

Metacognition, or a summary of human failings

Adapted from Brown, Roediger and McDaniel, *Make It Stick*.

... As we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns – the ones we don't know we don't know. And if one looks throughout the history of our country and other free countries, it is the latter category that tend to be the difficult ones. – Donald Rumsfeld, 2002.

Metacognition refers to our awareness and understanding of one's own thought process. It can refer to our self-assessment of how our mind works or to our opinion of our own knowledge. And it turns out... humans have well-documented shortcomings in this area. In particular, humans are vulnerable to many “Illusions and memory distortions.” Some of the examples summarized in *Make It Stick* are:

Hunger for narrative

- We have a hunger for narrative and shape our memories around this
- Studies have shown that overhearing one side of a conversation (eg: an overheard phone call) is more distracting than overhearing a complete conversation
- Jacoby, Bjork and Kelley found (in a meta-study) that it is nearly impossible for humans to avoid judgments based on subjective experience

Imagination inflation

- The act of vividly imagining an event can lead to a false memory of the event
- For more examples of this phenomenon and its explosive impact in the legal world, see the research of Elizabeth Loftus

Suggestion

- Leading or suggestive language influences judgment and recall
- In one study, people estimated the speed of a car differently depending on the wording of the question presented

Interference

- We mix things up, especially in close proximity
- Psychologist Donald Thomson was arrested for assault after the victim confused him (on television being interviewed during the assault) with her assailant

Curse of knowledge

- The better we are at a skill, the worse we are at estimating how long someone else will take to learn it
- Clearly an important failing to be aware of as a teacher!

Feeling of knowing

- Familiar accounts can be mistaken for true

- Stephen Colbert's "Truthiness": a quality characterizing a "truth" that a person making an argument or assertion claims to know intuitively "from the gut" or because it "feels right" without regard to evidence, logic, intellectual examination, or facts.

Fluency illusions

- We tend to mistake fluency of a text for mastery of its content
- Students often work to memorize the language and phrasing of a text rather than understanding the underlying ideas.

Social influence

- We match our memories to those of our peers
- If a friend adds a false detail to a story during a group reminiscence, you will tend to add this detail to your own memory and later remember the experience with the incorrect detail
- One person's error can "infect" another person's memory (however, a more accurate account could improve yours)

False consensus

- We tend to assume everyone agrees with us, unless shown otherwise through actual communication
- False consensus in public speaking: "We all dislike _____, *right?*"

"Unskilled and unaware of it" - the Dunning-Kruger Effect

- Incompetent people overestimate their own competence and see no need to improve
- In an experiment, poor students overestimated their competence, *even after seeing the responses of more competent students!* It was only after receiving training in a given skill that students began to assess their own abilities more accurately.

Tools and habits for calibrating your judgment

- **Testing** and retrieval practice help verify knowledge
- Cumulative, or "frequent, low-stakes" **quizzing** is valuable in an academic setting
- **Peer instruction:** have students instruct and problem solve in small groups
- **Cues:** can you explain a text in your own words?
- **Feedback** from instructors or **peer review**
- **Simulation** (where relevant)