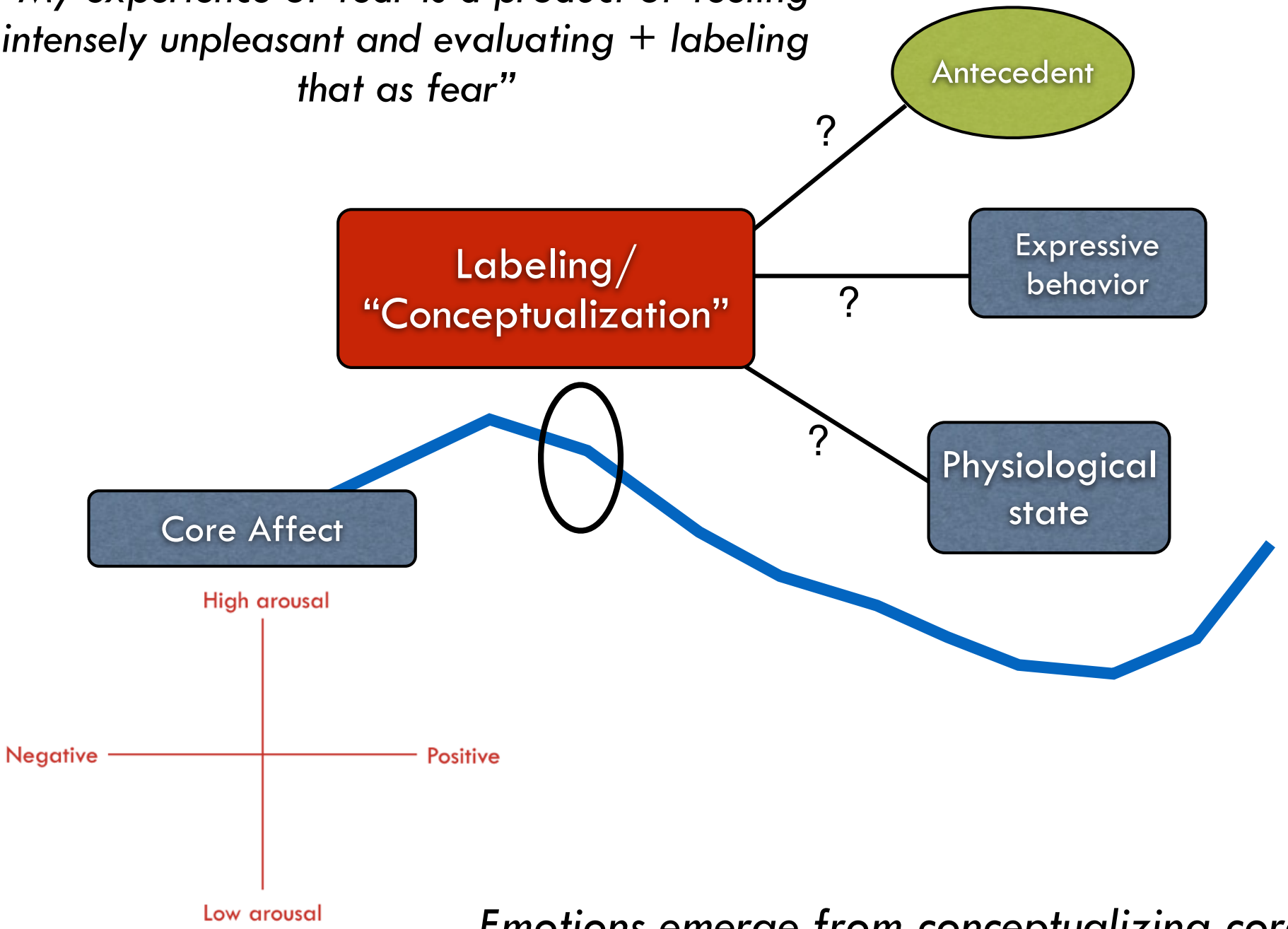


"The barking dog caused me to feel fear and all that comes with it"

Constructionist theory

"Unbound"
Not stereotyped
Idiosyncratic

"My experience of fear is a product of feeling intensely unpleasant and evaluating + labeling that as fear"

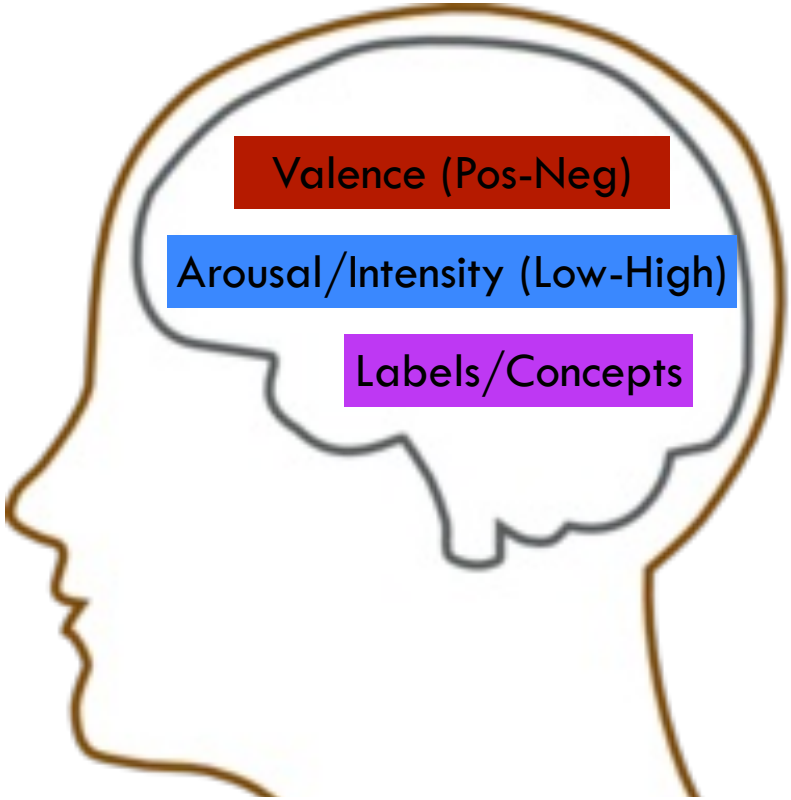


Emotions emerge from conceptualizing core affect

Basic emotion theory

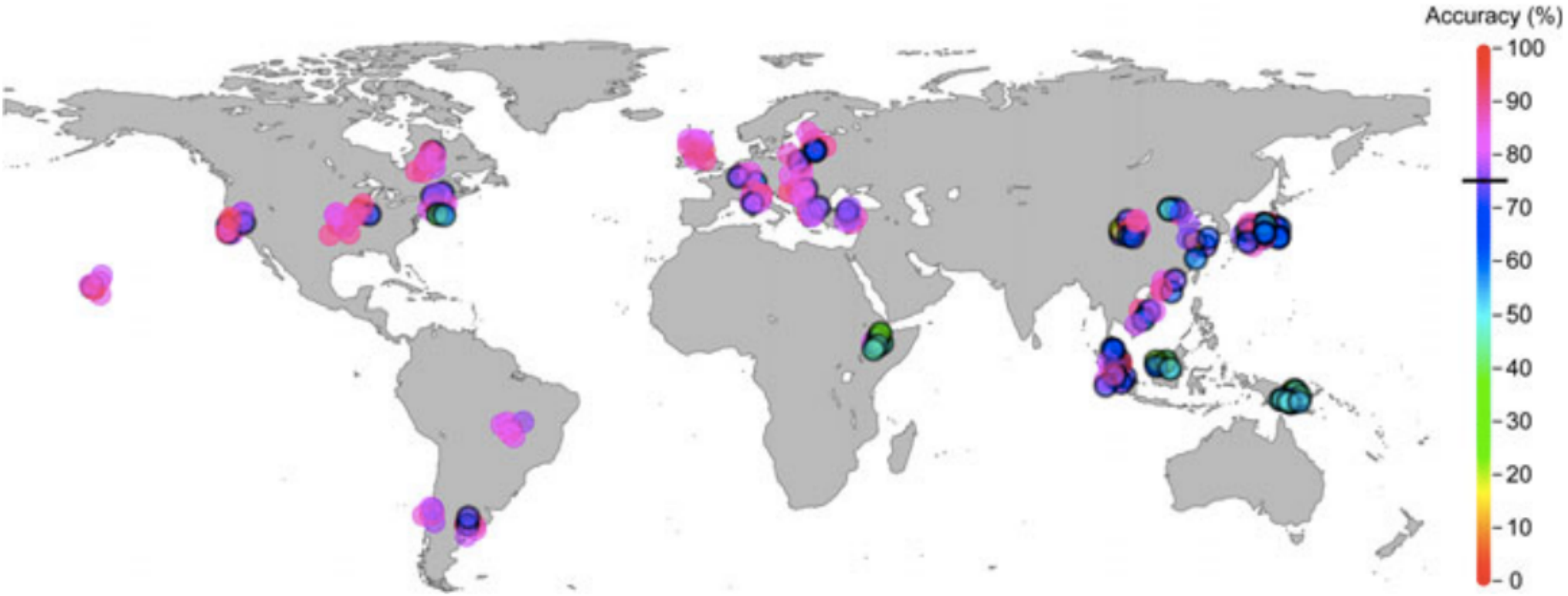
1. Universal
2. Elemental i.e., Similar within a category and distinct from one another
3. Category transitions (not blends)

Constructionist emotion theory



4. Made up of even more fundamental dimensions (like valence and intensity)
5. Guided by concepts and language we have
6. Experienced as blends (infinite number of combinations)

Recognition of the "6 basic expressions" across the world



Black outlines: <75%

Jack, 2013

Similar study to Ekman, different method

Hazda hunter gatherers (Tanzania)

Gendron et al., 2020

I *Universal?*

Claims of universality might be artificially inflated due to assessment method

Free labeling data

Hadza

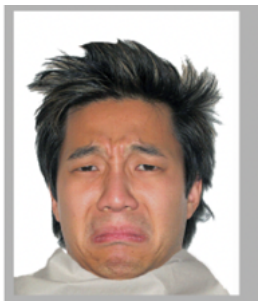
laughing (26)
happy (19)
good (6)
angry (2)
no problem (2)
idiosyncratic (17)

US

happy (34)
confident (3)
pleased (3)
conniving (2)
content (2)
something (2)
idiosyncratic (29)

Hadza

upset (9)
angry (7)
something (6)
crying (5)
ill (4)
unhappy (4)
bad (3)
grieve (3)
happy (3)
see (3)
grumble (2)



US

disgusted (30)
confused (4)
afraid (3)
disappointed (2)
sad (2)
scared (2)
shocked (2)

Hazda

angry (9)
something (8)
bad (7)
laughing (7)
see (6)
upset (6)
surprised (5)
happy (4)
afraid (3)
crying (3)
thinking (3)
good appearance (2)
IDK (2)
ill (2)
questioning (2)

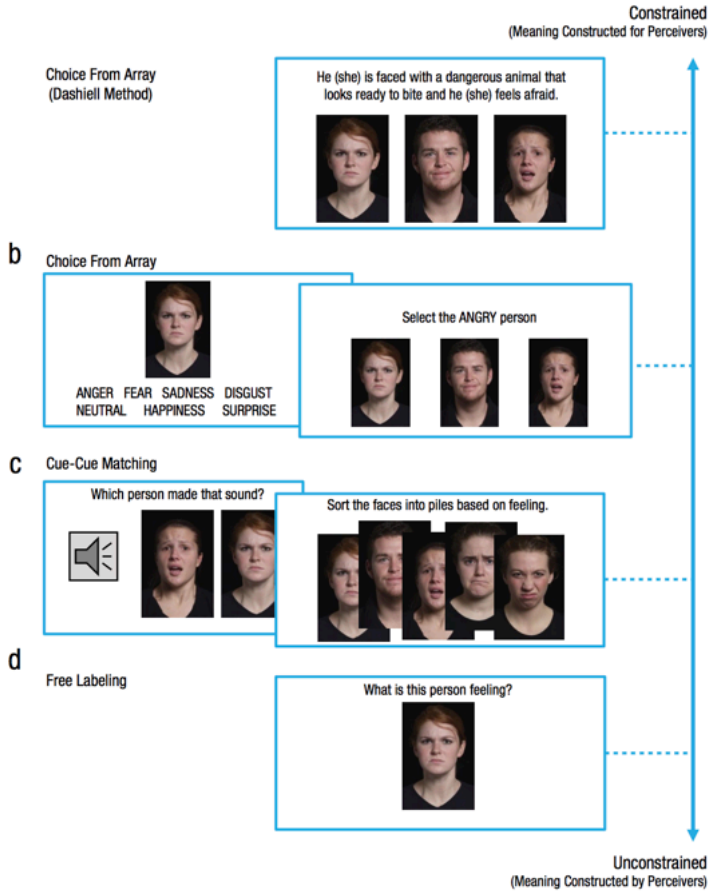
US

scared (14)
afraid (9)
nervous (4)
shocked (4)
disgusted (3)
startled (3)
surprised (3)
concerned (2)
grossed out (2)
worried (2)

Gendron et al., 2020

I *Universal?*

Claims of universality might be artificially inflated due to assessment method



More evidence for universality

Less evidence for universality

Universality Reconsidered: Diversity in Making Meaning of Facial Expressions

Maria Gendron[1], Carlos Crivelli[2], and Lisa Feldman Barrett[1]
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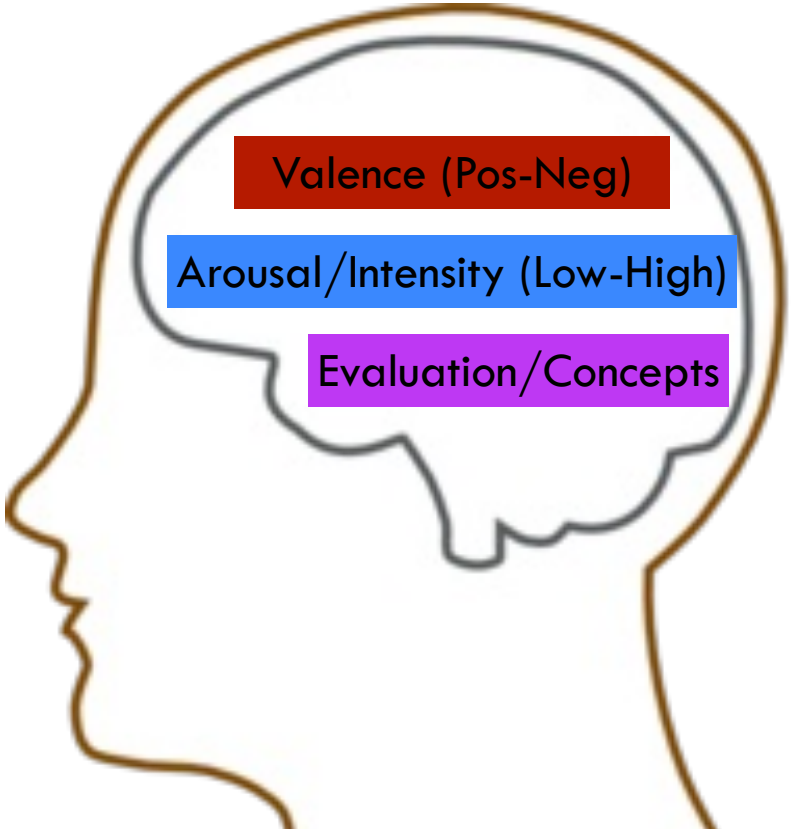
SAGE

Gendron et al., 2018

Basic emotion theory

1. Universal ?? Evidence on both sides
2. Elemental i.e., Similar within a category and distinct from one another
3. Category transitions (not blends)

Constructionist emotion theory



4. Made up of even more fundamental dimensions (like valence and intensity)
5. Guided by concepts we have
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2

Elemental i.e., Similar within a category and distinct from one another

John Cacioppo
1970s to 2018

DBP, diastolic blood pressure; BV, blood volume (includes head blood volume); CO, cardiac output (includes average height of IJ wave × pulse rate); LVET, left ventricular ejection time; PEP, preejection period; PTT, pulse transit time; SBP, systolic blood pressure; HR, heart rate; RSP-Dur, respiration duration (includes respiration rate, respiratory period, postinspiratory pause, expiratory time, inspiratory time, total cycle duration, respiratory intercycle interval); FPV, finger pulse volume (includes finger pulse volume amplitude, finger blood volume); FT, finger temperature; RSP-Amp, respiratory amplitude (includes respiratory depth, tidal volume, increase in functional capacity); SCL, skin conductance level (includes log conductance change, log palmar conductance); NNSCR, number of nonspecific skin conductance responses (includes number of galvanic skin responses, rate of galvanic skin responses); MVT, movement; SV, stroke volume (includes ballistocardiogram); FCT, face temperature; EMG, muscle activity (includes number of muscle tension peaks, maximum muscle tension increase); HT, hand temperature; TPR, total peripheral resistance (includes peripheral vascular resistance); SBF-Nod, nonoscillatory duration of the skin blood flow response; EDR-Dur, electrodermal response duration.

"In sum, the meta-analyses indicated that even a limited set of discrete emotions such as happy, sad, fear, anger, and disgust **cannot be fully differentiated by visceral activity** alone."

Cacioppo et al., 2000

2

Elemental i.e., Similar within a category and distinct from one another

Emotion Fingerprints or Emotion Populations? A Meta-Analytic Investigation of Autonomic Features of Emotion Categories

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The classical view of emotion hypothesizes that certain emotion categories have a specific autonomic nervous system (ANS) "fingerprint" that is distinct from other categories. Substantial ANS variation within a category is presumed to be epiphenomenal. The theory of constructed emotion hypothesizes that an emotion category is a population of context-specific, highly variable instances that need not share an ANS fingerprint. Instead, ANS variation within a category is a meaningful part of the nature of emotion. We present a meta-analysis of 202 studies measuring ANS reactivity during lab-based inductions of emotion in nonclinical samples of adults, using a random effects, multilevel meta-analysis and multivariate pattern classification analysis to test our hypotheses. We found increases in mean effect size for 59.4% of ANS variables across emotion categories, but the pattern of effect sizes did not clearly distinguish 1 emotion category from another. We also observed significant variation within emotion categories; heterogeneity accounted for a moderate to substantial percentage (i.e., $I^2 \geq 30\%$) of variability in 54% of these effect sizes. Experimental moderators epiphenomenal to emotion, such as induction type (e.g., films vs. imagery), did not explain a large portion of the variability. Correction for publication bias reduced estimated effect sizes even further, increasing heterogeneity of effect sizes for certain emotion categories. These findings, when considered in the broader empirical literature, are more consistent with population thinking and other principles from evolutionary biology found within the theory of constructed emotion, and offer insights for developing new hypotheses to understand the nature of emotion.

Distinct across categories?

Similar within categories?

Siegel et al., 2018