A New Hope: Teaching Critical Thinking 4.0

We are not in an information society. We are in a disinformation society. Many judgments about truthfulness are quick, unconscious and automatic that occurs without our awareness. Practice slowing our thinking down can help us think deliberately and critically to help distinguish fake news from real information.

Current models of critical thinking focus on argumentation fallacies, deduction and education are incomplete. A paradigm shift in critical thinking needs to include psychological aspects of how people actually think, decide, process information and encourage the reevaluation of personal beliefs.

This session provides simple demonstrations to show that thinking can be influenced without your awareness, how to systematically evaluate information in the context of a psychology lesson, and illustrate common errors made by students.

Without including the psychological aspects in critical thinking, we will take the wrong action to distinguish between fake news and real information. Improvements in critical thinking will help people make better choices and support effective public policies.

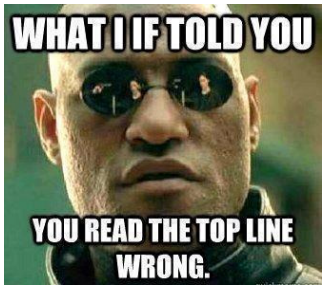
Part A: Why is critical thinking important?

We are not in an information society. We are in a disinformation society. Many judgments about truthfulness are quick, unconscious and automatic that occurs without our awareness. Practice slowing our thinking down can help us think deliberately and critically to help distinguish fake news from real information.

Part B: Why is critical thinking difficult to teach and learn?

Our beliefs about critical thinking

- We have an outdated model of critical thinking—focusing on argumentation fallacies and education. These are important, but it is limited and doesn't take into account how people actually think and decide.
- There is a cultural belief that STEM / technology will solve the world's problems. Psychology needs to be the focus for solving the world's behavioral problems.



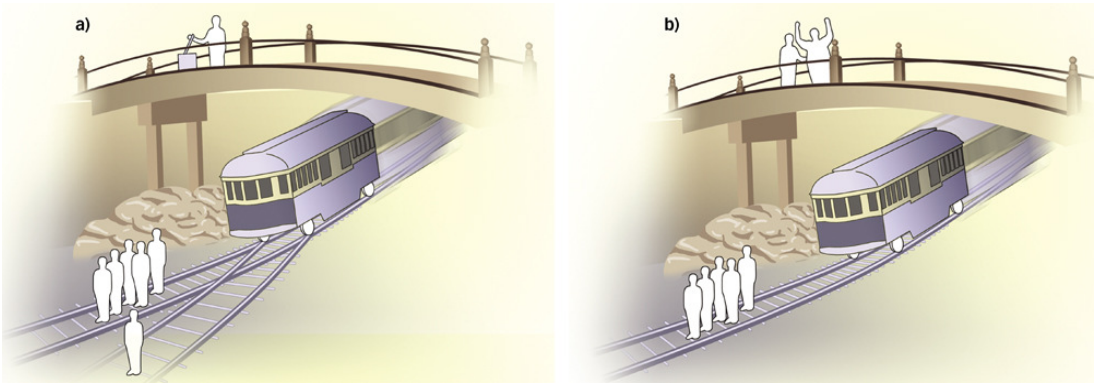
Part B: Why is critical thinking difficult to teach and learn?

We aren't aware of how people really think

- Many thinking processes are unconscious and automatic.
- Beliefs, schemas and mental representations influence our thinking without our awareness.
    - We fail to question our own beliefs that might not be true

- We are unaware of errors we make in thinking and engage in pseudo-critical thinking or cynical thinking.
- We are overconfident and think we are better than average in our ability to think.

- Emotions can impair our ability to think critically—especially if the topic is a threat to our sense of self.
- We make decisions based on feelings and rationalize it later.

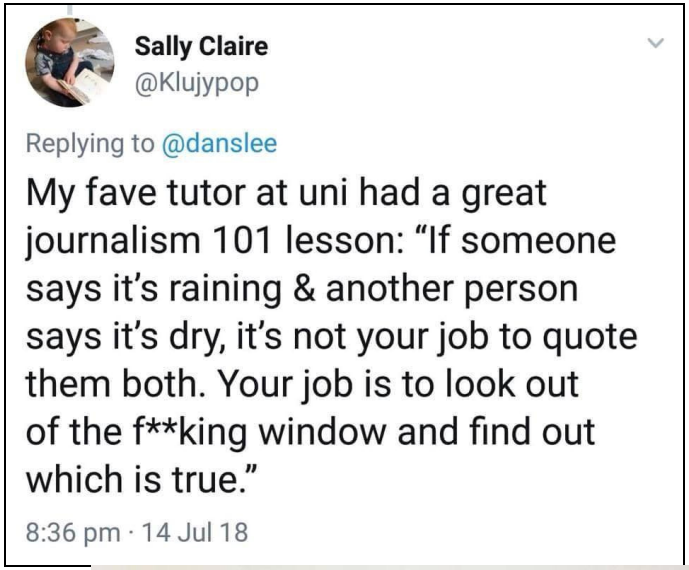


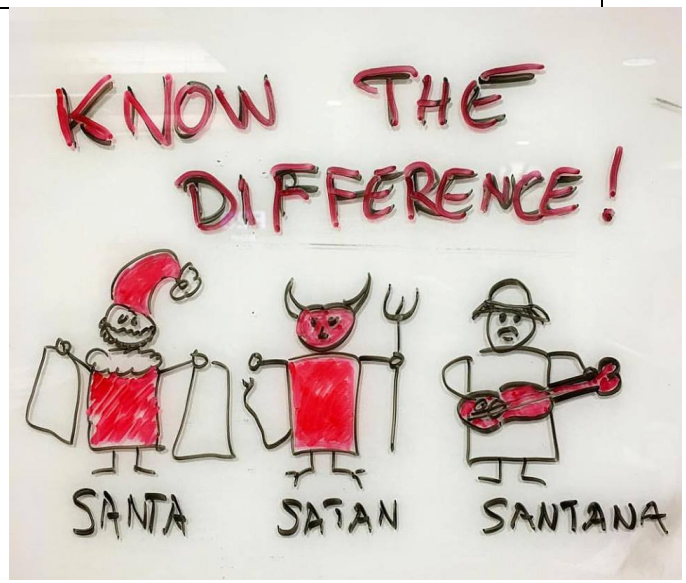
<u>Our educational institutions focus on answers and not thinking processes.</u>

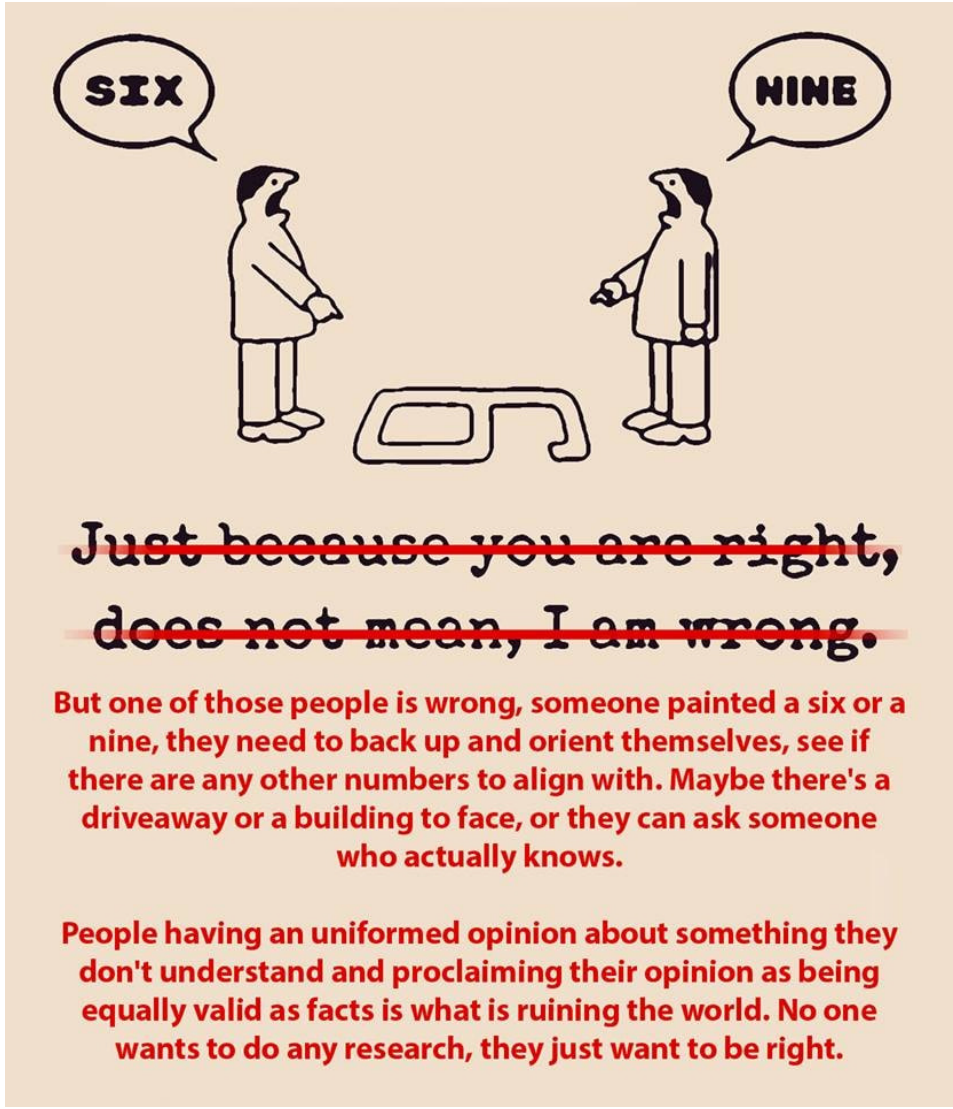
- Many courses and evaluations reinforce answers--whether we are right or wrong--not reason or thinking behind the answer. We need to know the reasons for our decision to analyze thinking processes.
- Instructors reinforce students to quickly answer (see fast thinking) instead of slowing down our thinking processes.

<u>The intentional spreading disinformation, leading to confusion on the facts</u>

It is uncomfortable to be wrong, takes effort to think critically and evaluate information, and need feedback on our thinking.

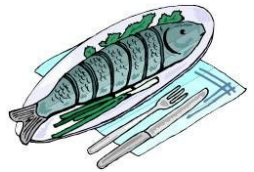






Your Behavior Can be Influenced Without Your Awareness

As an example of how your decisions can be influenced without your awareness, the following comes from an article 3 Obvious and 4 Not So Obvious Ways Buffets Make Money by John-Erik Koslosky, Dec 12, 2013.



1 - Big cost, little portion

Pricier items on the buffet line – like meat or fish – are cut into smaller pieces. Rationally, a person would just take two pieces instead of one. But in reality, a diner is more likely to follow society's unwritten rule, taking a single smaller piece and moving on down the line.

2 - Tricky serving dishes

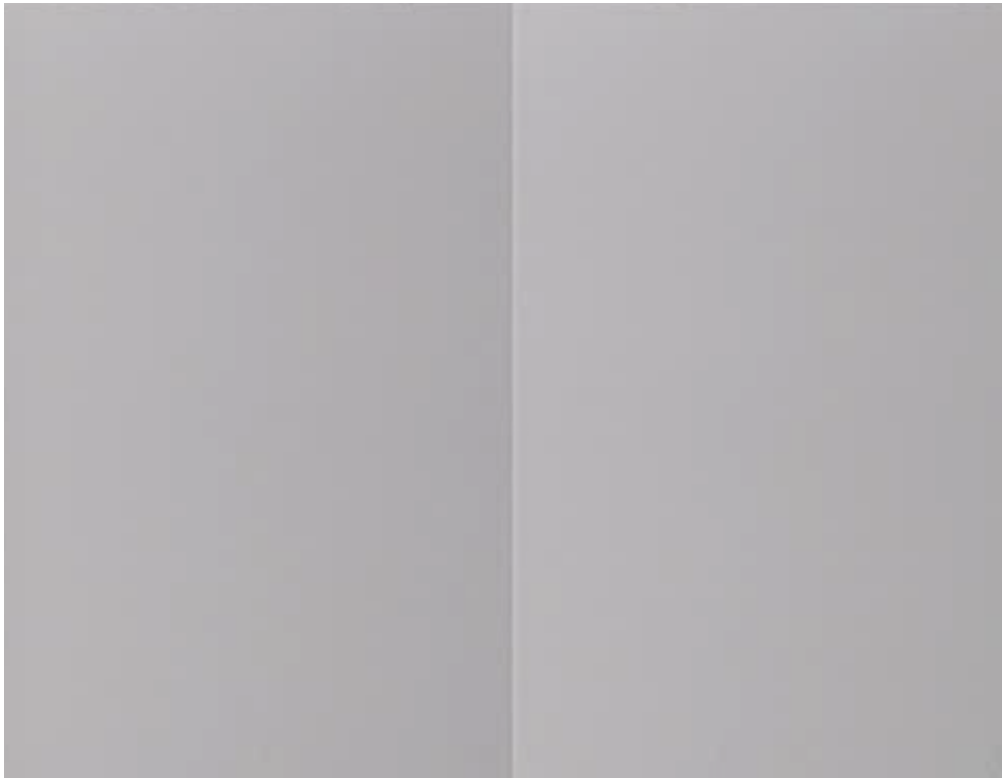
The size of serving dishes further plays on our conscience. If there's a small chafing dish with a few pieces of baked haddock, we're a lot less likely to take more than one piece. At the big, full trays of potatoes and rice, we're more likely to scoop out a heaping spoonful. And those starchy, filling, lower-cost items are often positioned earlier in the line, leaving you with less room on your plate by the time you reach that meat.

3 - Serving utensil subterfuge

If that weren't enough, smaller serving utensils also help reinforce the behaviors that benefit the restaurant. Spoons in the inexpensive starches are big. Tongs, spatulas, or forks used to move more expensive proteins to your plate may be smaller, and less geared toward moving large quantities of food at a time.

Context affects perceptions—boundaries

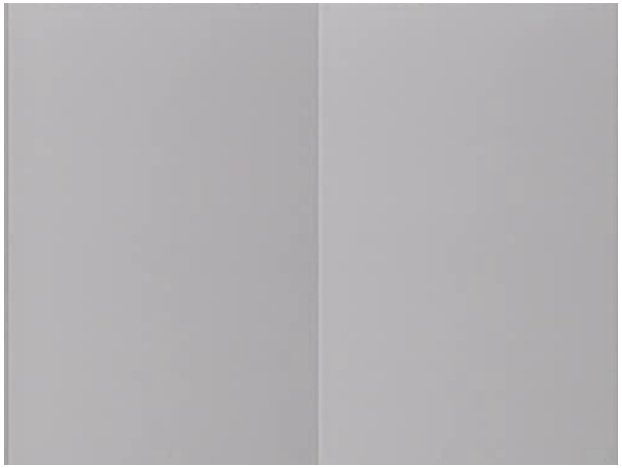
Boundaries can create the perception of differences when they don't exist. The following is a visual illusion from the Discovering Psychology #7: Sensation and Perception at about 20:00 into the video



Most people see two different shades in the left and right side. Now cover up the center line.

Context affects perceptions—boundaries

Boundaries can create the perception of differences when they don't exist.



Boundaries, divisions and categories can exaggerate differences between groups that are quite similar. Men and women are more similar than they are different. The different categories accentuate and focus our attention on the differences.

Math Problems

I am going to do some subtraction problems that you are to answer in your mind.

They take the form

15 minus **4** equals ____

16 minus **10** equals ____
3 minus **3** equals ____
7 minus **2** equals ____

Now quickly pick a number between **12** and **5**

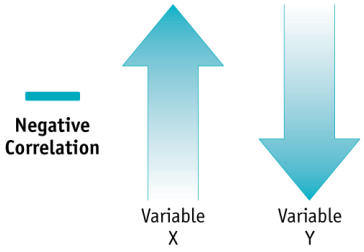
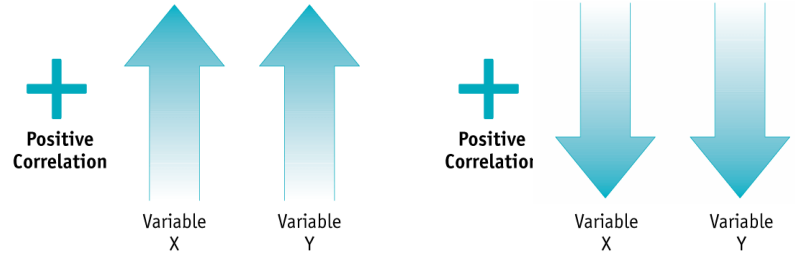
Math Problems

While many people have difficulties seeing how people are influenced in the math problem example, people have little difficulties when you change the context.

1. Where does olive oil come from?
2. Where does coconut oil come from?
3. Where does peanut oil come from?

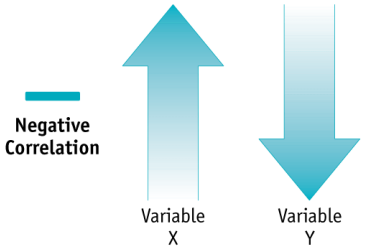
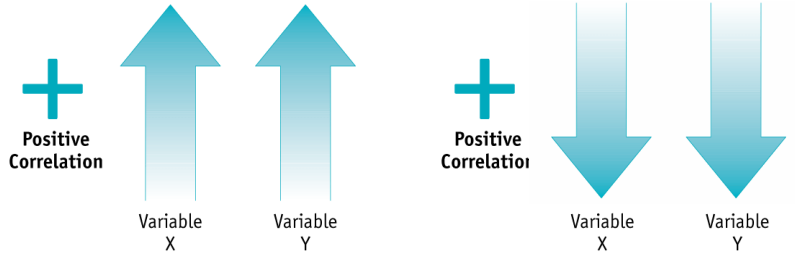
Where does baby oil come from?

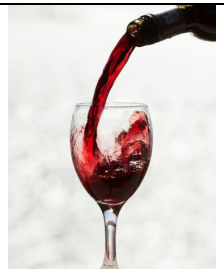
<u>Part D:</u> Systematically evaluating information in the context of a psychology lesson

Negative correlation	Positive correlation
A correlation where the variables act in opposite directions. If one increases, the other decreases.	A correlation where the variables act in the same direction. If one increases, the other increases, if one decreases, the other decreases.
	

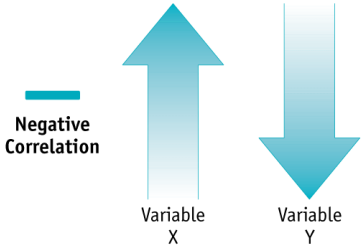
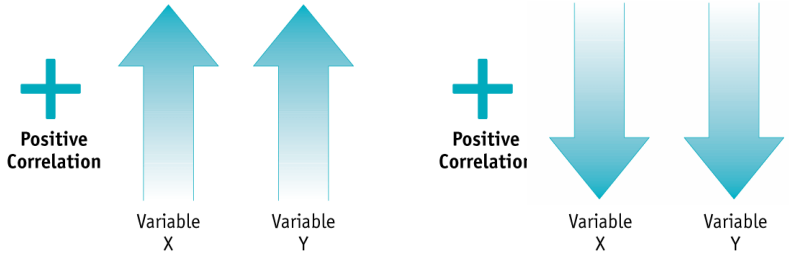
The distance you live to power lines	is associated with	Life expectancy
	**A Third Variable** causes you to live closer to power lines and live shorter lives	

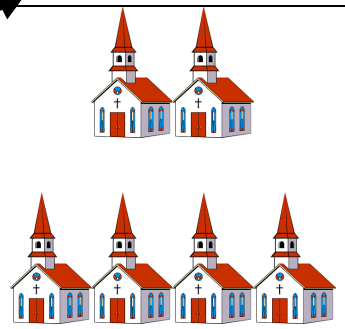
<u>Part D:</u> Systematically evaluating information in the context of a psychology lesson

Negative correlation	Positive correlation
A correlation where the variables act in opposite directions. If one increases, the other decreases.	A correlation where the variables act in the same direction. If one increases, the other increases, if one decreases, the other decreases.
	

Consumption of red wine	associated with	Reduced incidents of heart disease
	A third variable that causes one to drink red wine and have reduce incidence of heart disease	

<u>Part D:</u> Systematically evaluating information in the context of a psychology lesson

Negative correlation	Positive correlation
A correlation where the variables act in opposite directions. If one increases, the other decreases.	A correlation where the variables act in the same direction. If one increases, the other increases, if one decreases, the other decreases.
	

# of alcoholics in town	predicts the	Number of churches in town
	A third variable that causes more alcoholics and more churches	

Experiment or Correlation?

A study was done with some safety equipment. Would the safety equipment interfere with how enjoyable participants engaged in the activity?

Does using a condom interfere with people experiencing pleasure during sex? A study was done that found that that whether or not you use a condom, there is no reported difference in pleasure

- If this is an undergraduate research study, is it more likely this study will be done as an experiment or a correlation?

Before answering the question and just responding, think about the following:

(1) What is an experiment?
(2) What is a correlation?
(3) What is the difference between an experiment and correlation?

Conducting Experiments

How would you conduct an experiment to see if gender causes how many dogs are adopted?

Part D: Systematically evaluating information in the context of a psychology lesson

Many students who have not had anatomy and physiology find this assignment difficult. The difficulties can be reduced if you are systematic in searching for information.

- Have the list of options in front of you. Do not try to answer the items from memory.
- Go through your choices systematically.
- Highlight key terms that suggest you have an answer. Continue through the rest of the list to make sure there are not alternatives.

When giving feedback

- I tell how many items the student has correct
- Check your work systematically.
    - If you wrote hippocampus, does hippocampus suggest the area of the brain damaged?
    - If you wrote hippocampus, does the number you wrote to indicate location match where the hippocampus is located.

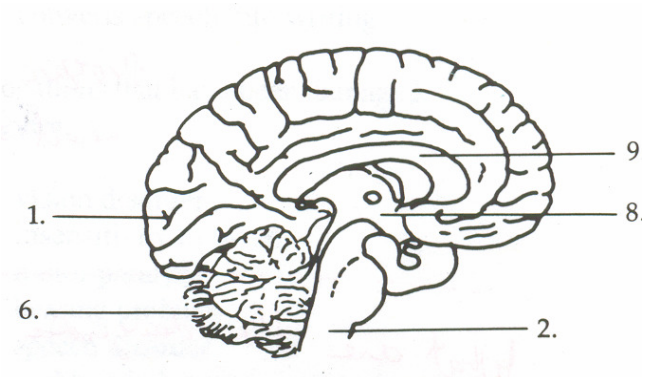
How you arrive at the answer is as important as the answer. Too often we focus on the answer because focusing on how to arrive at the answer and how to find it takes time.

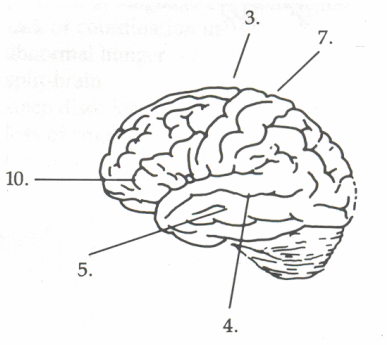
For each disorder that might occur due to brain damage,

(a) Identify the <u>probable brain location damaged</u> (by name). Be as specific as possible when identifying the location (e.g. don't put occipital lobe when primary visual cortex is more appropriate). If you have multiple possibilities, write both down for the time being and eliminate one of them as your possibilities narrow.

(b) After you have done this, identify the general location on the diagram that is damaged (identify it by the number on the diagram). LOOK AT THE DIAGRAM AFTER YOU IDENTIFY THE LOCATION. Each answer is used only once (though 4 and 5 point to essentially the same location). You can eliminate some of the possibilities from part (a).

Change in behavior	**Probable brain location damaged**	**Location on diagram below**
a. vision disorder; tracking movement is not impaired		
b. insensitivity to touch		
c. motor paralysis; inability to control movement		
d. hearing problem		
e. speech disorder		
f. problem in language comprehension		
g. lack of coordination in movement and/or lack of balance		
h. abnormal hunger		
i. split-brain patient		
j. sleep disorder (excessive)		





Hotel Problem

A hotel detective was making his rounds through the corridors of the hotel. As he passed by a room, he heard a voice behind the closed door. The voice yelled, "Don't shoot John!" Immediately afterwards, the detective heard a gun discharge. He immediately broke into the room and encountered the following scene.

A dead woman was lying on the floor. Next to her was a gun. Three people were standing around her. They were a judge, a soldier, and a mail carrier. The detective immediately arrested the mail carrier for murder.

Based on the information provided, how did the hotel detective know to arrest the mail carrier?

If you know the answer, raise your hand, and I will tally how many people know the answer. **DO NOT** reveal how you know the answer. We may need to create a visual representation to help solve the problem.

How does the representation affect your ability to solve the problem?

Primary Motor Cortex and Somatosensory Cortex

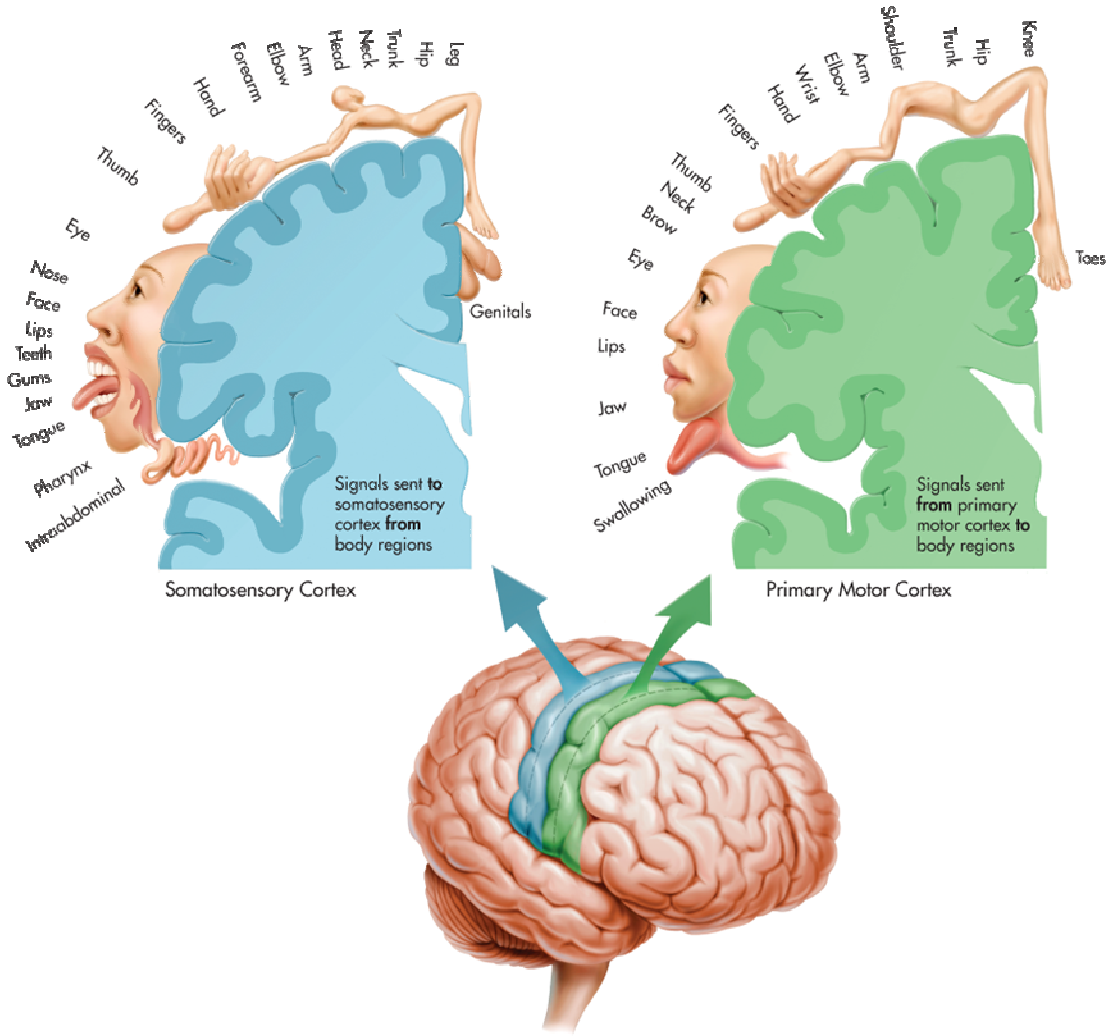


Figure 2.17
Hockenbury/Nolan, *Psychology*, 8e, © 2018 Worth Publishers

(image source: Schacter, Gilbert and Wegner, (2011), Psychology 2nd edition)

Part E: Common Errors made by Students / pseudo-critical thinking

- We engage in pseudo-critical thinking
  - We commit the confirmation bias
  - We become cynical rather than critical
- We use emotions to guide us instead of thinking
  - We engage in post-decisional dissonance
- We use mental representations and schemas to guide our thinking
  - We use the representative heuristic to judge likelihood

Part F: Conclusion

Teaching critical thinking is difficult. Most of the discussions I have seen revolve around the importance of teaching critical thinking or defining critical thinking,

- but not how to do teach it,
- the institutional barriers to critical thinking,
- or the errors people make when thinking.

We need to have a more expansive discussion about critical thinking and how to teach it.

There needs to be a cultural shift in how we think about critical thinking. To improve critical thinking,

- Critical thinking needs to go beyond argumentation fallacies and information
- We teach need to move away from encouraging students to answer quickly toward a slow and deliberative thinking process on how to arrive at the answer.
- Psychologists need to pull critical thinking into their department because critical thinking needs to focus on how people think, remember and make decisions, the errors they make, and how emotions influence thinking.