Where do emotions come from?  
Why do we have them?  
What are they made of?  

Emotions are adaptive – they enhance our survival.

**Theories of Emotion**

- **Emotion** – a response of the whole organism, involving 1) physiological arousal, 2) expressive behaviors, and 3) conscious experience.
- Ex: Myers explains a situation in which he thought his son was kidnapped at a store.
  - Physiological arousal – heartbeat quickening
  - Expressive behaviors – quickened pace
  - Conscious experience – thoughts (is this a kidnapping?) and feelings (fear, later joy)

2 chicken-or-the-egg debates surrounding emotions:
- Does your physiological arousal precede or follow your emotional experience?
- Does cognition always follow emotion – does thinking precede or follow feeling?
  - Experience tells us that conscious awareness precedes physiological actions (sad → crying; angry → lashing out; afraid → trembling)

**James-Lange Theory** – the theory that our experience of emotion is our awareness of our physiological responses to emotion-arousing stimuli (feeling of emotions follow physical manifestations of emotions)
- Combination of William James and Carl Lange
- Ex: your car skids and your fishtail into another lane… once you realize you are ok, you realize you are trembling and your heart is pounding… THEN you feel the emotional wave of feelings about the gravity of what could have happened.

**Cannon-Bard Theory** – the theory that an emotion-arousing stimulus simultaneously triggers 1) physiological responses and 2) the subjective experience of emotion
- Walter Cannon, and later Phillip Bard
  - The body’s physiological responses are not distinct enough to trigger different emotions (ex: does a racing heart beat = fear? Love?; does crying = sadness? Happiness?)
  - Changes in the body’s state are too slow to trigger sudden emotions
- The emotion-triggering stimulus is routed simultaneously to the brain’s cortex → awareness of emotion WHILE SIMULTANEOUSLY… the emotion-triggering stimulus is routed to the sympathetic nervous system → arousal in the body.
• Ex: you heart beats AS you experience fear; one does not cause the other.

Schachter-Singer Two-Factory Theory – the theory that to experience emotion one must 1) be physically aroused and 2) cognitively label the arousal.
  • Physiology and cognition (memory, perception, and interpretations) together create emotions
  • To experience emotion, you must cognitive interpret and label the cause of the arousal.
**Embodied Emotion**

Emotions are not only felt by the mind, but by the entire body.

Emotions and the Autonomic Nervous System
- The autonomic nervous system mobilizes your body for action
- Parasympathetic nervous system – calms body
- Sympathetic nervous system – arouses body

<table>
<thead>
<tr>
<th><strong>Sympathetic (arousing)</strong></th>
<th><strong>Parasympathetic (calming)</strong></th>
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<tbody>
<tr>
<td>Pupils dilate</td>
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<td>Secret stress hormones</td>
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Arousal and Performance
- Arousal is adaptive… too much or too little can be disruptive
- Level of optimum arousal varies with task
  - Difficult tasks – lower level of optimal arousal
  - Easy tasks – higher level of optimal arousal

Physiological Similarities Among Specific Emotions
- Some emotions present similarly physiologically – fear, anger, and sexual arousal – even though they look and feel different

Physiological Differences Among Specific Emotions
- Fear and joy can produce similar heart rates, but activate different muscles → tension in the brow (fear) or movement in the cheeks and under the eyes (joy, smiling)
- Amygdala – fear and aggression (activity noticed during observing or experiencing these emotions)
- Emotions activate different parts of the brain’s cortex
  - Right frontal lobe → disgust, negative emotions, depression
  - Left frontal lobe → positive emotions and moods, enthusiasm, people with positive personalities
    - More dopamine (rewarding)

Cognition and Emotion
- Which comes first: Thinking or feeling?

Cognition Can Define Emotion
- Spillover effect – sometimes our arousal response to one event influences our response to the next event.
- Schachter and Singer’s experiment – injected college males with the hormone epinephrine… half were told of the side effects (flushed face, increased heart and breathing rates) and when they started to experience the effects, they attributed it to the injection. The other half was not told about the side effects and was placed in a waiting room with a man acting either euphoric or irritated. The participants in the second group “caught” the emotion that the man was feeling and attributed the side effects of the injection to feeling either happy or irritated. → emotion felt was based on how it was labeled (cognition)
- Arousal fuels emotion; cognition channels it.
Cognition Does Not Always Precede Emotion

- What happen when we feel an unlabeled emotion?
  - Ex: a bad feeling that cannot be labeled; you know there’s a reason for it but you can’t put your finger on it.
- Robert Zajonc – we feel emotional reactions apart from, or before, our interpretations of the situation.
  - Ex: people subliminally flashed a picture of a happy looking face drank 50% more fruit flavored drink than those flashed a neutral face… while the group flashed a angry looking face drank substantially less than both groups. \(\Rightarrow\) emotions can precede cognitive awareness of them
  - Demonstrates the speedy/immediate low road (sensory input goes directly to the thalamus then the amygdala to trigger a rapid reaction that is often out of our conscious awareness)

- Richard Lazarus – some emotional responses do not require conscious thinking but can be unconsciously appraised and labeled.
  - Demonstrates the thinking high road (sensory input goes from the thalamus to the sensory cortex, then prefrontal cortex to be appraised, then to the amygdala to trigger a reaction that can be out of conscious awareness but still appraised)
  - Feelings like guilt, happiness, and love \(\Rightarrow\) complex emotions
Lie Detection

- **Polygraph** – a machine, commonly used in attempts to detect lies, that measures several of the physiological responses accompanying emotion (such as perspiration and cardiovascular and breathing changes)
- Attempts to use physical indicators to indicate emotions
- Seen as increasingly questionable as our understanding of emotions has broadened
- Problems
  - Our physiological arousal is much the same from one emotion to the other
  - These tests err about 1/3 of the time, especially when innocent people respond with heightened tension to the accusations implied by the questions
- More than 9 in 10 psychophysicists and psychologists agreed that savvy criminals and spies could beat the test by augmenting their arousal to questions
- More appropriate way to use a polygraph is with the guilty knowledge test → assesses a suspect’s physiological responses to crime-scene details known only to the police and the criminal

Expressed Emotion

People’s expressive behaviors (expressions) can reveal their emotions.
- Does this nonverbal language vary with culture or is it universal?
- Do our expressions influence our experienced emotions?

Nonverbal Communication

- Most people can detect nonverbal cues, especially those that indicate a threat (angry faces).
  - Can understand movies and TV on mute or in a different language
- We read fear and anger mostly in the eyes and happiness in the mouth
- Experience can sensitize us to recognizing certain emotions → physically abused children are much quicker to recognize anger in a face; also more likely to perceive a face as angry if it is 40% anger and 60% fear.

Gender, Emotion, and Nonverbal Behavior

- Women generally surpass men at reading nonverbal emotional cues and at detecting lies → greater emotional literacy
- Women have a greater emotional responsiveness in both positive and negative situations; more likely to “open up”
- Women, far more than men, describe themselves as empathic (the ability to identify with others); also more likely to express empathy than men (cry or report distress when observing someone in distress)
- Women express emotion physically more than men.

Detecting and Computing Emotion

- Some facial muscles are hard to manipulate consciously to display emotion…
  - Worry/distress – lifting just the inner part of your eyebrows
  - Fear – eyebrows pulled together
  - Natural smile – activated muscles under the eyes and raised cheeks
- Authentic expressions are quick, unlike fake smiles which can last 4-5 seconds
- The untrained eye can detect lying about 50% of the time → random/chance
Those trained to detect liars can detect lies with greater accuracy, while searching for cues for guilt, despair, and fear.

- It is easier for us to detect emotions when we are not being deceived; but we need to be aware that body language cues can mean multiple things (ex: crossed arms can reveal irritation or relaxation).
- Nonverbal cues from facial expressions and body language are absent in computer-based communication (unless containing emoticons), and it can be easy to misread emotions and meanings in emails or texts.

### Culture and Emotional Expression

- The meaning of gestures varies with cultures
  - “Thumbs up,” while a gesture of praise and positivity in North America, can be an insult in other cultures. Also, raising the middle finger (derogatory in North America) may not carry the same meaning in other cultures.
- Facial expressions carry basically the meaning in all cultures.
  - A smile conveys happiness; anger and fear are universal.
  - This similarity has nothing to do with shared experiences such as American movies, European news channels, etc.
- However, people of the same culture can more easily identify facial expressions of people of their own culture.
- Blind people, who have never seen facial expressions, also demonstrate the same facial expressions for certain emotions as seeing people.
- Universally, infants cry when distressed, smile when happy, and shake their heads when defiant.

#### Evolutionary perspective

- We share the same facial expressions because it was a common language that allowed our ancestors to communicate or detect threats.
- Emotional expressions can enhance survival
  - Surprise raises the eyebrows and widens the eyes to take in more information
  - Disgust wrinkles the nose to close off the airway to foul smelling or dangerous odors
- The expression of emotions in public and their intensity changes between cultures
  - People of Western cultures tend to display more emotion than people from Japan.

### The Effects of Facial Expressions

- Expressions not only communicate emotion, but amplify and regulate it.
  - Facial feedback hypothesis - making certain facial expressions can make you feel the effects of the conveyed emotion.
    - Smiling can make you happier.
  - Behavior feedback hypothesis - going through the motions awakens the emotions
    - If we move our body as if we were experiencing an emotion, we are likely to feel that emotion to some degree.

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Experienced Emotion

- How many emotions are there?
  - Carroll Izard – 10 basic emotions (joy, interest-excitement, surprise, sadness, anger, disgust, contempt, fear, shame, and guilt)
  - Some psychologists believe pride and love are also basic emotions

- Two dimensions of emotions
  - Arousal (high or low)
  - Valence (pleasant or unpleasant)

![Emotion Diagram]

Fear

- Fear can be poisonous, contagious, and fatal.
  - 1903 fire in Chicago’s Iroquois theater – a small fire caused more than 500 people to die, not from the fire but from being trampled by others due to fear.
- Fear is adaptive → the body’s alarm system that prepares us to flee from danger (real or imagined)

Learning Fear

- Learning fear through conditioning
  - Little Albert
  - Crawling leads infants to gradually fear heights through falls and near-falls
  - Any experience can lead to a conditioned fear

- Learning fear through observation
  - Wild monkeys fear snakes while lab monkeys do not → lab monkeys observed wild monkeys’ fearful behavior around snakes and learned to fear snakes from this observation.
  - 9/11 produced a fear of flying from the observation of such a traumatic event.
  - Sandy Hook students scared of school after observing shooting. (NPR “Shootings Leave Sandy Hook Survivors Rethinking the Odds” – fear could be explained by conditioned or observationally learning).

The Biology of Fear

- We may be biologically prepared to learn certain fears more quickly than others.
  - Snakes, spiders, cliffs, etc – fears that probably helped our ancestors survive
  - Unprepared for new-age dangers like cars, electricity, bombs, global warming – all of which are now far more dangerous

- Amygdala – in the limbic system (emotion), deals with fear and aggression
  - Associates fears with specific situations
  - Receives input from cortical areas that process emotion and sends output information to other areas that produce the bodily symptoms of fear

- Phobia – an intense fear of objects or situations that disrupts the ability to cope

- Fear may be genetically influenced
  - Scientists have found a gene, that when shorter in some people, experience more fear due to decreased serotonin absorption.
Anger

- Anger usually stems from a reaction to something someone has done, especially when the act is seen as having ill intentions. Anger can also stem from “blameless annoyances” like foul smells, traffic, high temperatures, etc.
- Boys report resolving anger with exercise while girls resolve anger by talking with a friend, listening to music, or writing.
- Anger can lead to aggression, prejudice, and illness.
- Western cultures encourage anger venting, while not encouraged in collectivist cultures.
- Catharsis – emotional release; can be achieved through venting anger an aggressive way or fantasy
  - Expressing anger towards the cause/blame for the anger can be helpful if it does not leave us feeling guilty or anxious.
  - However, catharsis can lead to more anger by provoking more retaliation, magnifying anger (expressing anger makes you feel the anger → behavior feedback hypothesis) – “Venting to reduce anger is like using gasoline to put out a fire.” – Brad Bushman, studied anger
- What is the best way to handle anger?
  - Wait and let the emotion simmer.
  - Find appropriate outlets for anger instead of ruminating on it (exercise, talking with a friend, etc)
  - Form nonaccusatory statements to discuss anger (I get irritated when dirty dishes are left in the sink.)

Happiness

- People who are happy perceive the world as safer, make decisions more easily, rate job applicants more favorably, are more cooperative, and live healthier, more energized and satisfied lives.
- When your mood is gloomy, life as a whole seems more depressing (remember state-dependent memories?)
- When we feel happy we are more likely to help others.
  - Feel-good-do-good phenomenon – people’s tendency to be helpful when already in a good mood.
- Subjective well-being – self-perceived happiness or satisfaction with life; used along with objective well-being which focuses on physical and economic indicators.

The Short Life of Emotional Ups and Downs

- Positive emotions rise over the early to middle part of the day, while negative emotions are common just after waking and just before falling asleep.
- Moods triggered by good or bad events seldom last beyond that day.
- People tend to rebound from bad days with better-than-usual good days.
- Significant bad events can cause prolonged sadness, but we adapt and can return to average levels of day-to-day happiness.

Wealth and Well-Being

- Wealth can increase short-term happiness, but has not been seen to increase long-term happiness.

Two Psychological Phenomena: Adaptation and Comparison

- Adaptation-level phenomenon – our tendency to form judgments relative to a neutral level defined by our prior experience.
  - The neutral point fluctuates depending on events in one’s life.
- Relative deprivation – the perception that one is worse off relative to those with whom one compares oneself.
  - Sports stars or celebrities that complain that they aren’t paid enough.
Predictors of Happiness

- Happiness (and all emotions) is a biopsychosocial phenomenon.
  - Biological – genetics, brain activity
  - Psychological – outlooks, interpretation of experiences
  - Cultural – emotional expression (how much or little) varies with cultures

How to be Happier

- Realize happiness does not stem from money or wealth.
- Take control of your time (set goals, short and long term)
- Act happy
- Seek work and leisure that engage your skills.
- Exercise.
- Sleep enough.
- Form and value close relationships
- Do good → feel good
- Be grateful
- Nurture your spiritual self.