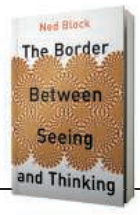
COGNITIVE SCIENCE

Seeing fast and thinking slow

A philosopher explores perception and cognition

The Border Between Seeing and Thinking
Ned Block
Oxford University Press, 2023. 560 pp.



By **Chaz Firestone** *and* **Ian Phillips**

Seeing is not believing, contrary to what popular idioms might claim. But what exactly is the difference? This question is the focus of *The Border Between Seeing and Thinking*, the long-awaited monograph by philosopher Ned Block.

The book's central theme is on display even before the first page: The cover features Akiyoshi Kitaoka's "rotating snakes" illusion—a psychedelic array of circles that appear to be moving, even though you know they cannot be. What you think about the circles differs from how you see them.

Do we "see" a face as happy or sad? Or do we see facial features and then "know" the person is happy or sad?

Precisely characterizing this difference is notoriously difficult, however. Imagine picking up your child from school. Light reflects off their face into your eyes. Their smile is broad, their eyebrows raised; you get the impression that they are happy. Why? Eventually, you work it out—they got their grades today and must have done well. But where did seeing end and thinking begin? Did you see your child's face as happy? Or did you only see their facial features and then infer what emotion they expressed? (Knowing which of your brain regions were active will not be enough to answer this question. That would require first establishing which activations counted as sight and which as thought, which turns on the very distinction at issue.)

Block proposes that we seek empirical "signatures" distinctive of seeing to adjudicate tricky cases. For example, seeing (unlike thinking) is extraordinarily fast: Open your eyes, and immediately you see your surroundings. By contrast, a scientist tasked with inferring your environment from your retinal input would need days.

Another signature is "pop-out": A lone red flower is easy to spot in a field of blues. But what about a single prime number in an array of nonprimes? Block doubts there is cognitive pop-out for the prime.

Block argues that the most important signature is adaptation. Stare at a blue surface for a minute, and what you see next looks yellower (blue's "opponent" color). Likewise, watching rightward motion makes stationary objects seem to move leftward. Block contends that adaptation is unique to perception: Thinking about blue does not somehow bias later thoughts yellow-ward.

Can this signature decide the tricky case of facial emotions? In Block's hands, the question becomes: Do happy faces cause adaptation? The remarkable answer is yes—staring at happy faces makes neutral faces look angry (*1*). Voilà: A scientifically grounded method to distinguish seeing and thinking (assuming that no cases of "cognitive adaptation" emerge to complicate matters).

Another puzzle Block pursues is whether we must be able to think about something in order to see it—a philosophical position known as conceptualism. Here, Block makes creative use of developmental psychology. Infants can see colors, as revealed by their tendency to look at an odd color out in an otherwise uniform array. But Block argues that the ability to conceptualize color only arises later. Infants who see colors just fine do not learn regularities about colors nor do they notice if objects magically change color (*2*). Block concludes that they cannot think about the colors they see; seeing is "nonconceptual." Of course, it is possible that infants can think about colors but just don't; and it is perhaps risky to generalize from infant color vision to vision tout court. But this is a fruitful inroad to a vexed philosophical issue.

Central to Block's project is an account of perception's underlying nature, explaining its distinctive signatures and content. For Block, perception fundamentally differs from thought in format. Consider how the same idea can be represented in different ways: A cat on a mat can be represented linguistically ("Fluffy is sitting on our Persian rug") or pictorially (a photograph of Fluffy atop the rug in question). Block argues that perception's format is exclusively picturelike, or iconic.

This allows perception to be rich and detailed. But a certain expressive power is absent from perception. For example, whereas language can represent disjunctions ("Fluffy is either on the rug or in the yard"), one cannot depict disjunctive scenarios. However, we should distinguish between vision using iconic representations and always being iconic. There is evidence that we perceive causal relations, high-level categories, and even possibilities (*3*); it is not obvious how iconic formats can accommodate this.

The great virtue of Block's discussion is its blending of philosophy and science, instigating an exciting empirical agenda to test his claims. Does cognition never adapt? Do all perceptual properties adapt? Do Block's signatures generalize to nonhuman animals, artificial systems, or other senses? Can iconicity account for the full breadth of visual representation? Whatever the answers, Block's approach offers deep insight into two fundamentally different aspects of mind. ■

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