

Today

I. Last Time

II. MRI and fMRI

III. Progress and challenges in probing the human brain

IV. Scott H. Young's Metalearning First Draw a Map

(see scotthyoung.com/)

I.*Talked about final chapter in B. Carey's "How We Learn", the foraging brain, we don't know a full architecture of learning. The fact that it's not a done subject makes it nice to approach from many disciplines.

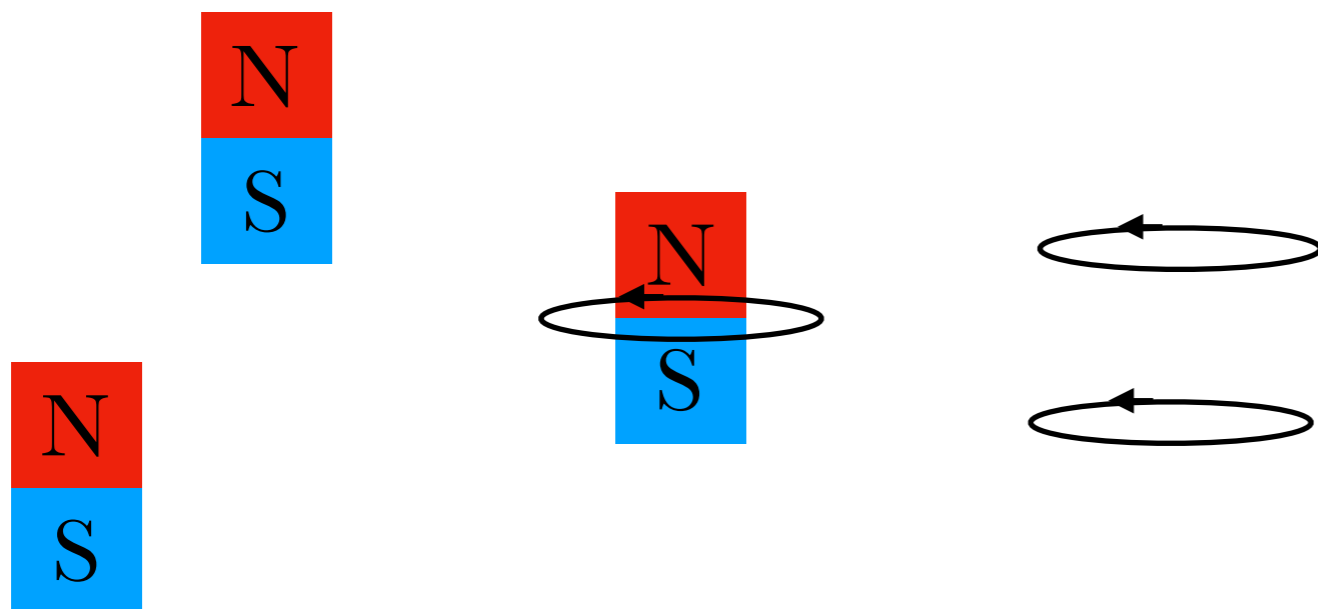
*The myth of learning styles (Willingham). It is true that different people have different natural abilities, but a much more dominant effect is to tailor the presentation of material to the material itself.

*Breaking down constructs, e.g. mathematical learning.

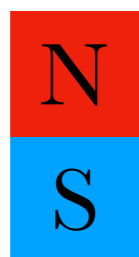
*Context dependence of how the brain behaves.

Magnetism: The greeks found lode stones. These were the ancient correspondents of modern day magnets. Magnetism shows up quite often in iron. The easiest way to make a magnet is to run an electrical current.

Current in this wire loop,
Running counter clockwise



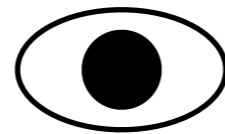
An everyday magnet is just a large collection of atoms, each one of which acts like a little magnet. If those tiny magnets align, we get a magnetic material, like magnetized iron.



In fact the material magnets you've played with are just a huge collection of little current loops.

An atom looks roughly as follows:

Electrons orbit
around the nucleus.



The center of the
atom is the nucleus.

Today we'll focus mostly on hydrogen, which has a nucleus consisting of a single proton with a single electron orbiting around it.

The human body consists of 70-75% water. Water is chemically H_2O . This means that a huge fraction of our body is made out of hydrogen.

You mostly read about fMRI=functional MRI. In functional MRI you look for the magnetic signatures of increased blood flow and this gives you a way to look for that part of the brain activating.

What were your reactions to “Progress and challenges in probing the human brain”?

Hard. Also hard to extract conclusions. Interesting discussion of ethics.

Interesting to think about using this in courtrooms and in brain disorders.

IV. Reactions to the Scott Young reading:

Useful tools: Concepts/Facts/Procedures Map. The amount of time that you should devote to planning.

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Oscillating between planning and practice. When skill acquisition meets reality we often need to re-plan.

Intrinsic vs. instrumental motivations for learning.

The language learning ideas around meta-learning vs. learning directly.

Gabriel Wyner “Fluent Forever”, International phonetic alphabet.