"The essential difference between emotion and reason is that emotion leads to action while reason leads to conclusions."

-Donald Calne

WHAT ARE EMOTIONS?

EMOTIONAL INTELLIGENCE AND THE NEUROSCIENCE OF EMOTIONS

Heidi Reyst, PhD, CBIST

SAGE NEUROWELLNESS

EMOTION COMPONENTS

PHYSIOLOGICAL

- Heart palpitations
- Stomach distress
- Sweating
- Hot or cold flashes
- Shortness of breath
- Fatigue
- Muscle tension
- Increased energy

COGNITIVE

- Appraisal of what's happening
- Expectations of the situation
- The subjective aspect
- Feelings

BEHAVIORAL

- How I react
- What I do
- Body language
- Facial expression

ROADMAP & GOALS

FUNCTION OF EMOTIONS

Some definitions…

- An instinctive or intuitive feeling as distinguished from reasoning or knowledge
- A feeling such as happiness, love, fear, anger, or hatred, which can be caused by the situation that you are in or the people you are with
- The expression of feeling

EMOTIONS ARE IMPULSES TO ACT

WHAT EMOTIONS ARE NOT…

- Moods, feelings and emotions are often thought of as the same thing
- They are related, but distinct…

Emotions occur rapidly in response to a specific external stimulus,
They are temporary, can be intense, and are involuntary
Feelings are the thoughts and interpretations of those emotions
Moods tend to be more mild and last longer,
They may have no identifiable beginning
They tell us about our inner state

… emotions are helpful for making decisions, moods are not

FUNCTION OF EMOTIONS

NEGATIVE

- Negative emotions are thought to play a significant role in survival
- Their major function is to alert us to threats and danger

POSITIVE

- Positive emotions are related to health and well-being

"Emotions are not problems to be solved. They are signals to be interpreted."

-Vironika Tugaleva

THE FUNCTION OF EMOTIONS

FUNCTION OF EMOTIONS - FEAR

- Is experienced when we perceive there is a potential danger AND we are relatively powerless over this danger
- Inspires the fight or flight response –leading to avoidance or escape from danger
- Psychopathology, anxiety, phobia and panic

Physiological Response

- Rapidly increased cardiac activity
- Increased breathing rate; then shallow and irregular

Related Emotions

Anxiety; Apprehension; Nervousness; Concern; Consternation; Misgiving

POSITIVE & NEGATIVE EMOTION FUNCTIONS

OUR EMOTIONAL EXPERIENCE

	PHYSIOLOGICAL	COGNITIVE	BEHAVIORAL
"NEGATIVE" EMOTION	NARROWS OUR ATTENTION	FOCUSES OUR THOUGHTS	NARROWS OUR BEHAVIOR
"POSITIVE" EMOTION	INCREASES OUR ATTENTION	EXPANDS OUR THOUGHTS	WIDENS OUR BEHAVIOR

FUNCTION OF EMOTIONS - ANGER

- Tries to change the situation – it's not a passive emotion
- Is extremely situational in terms of how useful it is
- Pathological end, hatred and violence

Physiological Response

- Excessive increase in activation and preparation for action
- Increase in cardiac activity
- Muscle tone & breathing increase
- Increase in adrenaline

Related Emotions

Fury; Outrage; Resentment; Wrath; Exasperation; Indignation; Annoyance; Irritability; Hostility

SO, HOW MANY EMOTIONS ARE THERE?

- There are likely innumerable emotions available to us, likely more than we have the words for
- There have been many attempts to quantify how many emotions exist in the human repertoire
- Paul Eckman identified what he called Universal Emotions
  - This was based on facial expression research
  - He viewed them as universal because the facial expressions that certain emotions elicited were found across distinctly unique cultures

SURPRISE

- **Surprise** is a reaction provoked by something unexpected, new, or strange
- The purpose of surprise is to empty our working memory in order to face the unexpected stimulus
- There are good surprises and bad surprises

Physiological Response

- Activate attentional processes
- This happens in the form of endorphins flooding the brain
- Decreased heart rate
- Increased muscle tone

Related Emotions

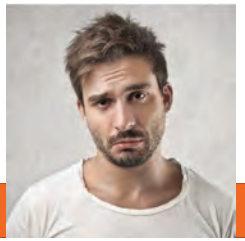
Shock; Astonishment; Amazement; Wonder

FUNCTION OF EMOTIONS - SADNESS

- The purpose of sadness is to act in situations where the subject finds themselves powerless or can't take any direct action
- Fulfills very important roles
- Pathological end is severe depression

Physiological Response

- A significant reduction in cognitive and behavioral activity
- Plays a self-protective role and focuses attention to oneself, and pushes us to find supports



Related Emotions

Grief; Sorrow; Cheerlessness; Gloom; Melancholy; Self-pity; Loneliness; Dejection; Despair

DISGUST

- **Disgust** serves the evolutionary purpose of keeping us safe from harm
- The adaptive function of disgust is to reject any stimulus that could be toxic
- This also results in rejection of toxic social stimuli too

Physiological Response

- GI problems/nausea
- Increase in heart rate and breathing rate
- Skin conductance
- Muscle tension

Related Emotions

Contempt; Disdain; Scorn; Abhorrence; Aversion; Distaste; Revulsion

FUNCTION OF EMOTIONS - HAPPINESS

- It moves us to action
- Is centered around pleasure and reward - when rewarded we seek to continue a behavior
- At the far edge, mania

Physiological Response

- Increase in heart rate and
- Good breathing rate
- Release of endorphins and dopamine

Related Emotions

Excitement; Joy; Relief; Contentment; Bliss; Delight; Amusement; Pride

"The emotions of man are stirred more quickly than man's intelligence"

-Oscar Wilde

THE NEUROSCIENCE OF EMOTION

THE MOOD METER

The Yale Center for Emotional Intelligence

LEVEL OF ENERGY

ENRAGED	PANICKED	STRESSED	JITTERY	SHOCKED	SURPRISED	UPBEAT	FESTIVE	EXHILARATED	ECSTATIC
LIVID	FURIOUS	FRUSTRATED	TENSE	STUNNED	HYPER	CHEERFUL	MOTIVATED	INSPIRED	ELATED
FUMING	FRIGHTENED	ANGRY	NERVOUS	RESTLESS	ENERGIZED	LIVELY	ENTHUSIASTIC	OPTIMISTIC	EXCITED
ANXIOUS	APPREHENSIVE	WORRIED	IRRITATED	ANNOYED	PLEASED	HAPPY	FOCUSED	PROUD	THRILLED
REPULSED	TROUBLED	CONCERNED	UNEASY	PEEVED	PLEASANT	JOYFUL	HOPEFUL	PLAYFUL	BLISSFUL
DISGUSTED	GLUM	DISAPPOINTED	DOWN	APATHETIC	AT EASE	EASY GOING	CONTENT	LOVING	FULFILLED
PESSIMISTIC	MOROSE	DISCOURAGED	SAD	BORED	CALM	SECURE	SATISFIED	GRATEFUL	TOUCHED
ALIENATED	MISERABLE	LONELY	DISHEARTENED	TIRED	RELAXED	CHILL	RESTFUL	BLESSED	BALANCED
DESPONDENT	DEPRESSED	SULLEN	EXHAUSTED	FATIGUED	MELLOW	THOUGHTFUL	PEACEFUL	COMFY	CAREFREE
DESPAIR	HOPELESS	DESOLATE	SPENT	DRAINED	SLEEPY	COMPLACENT	TRANQUIL	COZY	SERENE

PLEASANTNESS

EMOTION AND COGNITION

EMOTION ≠ **COGNITION**

Why is it important?

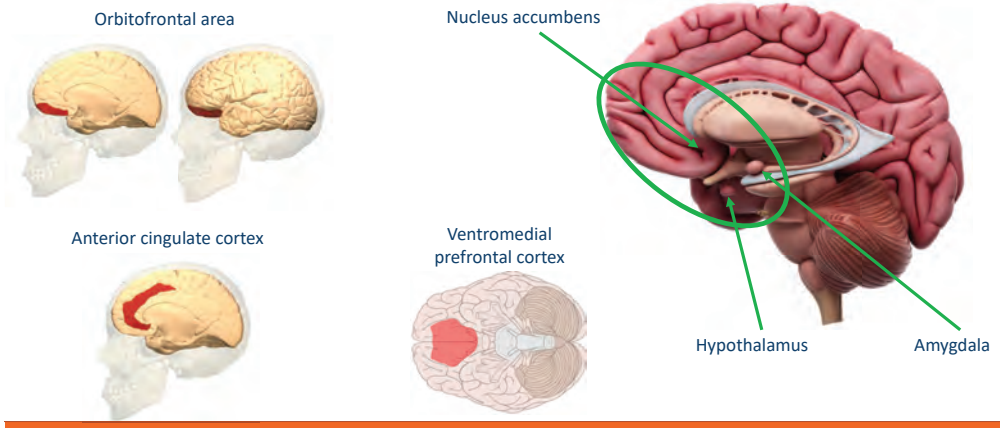
Underlying theory of Emotional Intelligence is that it impacts cognitive processes

EMOTIONS AND BRAIN EVOLUTION

Emotions have to be explained in the context of evolution

- Take the emotion of 'disgust' – for animals disgust evolved so that they could avoid poisons or toxins – it was about survival –animals learned about contaminants by seeing what happened to other animals
- In humans disgust evolved beyond that – not only did we learn by seeing what happened to others, we also learned because others told us to avoid them;

EMOTIONAL BRAIN – CORE STRUCTURES



SUPPORT FOR THE UNDERLYING THEORY OF EQ

- EQ impacted cognition (decision-making) only when emotional stimuli was present
- Information was processed differently, which implicates different neural networks at work

	HOT COGNITIVE TASK (Emotional stimuli or consequences)	COLD COGNITIVE TASK (Emotionally neutral stimuli or consequences)
HIGH EQ	Made more advantageous vs disadvantageous selections * * p < .05	X
LOW EQ	No difference in the advantageous vs disadvantageous selections	

EMOTIONAL BRAIN – ADDITIONAL STRUCTURES

Cerebral Cortex
- Prefrontal cortex
- Anterior temporal lobe
- Anterior insula

- **Deep Brain Structures**
  - Hippocampus
  - Basal forebrain
  - Septum pellucidum
  - Posterior cingulate cortex
- **Brainstem**
  - Periacqueductal gray matter
  - Ventral tegmental area

NEURAL NETWORKS

DIRECT COGNITION
- Executive Control Network (left and right)
- Salience Network
- Language Network
- Explicit Memory Network
- Face-object Recognition
- Working Memory - Executive Function Network

DIRECT EMOTION
- Behavioral Empathy Network
  - Expression of compassion or affective empathy
  - Anterior Insula
- Theory of Mind Network Inferring and reasoning about the beliefs, thoughts and emotions of others
  - Perspective-taking
  - Anterior Temporoparietal Junction

BRAIN STRUCTURES TIED TO EQ

PERCEIVING EMOTIONS

Frontal Lobe

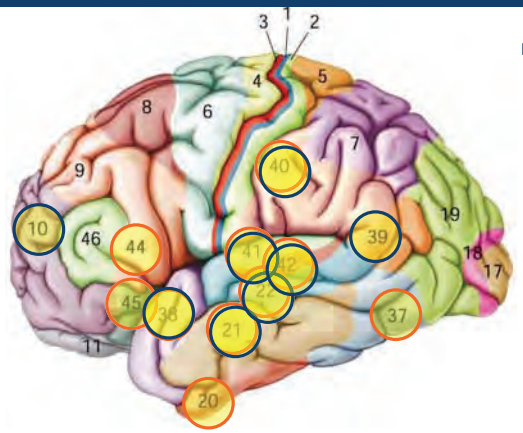
Temporal Lobe

Temporal-Occipital Lobes

Parietal Lobe

White Matter

Left superior longitudinal fasciculus
Left uncinate fasciculus



MANAGING EMOTIONS

Frontal Lobe

Temporal Lobe

Parietal Lobe

EQ - EMOTION REGULATION

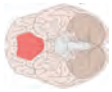
- The set of operations involved in modulating ongoing emotional responses in accordance with individual or social goals
  - vmPFC
  - vlPFC
  - Amygdala

EQ SELF-AWARENESS

STRUCTURES

Anterior insula (AI)

Anterior cingulate cortex (ACC)



Ventromedial prefrontal cortex (vmPFC)

FUNCTION

- **AI** integrates incoming signals about the state of one's own body which are sent to the **ACC**
- The **ACC** initiates selection and planning of motor and non-motor movement responses to emotional events
- Together they play a critical role in generation of subjective emotional experience

Hogeveen, Salvi & Grafman (2016). Emotional Intelligence: Lessons from Lesions. Trends Neurosci. 2016 October ; 39(10): 694–705

EQ SOCIAL AWARENESS (EMOTION RECOGNITION)

- **Amygdala**
  - Emotional facial recognition, via processing emotionally salient exteroceptive stimuli
  - Also assists in the prioritization of the processing salient stimuli
- **vmPFC**
  - Works in conjunction with the Amygdala to detect and represent motivationally salient stimulus events

- **Somatosensory cortex**

- **Insula & ACC**
  - Play a critical role in emotion recognition of pleasant and unpleasant emotion categories
  - These are the same areas that process first-person emotional experiences
  - The "simulation hypothesis"

STIMULUS PROCESSING

EQ SOCIAL AWARENESS (EMPATHY)

AFFECTIVE EMPATHY

- Influences social behavior
- Refers to the ability to share the emotional state of another person
  - vlPFC
  - Insula
- Relies on the ability to prioritize processing of **self** & **other**
  - Temporoparietal junction

EMOTIONAL MEMORY

- Memory of emotional events is superior to memory of other types of events
- They are less likely to fade over time
  - Medial temporal lobe
    - Amygdala
    - Hippocampus
    - Perirhinal cortex

BRAIN EVOLUTION

1. **THE PRIMITIVE BRAIN**

   MEDULLA

   PONS

   MIDBRAIN

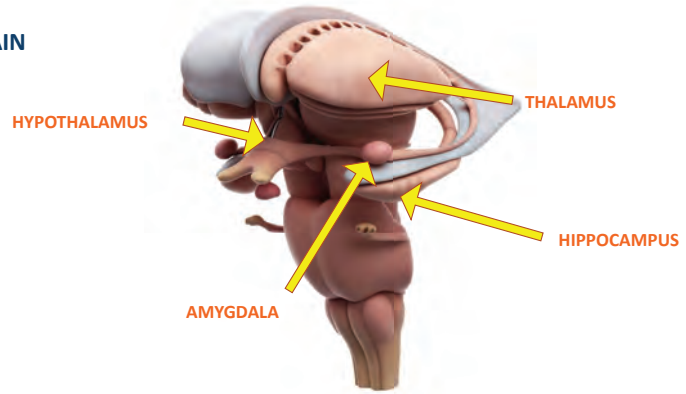
KEY POINTS – BRAIN STRUCTURES & EMOTIONS

- The neural networks for processing emotional stimuli are widely distributed
- The limbic system and the frontal lobe are key regions in the processing of emotional information
- Emotional processing works in close conjunction with cognitive processing

BRAIN EVOLUTION

2. THE EMOTIONAL BRAIN

- Hippocampus
- Amygdala
- Thalamus
- Hypothalamus



STIMULUS PROCESSING - GENERAL

HOW CRITICAL IS THE AMYGDALA TO EMOTIONAL PROCESSING?

CEREBRAL CORTEX – SENSORY PROCESSING

THALAMUS

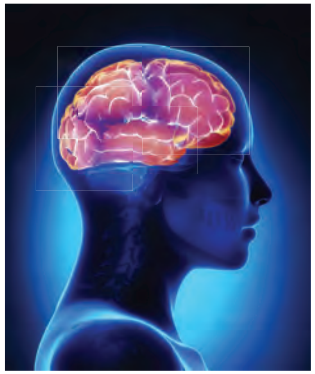
FRONTAL LOBE – RESPONSE INITIATION

AMYGDALA

BRAIN EVOLUTION

3. THE NEOCORTEX

- FRONTAL LOBE
- PARIETAL LOBE
- OCCIPITAL LOBE
- TEMPORAL LOBE



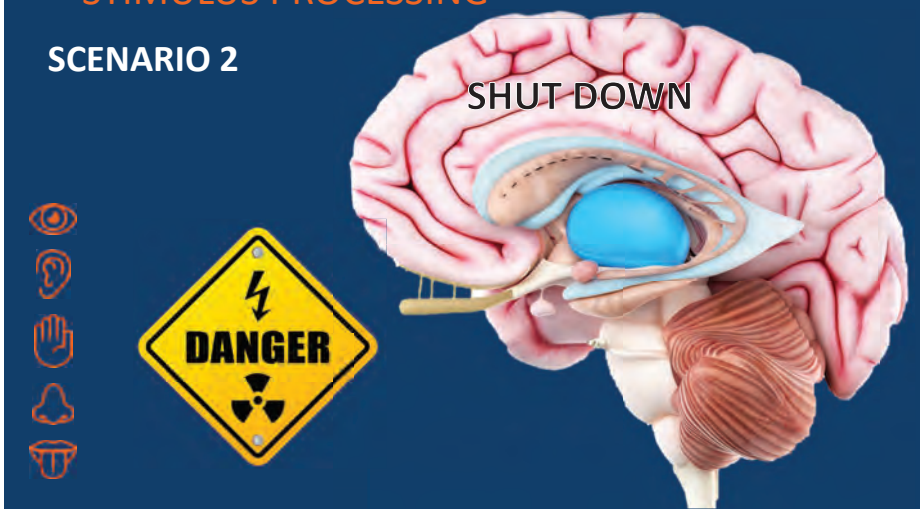
STIMULUS PROCESSING

SCENARIO 1

Danger?

STIMULUS PROCESSING

SCENARIO 2



SO WHERE DOES EMOTIONAL INTELLIGENCE FIT IN?

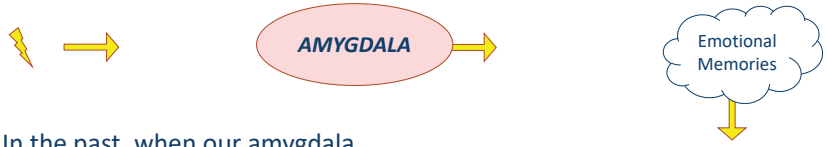
1. The role of the amygdala is to assess incoming stimuli for emotional content
2. When the amygdala detects danger it shuts down the cerebral cortex, and takes over the role of initiating a response
3. Our behavioral response will be determined outside of rational/thinking brain

- For successful social interaction we need to:

1. Be able recognize emotions as they occur
2. Once we experience an emotion, we need to have control over them in order to regulate our responses

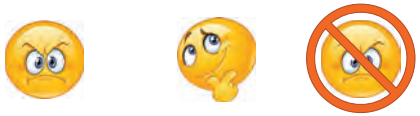
So what happens if the amygdala is wrong?

EMOTIONAL BRAIN & THINKING BRAIN



- In the past, when our amygdala detected some sort of danger, the associated memory was much stronger than other memories
- In the present, the amygdala is assessing new stimuli for threats
- The way it determines danger is to compare the stimulus against emotional memories to see if there is a "match"

Three Scenarios are Possible



EMOTIONAL BRAIN | **RATIONAL BRAIN** | **FALSE POSITIVE**

EMOTIONAL HIJACKING

Emotional Hijacking occurs when the amygdala FALSELY detects dangers, triggers the fight or flight process and shuts down the rational brain

AMYGDALA TURNS EMOTIONAL HIJACK SWITCH "ON"

PREFRONTAL CORTEX = EMOTIONAL HIJACK "OFF" SWITCH

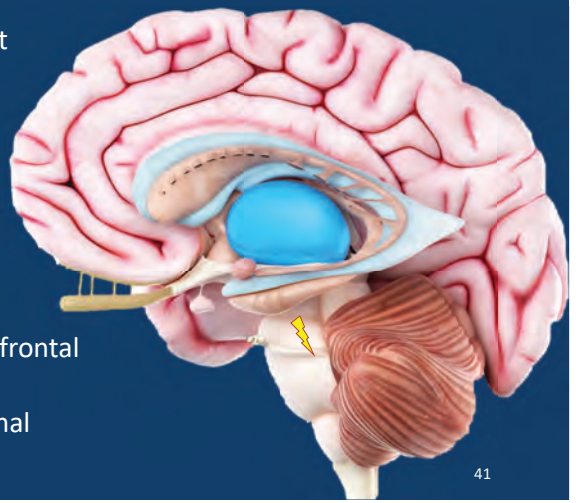
EQ MODELS

EMOTIONAL HIJACKING

- **Amygdala**: initiates flight or flight
- **Hypothalamus**: send out hormones

PROBLEM?

- The amygdala can't generate the response- the frontal lobe has to
- **Amygdala**: sends a signal to the prefrontal cortex
- This is the opportunity for our prefrontal cortex to say "hey wait a minute"
- Last line of defense for an emotional hijacking



DEFINING EQ & EQ MODELS

- *Emotional intelligence(EQ)* refers to an individual's ability to process and respond to emotions, including recognizing the expression of emotions in others, using emotions to enhance thought and decision making, and regulating emotions to drive effective behaviors

COUNTERACTING EMOTIONAL HIJACKINGS

- What stops a hijacking is our understanding that the emotion or intensity isn't appropriate or proportionate given the context of the situation
- In particular a key aspect that informs the context of the situation is our understanding of our emotions in conjunction with our previously learned responses to those emotions
- The key is that some people understand their emotions and have learned how to respond adaptively
- The flip side of that? Some people don't fully understand their emotions and some have not learned how to respond adaptively

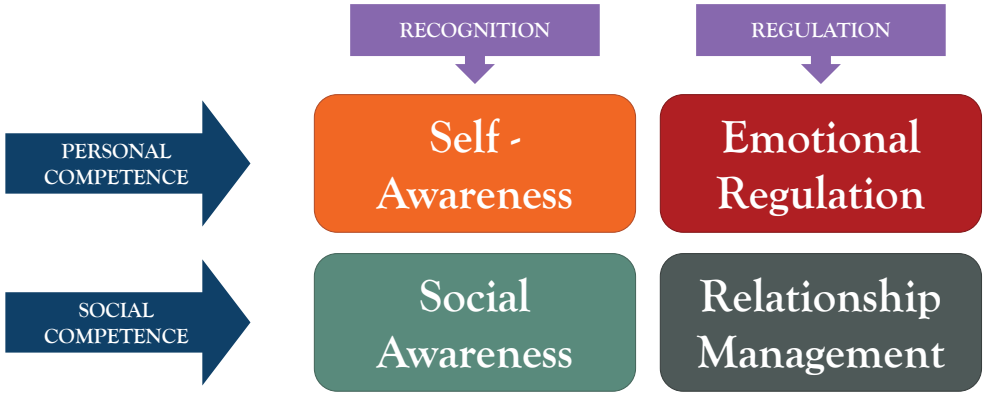
The difference is emotional intelligence

SELF-AWARENESS

"When awareness is brought to an emotion, power is brought to your life"

– Tara Meyer Robson

THE ELEMENTS OF EQ – GOLEMAN'S MODEL



SELF AWARENESS

Concerns knowing one's internal states, preferences, resources, and intuitions

- There are 3 competencies related to Self-Awareness:
  - **Emotional Awareness**: Recognizing one's emotions and their effects
  - **Accurate Self-Assessment**: Knowing one's strengths and limits
  - **Self-Confidence**: A strong sense of one's self-worth and capabilities

ENHANCING EQ

INCREASING SELF-AWARENESS

- Involves paying attention to your emotions
- Simply trying to be more aware of our emotions can help to understand them better
- So the key is recognizing an emotion *as it comes over you*, and understanding *how* that emotion affects you

Click on the line to go to video

http://clg.webflow.io/video/locating-yourself-a-key-to-conscious-leadership

SELF-AWARENESS

	YES	NO
Do you sometimes avoid your feelings and hope they simply go away?	☐	☐
Do you find that some people elicit very negative emotions?	☐	☐
Do you find that when you are in a bad mood, it clouds everything you do?	☐	☐
Do you find that you react differently when you are feeling stressed?	☐	☐

EMOTIONAL REGULATION

"He who angers you conquers you."

– Elizabeth Kenny

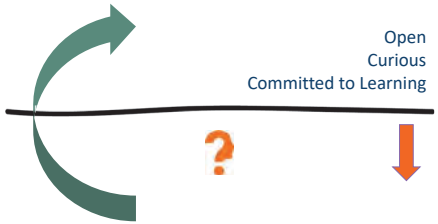
INCREASING SELF AWARENESS

Calm

- Mindfulness is the practice of purposeful attention without judgment
- It is the practice of being aware of present-moment experience without trying to push it away or over-engage

IMPROVING EMOTIONAL REGULATION

- We can't regulate our emotions if we aren't aware of them
- Asking "am I above or below the line" brings the conscious awareness that allows us to then regulate them
- Let's go back to the black line…



EMOTIONAL REGULATION

Refers to managing ones' internal states, impulses, and resources

There are 6 competencies related to Self-Regulation:

- **Emotional Self-Control:** Keeping disruptive emotions and impulses in check
- **Transparency:** Maintaining integrity, acting congruently with one's values
- **Adaptability:** Flexibility in handling change
- **Achievement:** Striving to improve or meeting a standard of excellence
- **Initiative:** Readiness to act on opportunities.
- **Optimism:** Persistence in pursuing goals despite obstacles and setbacks

If self-awareness is a not a current strength, regulating them won't be either.

LOCATION, LOCATION, LOCATION

- The black line is a simple tool to help us bring attention to, and gain awareness of our emotions *as they occur*

Imagine Steve has an interaction with co-worker Jane after an important project deadline was missed

Jane implicates Steve as the reason for the delay

Imagine there are two routes for Steve to address the situation

He can respond without being mindful
He can respond in a mindful way

EMOTIONAL REGULATION

	YES	NO
Do you find that you struggle to respond in a thoughtful way, versus an emotional way?	☐	☐
When someone challenges your emotions, do you see them as a villain or an ally?	☐	☐
Do you find that you don't notice the effects of your actions until it's too late?	☐	☐
Do you visualize yourself succeeding or do you see failure in many situations?	☐	☐

SOCIAL AWARENESS

"Empathy is seeing with the eyes of another, listening with the ears of another and feeling with the heart of another"

– Alfred Adler

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RESPOND WITHOUT BEING MINDFUL

Physically, his heart rate increased, his muscles tensed

His immediate thought is "Jane is always out to get me!"

Steve responds defensively and blames a different department for causing the project delay

CONFLICT

Closed, Defensive, Committed to Being Right

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SOCIAL AWARENESS

Refers to how people handle relationships and awareness of others' feelings, needs, and concerns

- There are 3 competencies related to Social Awareness:
  - **Empathy**: Sensing others' feelings and perspectives, and taking an active interest in their concerns
  - **Organizational Awareness**: Reading a group's emotional currents and power relationships
  - **Service Orientation**: Anticipating, recognizing, and meeting customers' needs

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RESPOND IN A MINDFUL WAY

Physically, his heart rate increased, his muscles tensed

His immediate thought is "Jane is always out to get me!"

Steve says to Jane "I agree the deadline was missed, and part of that may be from our end. Can we problem solve how to fix it, and prevent the issue moving forward?"

COMMUNICATION

Responsive / Curious / Growth & Learning

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INCREASING EMPATHY – ACTIVE LISTENING

- Pay attention!
  - Make eye contact
  - Ignore outside factors
  - Put own thoughts on hold
  - Put the phone down…
  - Stop planning what response
- Provide feedback
  - Ask questions, check in
  - Nod, smile, respond
- Don't interrupt
- Be mindful of your body language
- Practice Active Listening.
  - Listen with your ears – what is being said, and what tone is being used?
  - Listen with your eyes – what is the person doing with his or her body while speaking?
  - Listen with your instincts – do you sense that the person is not communicating something important?
  - Listen with your heart – what do you think the other person feels?

SOCIAL AWARENESS

	YES	NO
Do you feel you are always present when speaking with others?	☐	☐
When you see an acquaintance having a difficult time, do you ask what is wrong?	☐	☐
Do you try and see through others' world lens to understand their point of view?	☐	☐
Are you able to walk into a room and quickly sense the mood?	☐	☐

RELATIONSHIP MANAGEMENT

"Only by knowing ourselves can we responsibly and efficiently manage our senses, thoughts, words and actions, and behave in a benevolent manner toward other beings and the world"

– Joseph Rain

EMPATHY

- In order to be truly empathic, there are four pre-requisites that must be present
  - ✓You must leave judgment behind
  - ✓Try to experience the world through the other person's lens
  - ✓Aspire to understand others' feelings
  - ✓Communicate your understanding of those feelings

RELATIONSHIP MANAGEMENT STRATEGIES

- Be open and be curious
- Enhance your communication style
- Avoid giving mixed signals
- Be open to receiving feedback
- Focus on trust-building
- Have an open door policy
- Don't put off what needs to be addressed
- Use feedback effectively

RELATIONSHIP MANAGEMENT

This is the ability to use awareness of your emotions and the emotions of others to manage interactions successfully

There are competencies related to Relationship Management:

- **Developing Others:** Sensing others' development needs and bolstering their abilities
- **Inspirational Leadership:** Inspiring and guiding individuals and groups
- **Change Catalyst:** Initiating or managing change.
- **Influence:** Wielding effective tactics for persuasion
- **Conflict Management:** Negotiating and resolving disagreements
- **Teamwork & Collaboration:** Working with others toward shared goals; Creating group synergy in pursuing collective goals

THANK YOU!

RELATIONSHIP MANAGEMENT

	YES	NO
People take in more from what they see than what you say. Do you have a poker face?	☐	☐
Are you good at receiving feedback from others?	☐	☐
Are you accessible to your co-workers and people who report to you?	☐	☐
Do you avoid difficult conversations or have trouble initiating difficult conversations?	☐	☐