Barrett, Lisa Feldman (2020). *Seven and a half lessons about the brain*. Boston, MA: Houghton, Mifflin, Harcourt.

Outline (9/2/2025)

Lesson 4: Your Brain Predicts (Almost) Everything You Do

Your view of the world is no photograph. It's a construction of your brain that is so fluid and so convincing that it appears to be accurate. But sometimes it's not. (p. 51)

Luckily, your brain has an additional source of information at its disposal: memory. Your brain can draw on your lifetime of past experiences—things that have happened to you personally and things that you've learned about from friends, teachers, books, videos, and other sources. In the blink of an eye, your brain reconstructs bits and pieces of past experience as your neurons pass electrochemical information back and forth in an ever-shifting, complex network. Your brain assembles these bits into memories to infer the meaning of the sense data and guess what to do about it. (pp. 51-52)

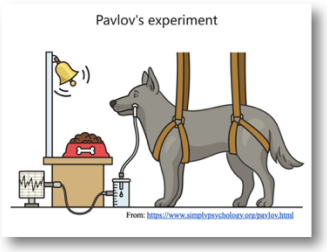
Once again, your brain recreates the past from memory by asking itself, The last time I encountered a similar situation, when my body was in a similar state and was preparing this particular action, *what did I see next? What did I feel next?* The answer becomes your experience. In other words, your brain combines information from outside and inside your head to produce everything you see, hear, smell, taste, and feel. (p. 52)

Your brain actively constructs your experiences. (p. 54)

Neuroscientists like to say that your day-to-day experience is a carefully controlled hallucination, constrained by the world and your body but ultimately constructed by your brain. It's not the kind of hallucination that sends you to the hospital. It's an everyday kind of hallucination that creates all your experiences and guides all your actions. It's the normal way that your brain gives meaning to your sense data, and you're almost always unaware that it's happening. (pp. 55-56)

This whole constructive process happens predictively. Scientists are now fairly certain that your brain actually begins to sense the moment-to-moment changes in the world around you before those light waves, chemicals, and other sense data hit your brain. The same is true for moment-to-moment changes in your body—your brain begins to sense them before the relevant data arrives from your organs, hormones, and various bodily systems. (p. 56)

[The Russian physiologist, Ivan Pavlov] didn't realize that he was discovering how brains predict. His dogs were not reacting to the sound by drooling. Their brains were predicting the experience of eating food and preparing their bodies in advance to consume it. (p. 57)



In a very real sense, predictions are just your brain having a conversation with itself. A bunch of neurons make their best guess about what will happen in the immediate future based on whatever combination of past and present that your brain is currently conjuring. Those neurons then announce that guess to neurons in other brain areas, changing their firing. (p. 57)

Your brain issues predictions and checks them against the sense data coming from the world and your body. What happens next still astounds me, even as a neuroscientist. If your brain has predicted well, then your neurons are *already firing* in a pattern that matches the incoming sense data. That means this sense data itself has no further use beyond confirming your brain's predictions. What you see, hear, smell, and taste in the world and feel in your body in that moment are completely constructed in your head. By prediction, your brain has efficiently prepared you to act. (p. 58)

Now here's the final nail in the coffin of common sense: All this predicting happens *backward* from the way we experience it. You and I seem to sense first and act second. You see an enemy and then raise your rifle. But in your brain, sensing actually comes second. Your brain is wired to prepare for action first, like moving your index finger onto a trigger and making body-budgeting changes to support that movement…Yes, your brain is wired to initiate your actions before you're aware of them. That is kind of a big deal. (pp. 58-59)

Lesson 5: Your Brain Secretly Works with Other Brains

Part of being a social species, it turns out, is that we regulate one another's body budgets—the ways in which our brains manage the bodily resources we use every day. (p. 63)

Ultimately, your family, friends, neighbors, and even strangers contribute to your brain's structure and function and help your brain keep your body humming along. This co-regulation has measurable effects. Changes in one person's body often prompt changes in another person's body, whether the two are romantically involved, just friends, or strangers meeting for the first time. (p. 64)

We live longer if we have close, supportive relationships with other people…we do better at our jobs when we work with peers and managers whom we trust. (pp. 64-65)

We may be healthier and live longer if we have close relationships, but we also get sick and die earlier when we persistently feel lonely—possibly years earlier, based on the data. (p. 65)

Humans are unique in the animal kingdom, however, because *we also regulate each other with words*. A kind word may calm you, as when a friend gives you a compliment at the end of a hard day. A hateful word from a bully may cause your brain to predict threat and flood your bloodstream with hormones, squandering precious resources from your body budget. (p. 66)

Your nervous system can be perturbed not only across distances, but also across the centuries. If you've ever taken comfort from ancient texts such as the Bible or the Koran, you've received body-budgeting assistance from people long gone. (p. 66)

Why do the words you encounter have such wide-ranging effects inside you? Because many brain regions that process language *also control the insides of your body*, including major organs and systems that support your body budget. These brain regions, which are contained in what scientists call the "language network," guide your heart rate up and down. They adjust the glucose entering your bloodstream to fuel your cells. They change the flow of chemicals that support your immune system. The power of words is not a metaphor. It's in your brain wiring…Words, then, are tools for regulating human bodies. Other people's words have a direct effect on your brain activity and your bodily systems, and your words have that same effect on other people. Whether you intend that effect is irrelevant. It's how we're wired. (p. 67)

The best thing for your nervous system is another human. The worst thing for your nervous system is also another human. This situation leads us to a fundamental dilemma of the human condition. Your brain needs other people in order to keep your body alive and healthy, and at the same time, many cultures strongly value individual rights and freedoms. Dependence and freedom are naturally in conflict. (p. 69)