



Language
Technologies
Institute

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Multimodal Affective Computing

Lecture 3: Theories Behind Psychological Constructs

Jeffrey Girard

Louis-Philippe Morency

Outline of this week's lecture

- Theories of affect and emotion
 - Widely accepted aspects and controversies
- Theories of personality
- Theories of psychopathology
- Theories of interpersonal functioning



Theories of Affect and Emotion

Defining affect and emotion

- "Affect" and "emotion" have many different meanings depending on who is using them and in what context
- Here, we use "affect" as a broad term that encompasses phenomena related to emotions, moods, and feelings
- I will first present general information about affect and emotion that is generally agreed upon in psychology
- Then I will discuss some controversies that currently exist in psychology about affect and emotion

Defining affect and emotion

Affective Phenomena



Affective traits

Broad and general
Longer-lasting
Less contextualized
Less tied to a cause

Mood states

Emotion states

Specific and narrow
Shorter-lasting
More contextualized
More tied to a cause

Sensory states



Defining affect and emotion

Affective Phenomena



Affective traits

Irritability, Positivity

Mood states

Bad mood, Good mood

Emotion states

Anger, Happiness

Sensory states

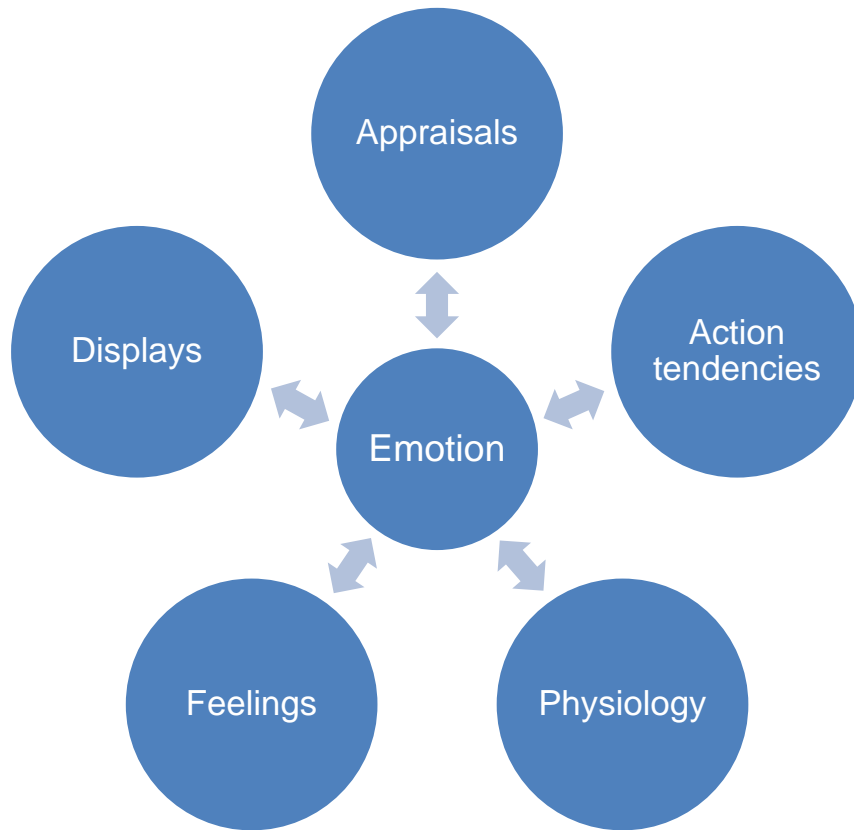
Pain, Pleasure



Emotions are functional at many levels

- Emotions serve individual functions
 - **Individuals:** help meet particular threats, challenges, and opportunities within the immediate environment
- Emotions also serve collective social functions
 - **Dyads:** signal mental states, reward and punish prior actions, evoke complementary or reciprocal behavior
 - **Groups:** define group boundaries and members, define group roles and identities, motivate collective action
 - **Cultures:** define cultural identity, identify norms and values, reify cultural ideologies and power structures

Components of emotion



- **Appraisals**
 - Evaluate meaning of events
- **Action tendencies**
 - Motivate specific actions
- **Physiology**
 - Prepares body for actions
- **Feelings**
 - Signal emotion to self
- **Displays**
 - Signal emotion to others

Components of emotions

Think of an event that would cause you to feel a strong emotion

1. How are you evaluating the meaning of the event?
2. What actions does this emotion motivate you to engage in?
3. How does this emotion prepare your body for these actions?
4. How do you know what kind of emotion you are feeling?
5. How do others know what kind of emotion you are feeling?

Advanced questions

- What emotion might result if this event was appraised differently?
- How are two (or more) of the above components inter-connected?

Controversies in affective science

- What is the best way to organize emotions?
 - Should we use categories or dimensions?
 - How many categories or dimensions should we use?
 - Which specific categories or dimensions should we use?
- Are emotions universal or culturally determined?
 - Are emotions recognized/perceived the same everywhere?
 - Are emotions produced/expressed the same everywhere?
 - Are some aspects of emotion universal and others cultural?

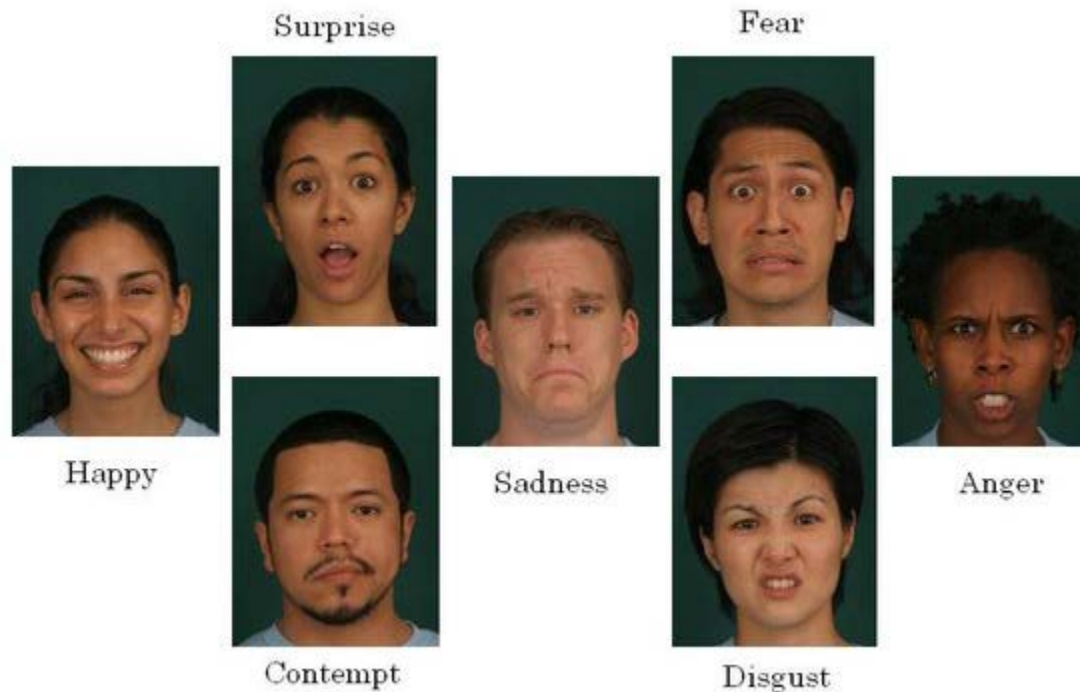


Categorical approaches to organizing emotion

- Categorical approaches **emphasize differences** between emotions and seek to identify discrete categories of emotion that are distinguishable
- Some theories identify emotion categories by looking for patterns in *facial expressions* and *biological correlates*
- Other theories identify emotion categories by looking for patterns in *appraisal themes* and *action tendencies*
- Still other theories identify emotion categories by looking for patterns in emotion-related *language usage*

Categorical approaches to organizing emotion

"Basic" emotion categories based on facial expressions/physiology



Matsumoto & Ekman (2008). Facial expression analysis. *Scholarpedia*, 3(5), 4237.

Categorical approaches to organizing emotion

"Functional" emotion categories based on appraisals/actions (negative)

Emotion	Appraisal Theme	Action Tendency
Anger	Offense against self	Restore justice
Contempt	Other violates obligation	Lower other's reputation
Disgust	Contact with impure thing	Push away from thing
Embarrassment	Self violates convention	Apologize for violation
Envy	Other is superior to self	Reduce other's status
Fear	Imminent threat to self	Flee or reduce threat
Guilt	Self caused improper harm	Remedy harm
Jealousy	Other threatens affection	Protect source of affection
Sadness	Irrevocable loss	Acquire new goods
Shame	Self transgressed ideal	Hide or avoid scrutiny

Keltner & Lerner (2010). Emotion. *Handbook of social psychology* (5th ed., Vol. 1, pp. 317–352).

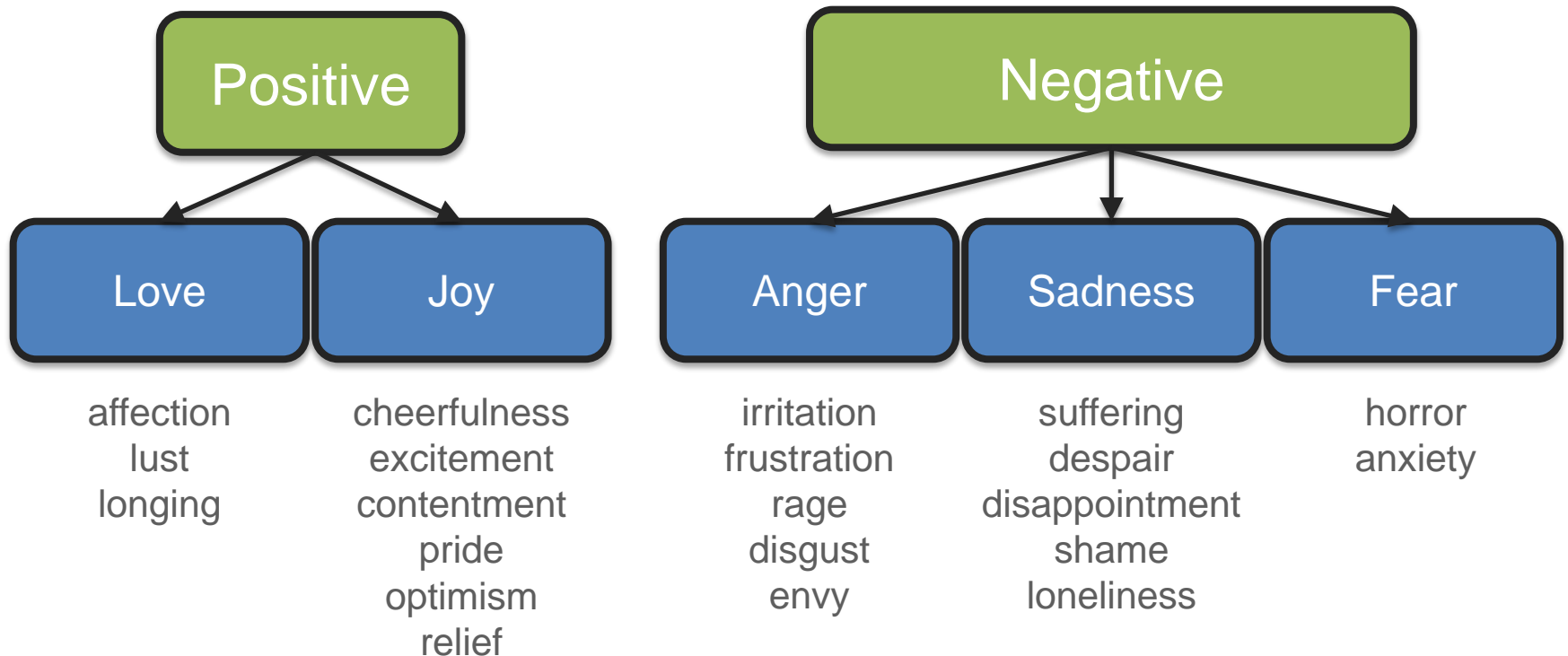
Categorical approaches to organizing emotion

"Functional" emotion categories based on appraisals/actions (positive)

Emotion	Appraisal Theme	Action Tendency
Contentment	Pleasing stimulus	Savoring
Enthusiasm	Reward likely	Approach goal
Love	Perceived commitment	Affection
Sexual desire	Sexual opportunity	Sexual release
Compassion	Undeserved suffering	Prosocial approach
Gratitude	Unexpected gift	Promote reciprocity
Pride	Self-relevant achievement	Display status
Awe	Self is small in comparison	Devotion or reverence
Interest	Novel opportunity	Exploration
Amusement	Recognize incongruity	Play
Relief	Cause of distress ends	Signal safety

Categorical approaches to organizing emotion

"Lexical" emotion categories based on language usage



Shaver et al. (1987). Emotion knowledge. *Journal of Personality and Social Psychology*, 52(6), 1061–1086.

Dimensional approaches to organizing emotion

- Dimensional approaches **emphasize similarities** between emotions and seek to identify underlying dimensions that account for this similarity
- Some theories identify affective dimensions in a data-driven manner using *factor analysis* on emotion data
- Other theories identify affective dimensions by focusing on theoretical aspects of the *emotion appraisal* process

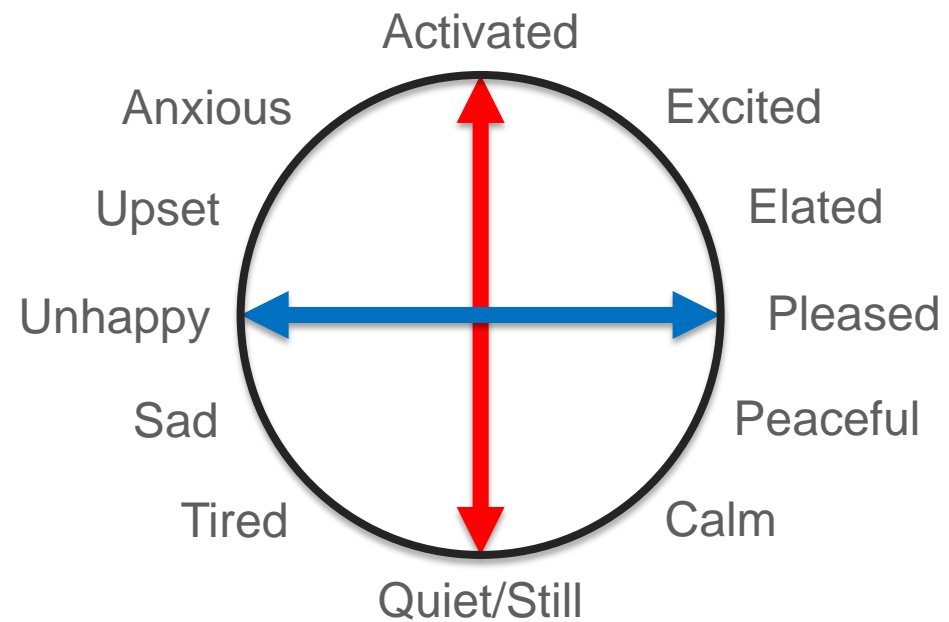
Dimensional approaches to organizing emotion

"Core affect" affective dimensions based on factor analysis

Two-dimensional models focus on
Valence - positive vs. negative
Arousal - active vs. inactive

These two dimensions form a circle or "circumplex model" which forms blends of the two dimensions

Similar theories sometimes add more dimensions (e.g., power)



Yik, Russell, & Steiger (2011). A 12-point circumplex structure of core affect. *Emotion*, 11(4), 705–731.

Dimensional approaches to organizing emotion

"Appraisal-based" affective dimensions based on appraisal theory

Dimension	Aspects
Novelty	Suddenness, change, attention, (familiarity)
Pleasantness	Valence, positivity, pleasure, (negativity), (pain)
Importance	Goal relevance, consequences
Certainty	Likelihood, probability, confidence
Controllability	Power, agency, ability to influence outcomes
Responsibility	Self-caused, [situational], (other-caused)
Legitimacy	Fairness, deservedness, justice

Ellsworth & Scherer (2003). Appraisal processes in emotion. *Handbook of affective sciences* (pp. 572–594).

Recommended instruments for affect

- DEQ (<http://doi.org/10/gfsw34>)
 - Discrete Emotions Questionnaire (4 items/emotion)
 - Negative emotions: anger, disgust, fear, anxiety, sadness
 - Positive emotions: happiness, desire, relaxation
- Affective Slider (<http://doi.org/10/f8rq92>)
 - One-item pictorial measure of arousal
 - One-item pictorial measure of valence
- GAQ (<http://bit.ly/GAQscale>)
 - Geneva Appraisal Questionnaire (in English, French, German)
 - 34-item questionnaire that measures many appraisal dimensions

Theories of Personality

Defining personality

- Personality describes a person's characteristic **patterns of thinking, feeling, and behaving**
- Personality is meant to capture **relatively enduring** patterns that last on the order of years or decades
- Personality is meant to be **probabilistic** not deterministic
- Personality has **complex interactions with context**, such as aspects of the physical and social environment
- Personality is like a probability distribution with *traits* determining the center and *context* determining spread

Categorical approaches to personality

- Because categorical thinking comes so easily to us, there have been many categorical models of personality
- Early models were based on the "humors" or "elements"
- More recent models argue for between two and sixteen personality types (e.g., the Myers-Briggs Type Indicator)
- However, the empirical support for categorical models of personality is *very, very poor* and the field has moved on
- There is now widespread consensus that personality is best understood with a **hierarchical model of dimensions**

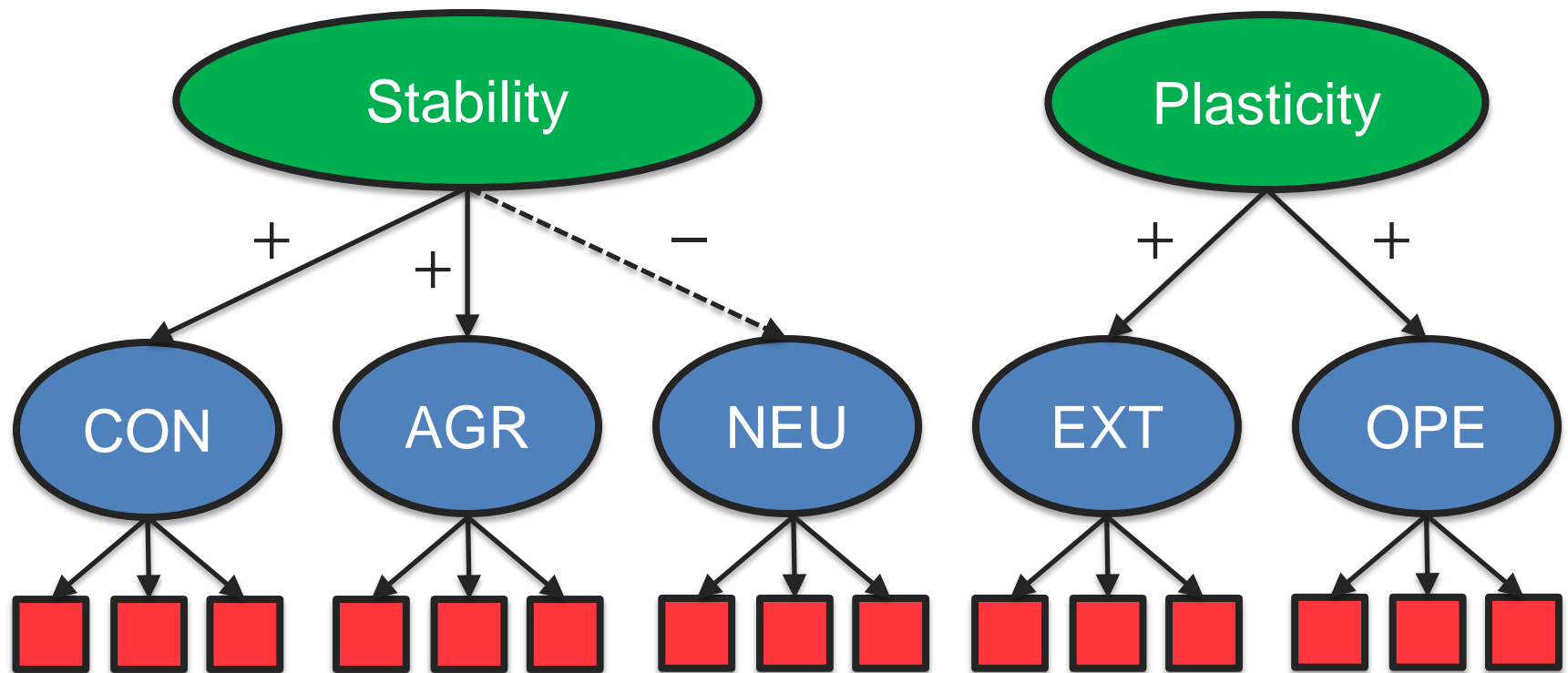
Big 5 Model of Personality

- The dominant personality model is now the "Big 5" or "Five Factor" model, which propose five trait dimensions
 - Extraversion, Agreeableness, Conscientiousness, Neuroticism, Openness
- As a hierarchy, there appear to be two higher-order "meta-traits" that capture similarities in the Big 5 traits
 - Alpha/Stability and Beta/Plasticity
- It is widely agreed that each trait can be broken down into more narrow sub-constructs called "facets"
- However, the field has not yet fully agreed on the best set of facets for each trait and so several options exist

Big 5 Model of Personality

Trait	Brief descriptions
Neuroticism	Tendency to be prone to psychological stress Tendency to experience unpleasant emotions
Extraversion	Tendency to seek social stimulation from others Tendency to be energetic, assertive, and talkative
Openness	Tendency to appreciate new ideas and experiences Tendency to be creative and intellectually curious
Agreeableness	Tendency to be compassionate and cooperative Tendency to be trusting and willing to help others
Conscientiousness	Tendency to be organized and to prefer planning Tendency to be dependable and self-disciplined

Big 5 Model of Personality



Big 5 Model of Personality

Trait	Facets from the BFI-2
Neuroticism	Anxiety, Depression, Emotional Volatility
Extraversion	Sociability, Assertiveness, Energy Level
Openness	Intellectual Curiosity, Aesthetic Sensitivity, Creative Imagination
Agreeableness	Compassion, Respectfulness, Trust
Conscientiousness	Organization, Productiveness, Responsibility

- How externally observable or expressed are each trait/facet?
- What behaviors and modalities might express each trait/facet?
- What situations would allow each trait/facet to be expressed?

HEXACO: A sixth dimension?

- Early personality researchers tried not to include any moral or ethical questions in their questionnaires
- As a result, there are no traits in the Big 5 model that are *explicitly* about moral or ethical tendencies
- A recent model called HEXACO includes the Big 5 trait dimensions but also adds a "Honesty-Humility" trait
 - **Facets:** Sincerity, Fairness, Modesty, Greed-Avoidance
- Because of this addition, the meaning of Agreeableness and Neuroticism in HEXACO is somewhat changed

Recommended instruments for personality

- Although instruments exist with only one or two items per personality trait, they tend to be quite unreliable
 - If you are interested in traits, look for at least 5 items per trait
 - If you are interested in facets, look for at least 3 items per facet
- BFI-2 (<http://www.colby.edu/psych/personality-lab/>)
 - The Big Five Inventory 2nd Edition is free and has translations
 - The BFI-2 has 60 total items (4 items/facet, 3 facets/trait)
 - The BFI-2-S is a short form with 30 total items (6 items/trait)
 - *Be careful when scoring, as some items are reverse-scored*
- IPIP (<https://ipip.ori.org/newMultipleconstructs.htm>)

Theories of Psychopathology

Defining psychopathology

- **Psychopathology** is a broad term for **mental disorders**
- Disorders are patterns of thinking, feeling, and behaving
- Disorders tend to last on the order of **weeks to years**
- To count as psychopathology, patterns must show:
 1. **Deviance:** unacceptable or uncommon in society
 2. **Distress:** cause negative feelings in self or others
 3. **Dysfunction:** prevents a normal, healthy lifestyle
 4. **Danger:** potentially harmful to self or others

Two main approaches to psychopathology

■ **Psychiatry**

- Represents a branch of medicine (psychiatrists are MDs)
- Views mental disorders as diseases of the brain and CNS
- Emphasizes treatment using drugs and medical interventions
- Uses "authoritative" approach to identify categorical *diagnoses*

■ **Clinical psychology**

- Represents a branch of psychology (psychologists are PhDs)
- Views mental disorders as maladaptive patterns (states/traits)
- Emphasizes treatment using psychotherapeutic interventions
- Uses "empirical" approach to identify hierarchical *dimensions*

Categorical approaches to psychopathology

- Psychiatry publishes diagnostic manuals (DSM and ICD)
- These manuals provide lists of diagnostic criteria
 - Each diagnosis has a set of symptoms that it may cause
 - Each is given a *threshold* or required number of symptoms
 - For example, many disorders in DSM need 5 out of 9 symptoms
 - Diagnoses are "all-or-nothing" based on the threshold
- Diagnostic manuals use the "authoritative" approach
 - Experts decide what the disorders, symptoms, and groups are
 - Political and financial factors can often influence this process

Categorical approaches to psychopathology

Incomplete example list of DSM-5 disorders and their thematic groupings

- **Depressive Disorders:** major depression, persistent depression, ...
- **Anxiety Disorders:** generalized anxiety, social anxiety, specific phobia, ...
- **Psychotic Disorders:** schizophrenia, delusional disorder, ...
- **Bipolar Disorders:** bipolar disorder (I and II), cyclothymia, ...
- **Obsessive-Compulsive Disorders:** OCD, hoarding disorder, ...
- **Trauma- and Stressor-related Disorders:** PTSD, acute stress disorder, ...
- **Eating Disorders:** anorexia, bulimia, binge eating disorder, ...
- **Addictive Disorders:** alcohol use disorder, opioid use disorder, ...
- **Personality Disorders:** narcissistic PD, borderline PD, dependent PD, ...
- **Neurodevelopmental Disorders:** ADHD, autism spectrum disorders, ...
- ...

Dimensional approaches to psychopathology

- There are practical issues with diagnostic manuals
 - Diagnostic thresholds are arbitrary and do not convey severity
 - There is overlap in the occurrence and symptoms of disorders
 - There is a lot of opportunity for heterogeneity within diagnoses
 - Authoritative decisions are often at-odds with empirical data
- Dimensional approaches attempt to address these issues
 - The severity of symptoms is retained without using thresholds
 - Overlap in symptoms and diagnoses is captured hierarchically
 - Heterogeneity is modeled explicitly using multiple dimensions
 - Empirical data are used to derive dimensions and hierarchies

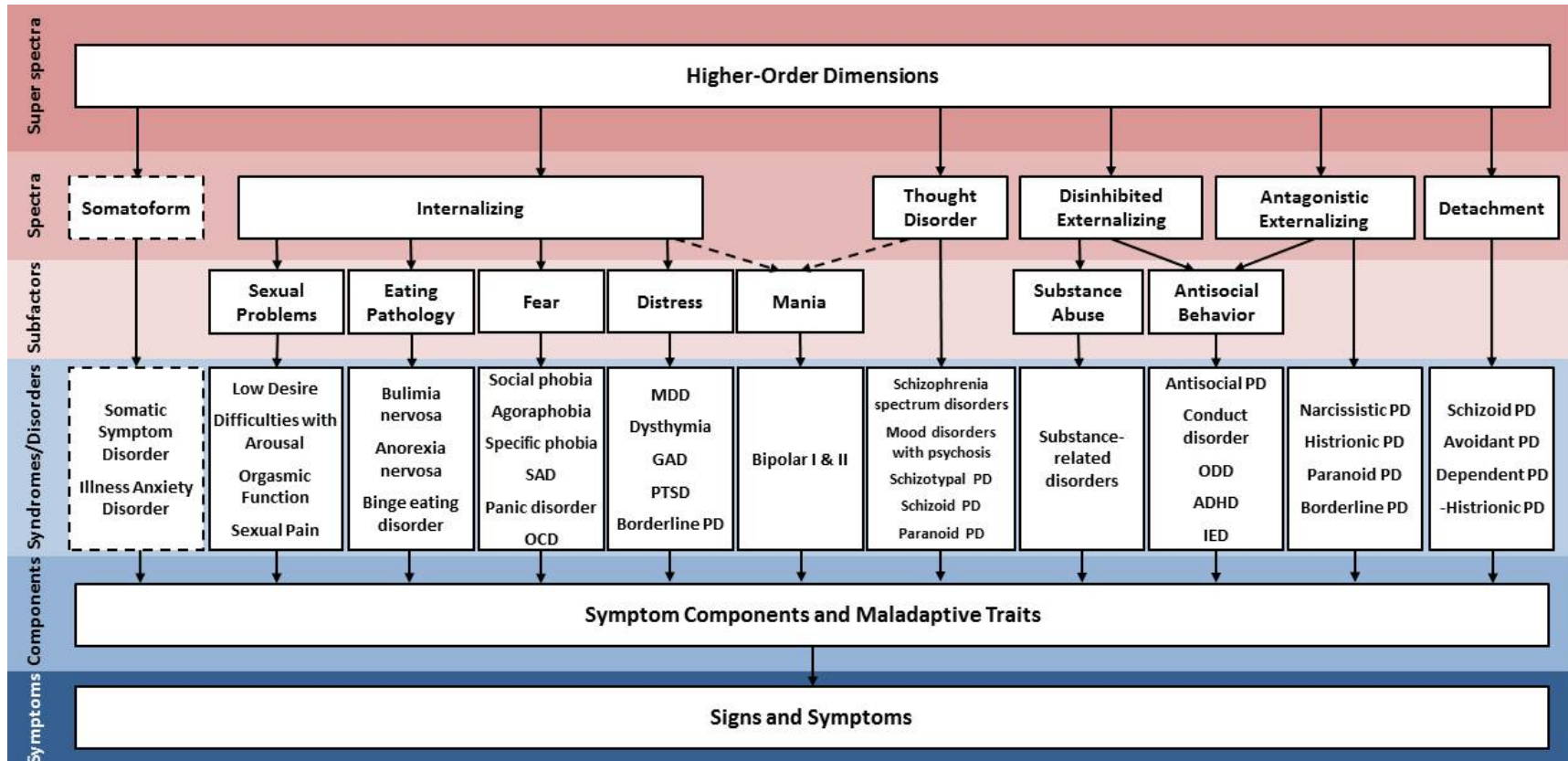
Dimensional approaches to psychopathology

Empirical traits and facets from the PID-5 Dimensional Model

Negative Affectivity	Detachment	Antagonism	Disinhibition	Psychoticism
Anxiousness	Withdrawal	Grandiosity	Irresponsibility	Unusual Beliefs
Depressivity	Anhedonia	Manipulativeness	Distractibility	Perceptual Dysregulation
Emotional Lability	Restricted Affectivity	Attention-Seeking	Impulsivity	Eccentricity
Separation Insecurity	Intimacy Avoidance	Deceitfulness	Risk-Taking	
Perfectionism		Callousness		
Perseveration		Hostility		
Suspiciousness				
Submissiveness				

Dimensional approaches to psychopathology

Hierarchical Taxonomy of Psychopathology (HiToP) Model



Open and active research questions

- Connections between personality and psychopathology
 - Neuroticism and Negative Affectivity/Internalizing (+)
 - Extraversion and Detachment (—)
 - Openness and Psychoticism/Thought Disorder (—)
 - Agreeableness and Antagonism (—)
 - Conscientiousness and Disinhibition (—)
- Refining and possibly expanding the hierarchy
 - Does somatoform deserve a place as a separate spectrum?
 - Where do neurodevelopmental and other rarer disorders fit in?
 - What are the best/most reproducible subfactors and syndromes?

Recommended instruments for psychopathology

- Categorical approaches
 - Structured diagnostic interviews by experts
Examples: SCID or MINI for adults, KSADS for children, etc.
 - Disorder-specific severity measures*
Examples: PHQ-9 for depression, PCL-5 for PTSD, etc.
- Dimensional approaches
 - Cross-cutting symptom measures*
Examples: PROMIS measures of mood, anxiety, sleep, etc.
 - Instruments designed to measure the hierarchy*
Examples: PID-5, CAT-PD-SF, etc.

*Many of these options are available for free at <http://bit.ly/apa-oam>

Theories of Interpersonal Functioning

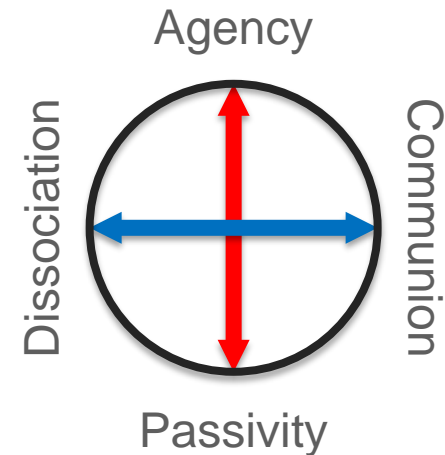
Defining interpersonal functioning

Interpersonal functioning

- How we relate with other people
- Spans behaviors, traits, and motives
- Related to personality and pathology

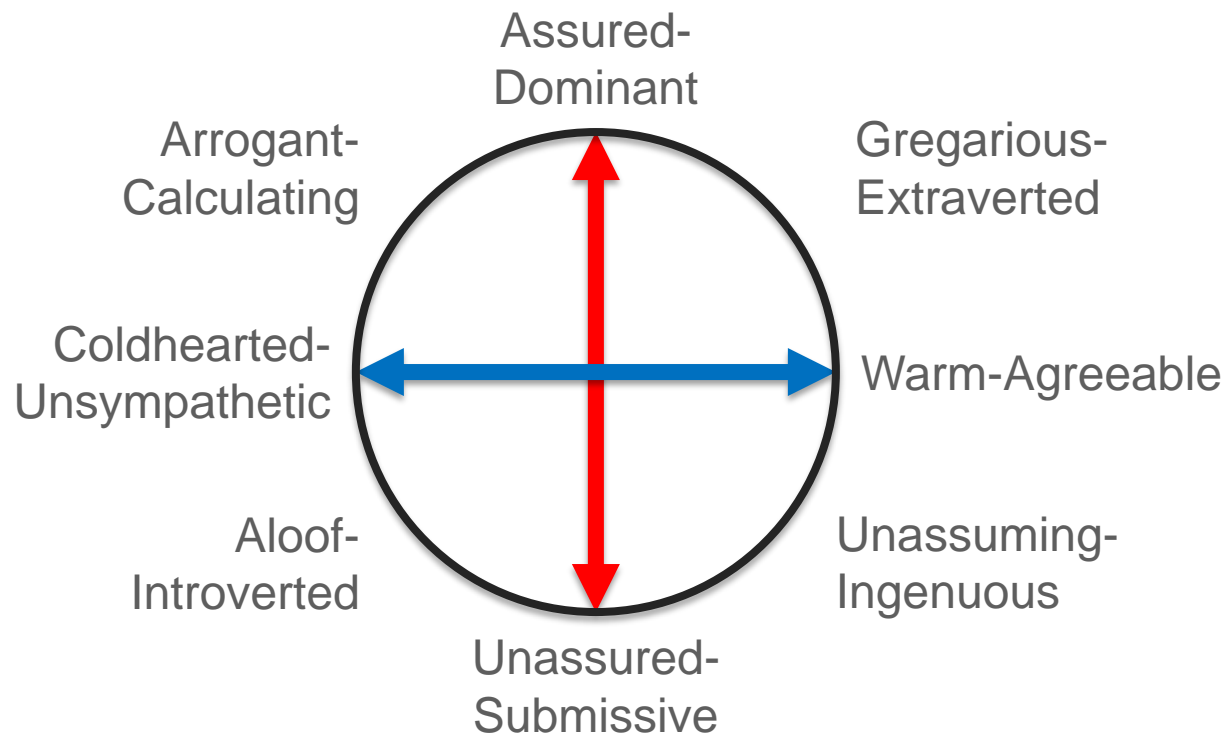
Interpersonal Circumplex model

- **Agency** vs. **Passivity**
power, mastery, assertion vs.
weakness, failure, submission
- **Communion** vs. **Dissociation**
intimacy, union, solidarity vs.
remoteness, hostility, disaffiliation



Pincus & Ansell (2013). Interpersonal theory of personality. *Handbook of Psychology, Volume 5* (2nd ed., pp. 141–159).

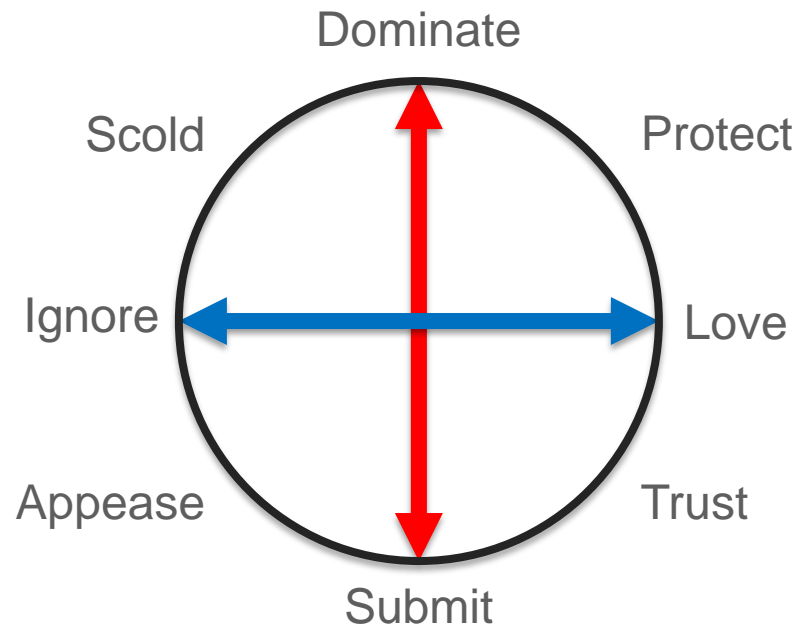
Interpersonal Traits



Agency Traits and **Communion Traits**



Interpersonal Behaviors

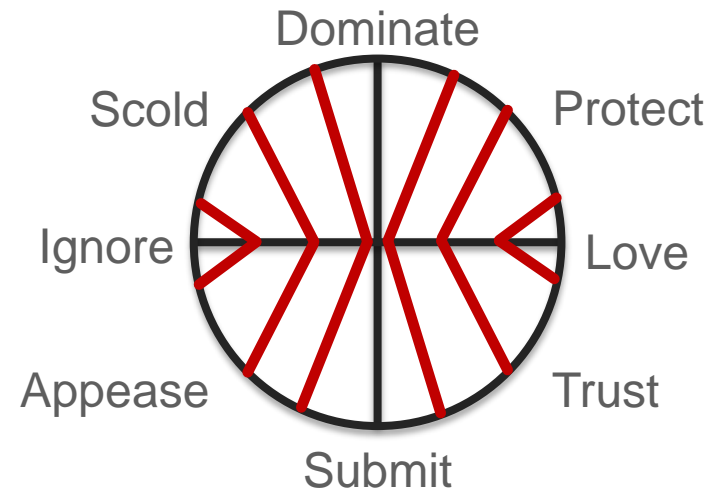


Agency Behaviors and **Communion Behaviors**



Interpersonal Complementarity

- Interactions tend to go more smoothly when interactants *match on communion* but *oppose on agency* behaviors
- Examples:
 - **Love** and **Love**
 - **Ignore** and **Ignore**
 - **Dominate** and **Submit**
 - **Scold** and **Appease**
 - **Protect** and **Trust**



Further Reading

Assigned:

- Gunes, H., & Schuller, B. W. (2013). Categorical and dimensional affect analysis in continuous input: Current trends and future directions. *Image and Vision Computing*, 31(2), 120–136.
- Wright, A. G. C. (2014). Current directions in personality science and the potential for advances through computing. *IEEE Transactions on Affective Computing*, 5(3), 292–296.
- Krueger, R. F., Kotov, R., Watson, D., Forbes, M. K., Eaton, N. R., Ruggero, C. J., ... Zimmerman, J. (2018). Progress in achieving quantitative classification of psychopathology. *World Psychiatry*.

Optional:

- Ellsworth, P. C., & Scherer, K. R. (2003). Appraisal processes in emotion. In H. H. Goldsmith, K. R. Scherer, & R. J. Davidson (Eds.), *Handbook of affective sciences* (pp. 572–594). Oxford University Press.
- Haslam, N., Holland, E., & Kuppens, P. (2012). Categories versus dimensions in personality and psychopathology: a quantitative review of taxometric research. *Psychological Medicine; Cambridge*, 42(5), 903–920.
- Horowitz, L. M., Wilson, K. R., Turan, B., Zolotsev, P., Constantino, M. J., & Henderson, L. (2006). How interpersonal motives clarify the meaning of interpersonal behavior: A revised circumplex model. *Personality and Social Psychology Review*, 10(1), 67–86.