Emotions, Learning, and Embodied Meaning
Ross Anderson

Intuitively, we know that the body and mind are connected intimately in everything we think, feel, and do. As such, consciousness and meaning are emergent qualities. Every day we arise from a slumber and slowly over several moments recognize the world around us and the bodies we inhabit. We pass through our day reaching moments of both low and high consciousness—from boredom to a flow of heightened concentration. How we make meaning of what we experience and learn is not instant or static nor is this meaning the same thing as objective knowledge.

We know the shape, smell, and taste of an apple and might describe an apple with similar adjectives, but the feeling—the emotional quality—of an apple is unique to each of us. Such feelings, perhaps difficult to put into words, will mark how we apply our sense of an apple in the future.

In fact, the neural mapping in each of our brains that generates the thought of an apple will be different for each of us. These mappings will draw on emotional markers from past experience to create a felt quality of apple, unique to that moment.

Most of the meaning we make of abstractions comes from affective, or emotional, experience. Much of this processing and marking of memories is nonconscious or faintly conscious at best. When we process a feeling cognitively, such as the first raindrops on our skin, we often use metaphor in the way we make sense of and represent the felt quality. When we look at an abstract painting and think, *how stunning*, the neural activation patterns in our brains will likely be nearly identical to the those produced when we actually feel stunned by something that surprises us. We interpret and make sense of the world through metaphors that are felt, that are emotional. (Pause - Slide)

You may be thinking…okay, Ross, I'm picking up what you are putting down, I love the movie *Inside Out,* too, but so what? Well, for centuries, the body-mind dualism governing western civilization has dictated our philosophy in education, too. This behaviorist dualism has been completely at odds with the idea that bodily felt emotions are central to cognitive processing. Even recent ideas distinguishing the left and right brains as purely analytic or creative are dead wrong. We have been indoctrinated with the idea that emotion is a needless distraction to learning. Thus, we have worked hard to remove emotion from the learning process. Fortunately, neuroscience is finally catching up to our intuition, providing new opportunities for education theory and practice.

Affective neuroscience studies the role of the emotions in how the brain processes thinking, feeling, and learning. Recent evidence suggests that emotions mark our memories in neural mappings. These maps connect images to emotional cues that we draw on when we learn, form memories, and apply what we learn in the future.

Social neuroscience studies the role of interacting with others in these same processes that are fundamental to learning. Recent evidence links the way we perceive and internalize the feelings and actions of others with how we embody and understand our own.

Advanced neuroscience theories suggest that neural processes that discern differences in the world around us—including classroom learning—are all biologically grounded to our most basic physiological life-regulatory systems. Thus, learning begins with the most ancient survival systems in our bodies.

Why does a student solve a math problem? From extrinsic praise to self-satisfaction to fear of punishment, the reasons are connected to emotional or social value judgment. As the student calls on knowledge about a math problem and decides on a strategy to solve it, emotions play a critical role at each stage—the *rudder that steers the thinking.* Emotions motivate, recruit, and evaluate the steps toward developing the relevant skill. Even the most seemingly rational and logical learning—mathematics for instance—draws on an intertwined system of cognition and emotion.

Affective neuroscientist and former educator, Helen Mary Immordino-Yang, warns that this research is still too early to create prescribed practices for educators to follow. Yet, she suggests that carrying an awareness of these connections is the first step.

She urges educators to remember these few things in their practice: 1) emotions guide cognitive learning, (2) the way that emotions contribute to learning may be conscious or nonconscious, 3) emotional learning shapes future behavior and recall, 4) emotion is most effective in facilitating the development of knowledge and skill when it is relevant to the task, 5) without emotion, learning is actually impaired (this one is worth repeating). These insights encourage educators and learners to foster emotional connection to learning material as often and as deeply as possible.

Thinking and learning takes place in a feeling body and bodies in early adolescence are in a powerfully evolving and receptive state. It may be that adolescents need more emotional stimuli in the learning process to complement their fast-developing self-awareness and their new capacities to interpret and embody the emotions of others.

References

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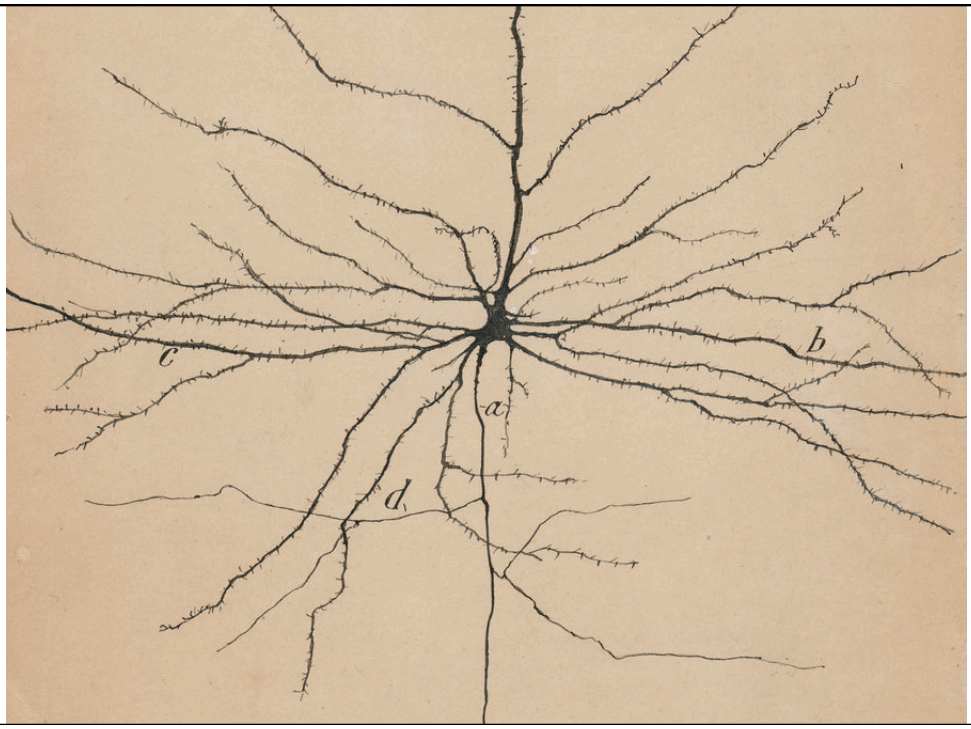
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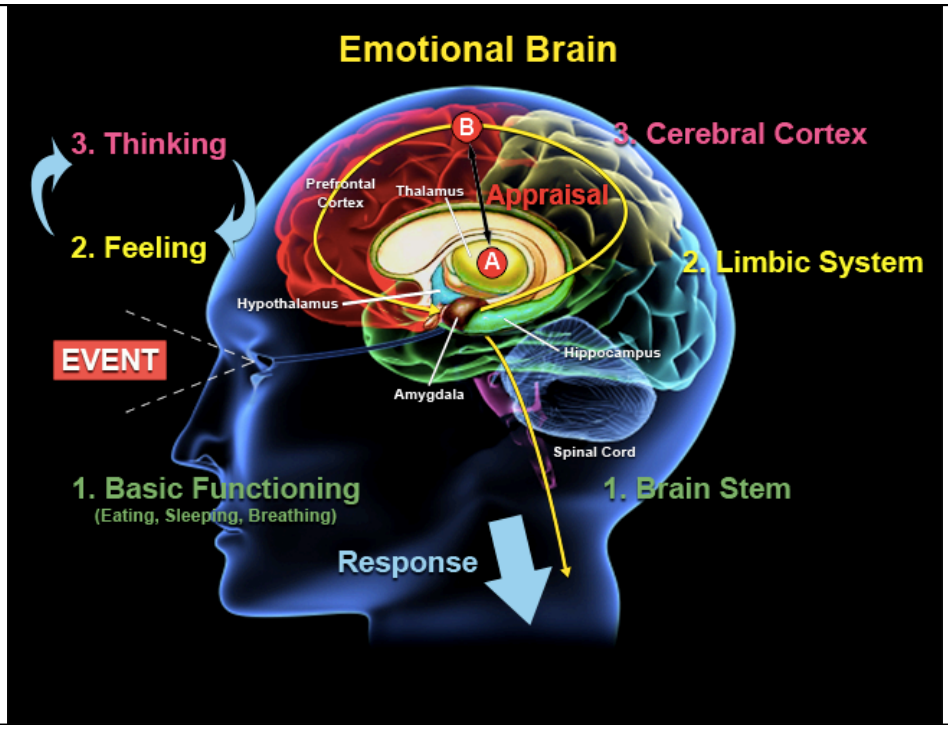
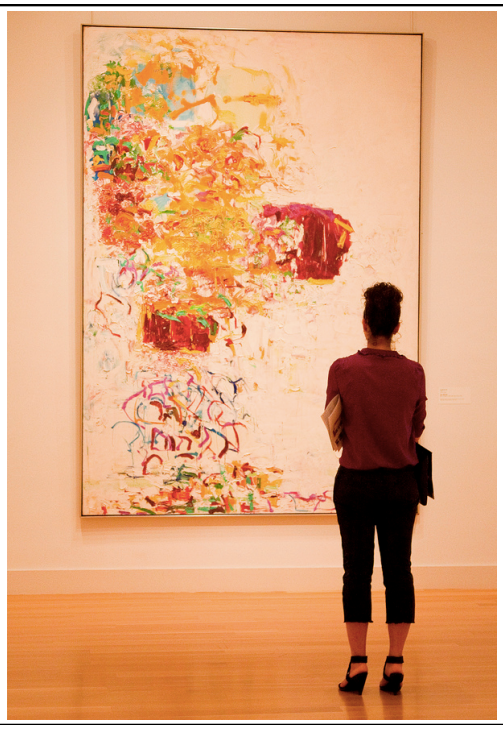
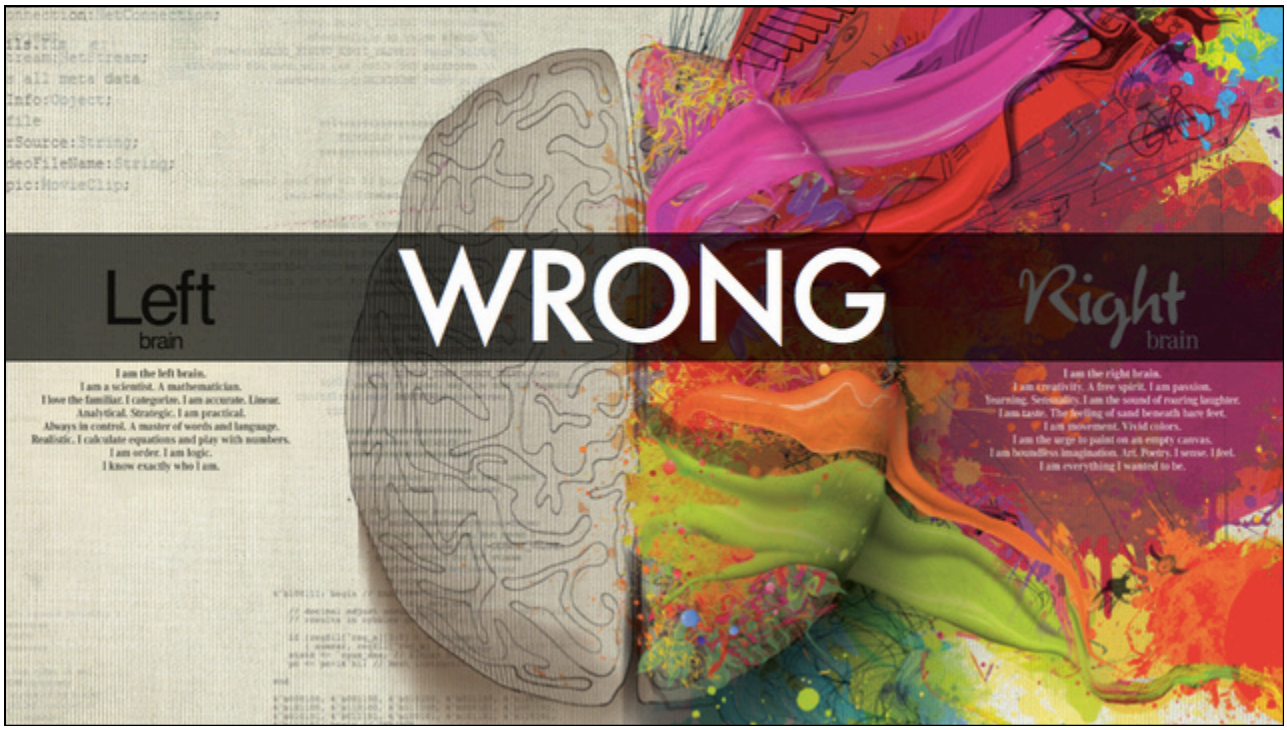
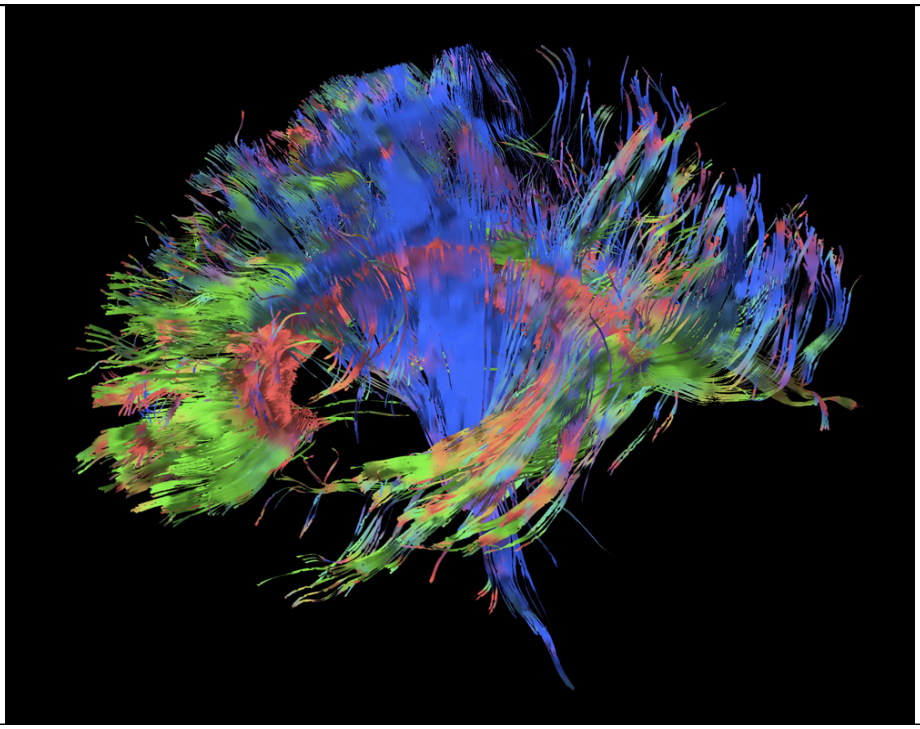
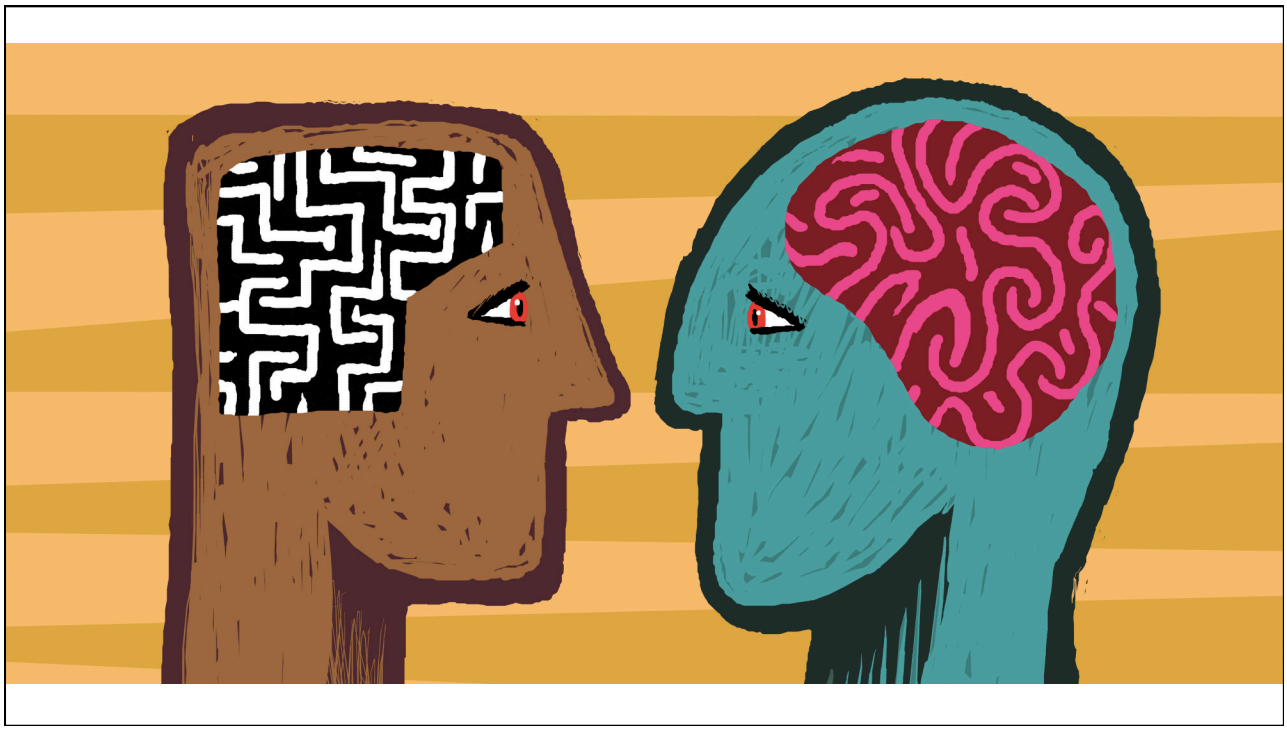
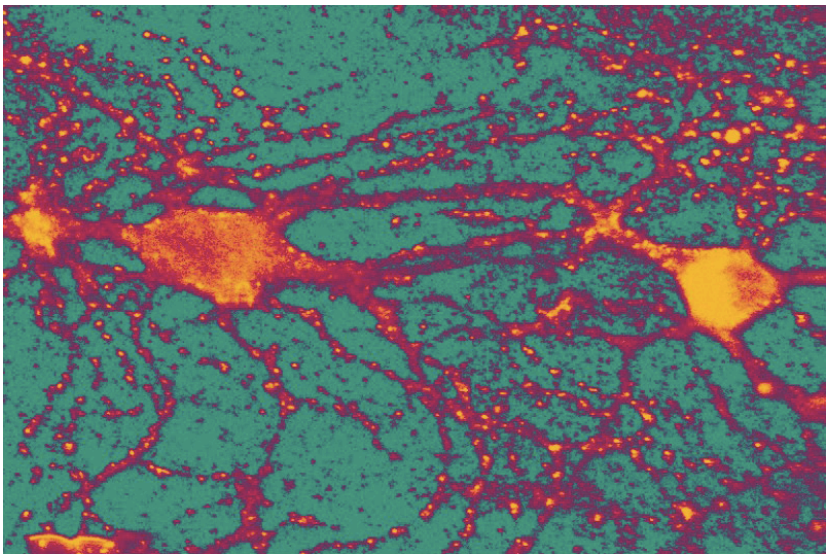

Emotional Brain
3. Thinking
2. Feeling
EVENT
1. Basic Functioning
(Eating, Sleeping, Breathing)
B
A
Prefrontal Cortex
Thalamus
Appraisal
3. Cerebral Cortex
2. Limbic System
Hypothalamus
Hippocampus
Amygdala
Spinal Cord
1. Brain Stem
Response

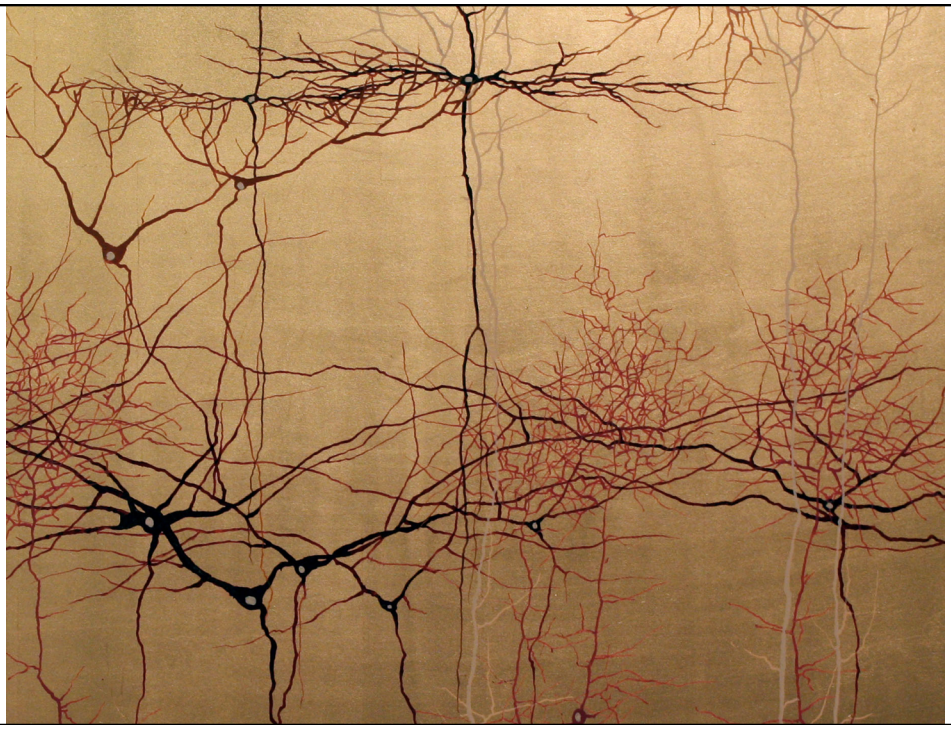



Left
brain
WRONG
Right
brain
I am the left brain.
I am a scientist. A mathematician.
I lose the familiar. I categorize. I am accurate. Linear.
Analytical. Strategic. I am practical.
Always in control. A master of words and language.
Realistic. I calculate equations and play with numbers.
I am order. I am logic.
I know exactly who I am.
I am the right brain.
I am creativity. A free spirit. I am passion.
Yearning. Sensuality. I am the sound of roaring laughter.
I am taste. The feeling of sand beneath bare feet.
I am movement. Vivid colors.
I am the urge to paint on an empty canvas.
I am boundless imagination. Art. Poetry. I sense. I feel.
I am everything I wanted to be.









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