## "SEEING-THAT" VERSUS "REASONING-WHY"

Two years before Scott and I ran the dumbfounding studies I read an extraordinary book that psychologists rarely mention: *Patterns, Thinking, and Cognition*, by Howard Margolis, a professor of public policy at the University of Chicago. Margolis was trying to understand why people's beliefs about political issues are often so poorly connected to objective facts, and he hoped that cognitive science could solve the puzzle. Yet Margolis was turned off by the approaches to thinking that were prevalent in the 1980s, most of which used the metaphor of the mind as a computer.

Margolis thought that a better model for studying higher cognition, such as political thinking, was lower cognition, such as vision, which works largely by rapid unconscious pattern matching. He began his book with an investigation of perceptual illusions, such as the well-known Muller-Lyer illusion (figure 2.2), in which one line continues to look longer than the other even after you know that the two lines are the same length. He then moved on to logic problems such as the Wason 4-card task, in which you are shown four cards on a table.[31] You know that each card comes from a deck in which all cards have a letter on one side and a number on the other. Your task is to choose the smallest number of cards in figure 2.3 that you must turn over to decide whether this rule is true: "If there is a vowel on one side, then there is an even number on the other side."

Everyone immediately sees that you have to turn over the E, but many people also say you need to turn over the 4. They seem

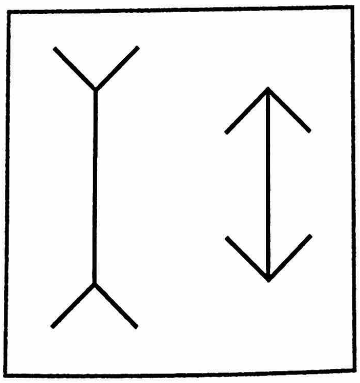

FIGURE 2.2. *The Muller-Lyer illusion.*

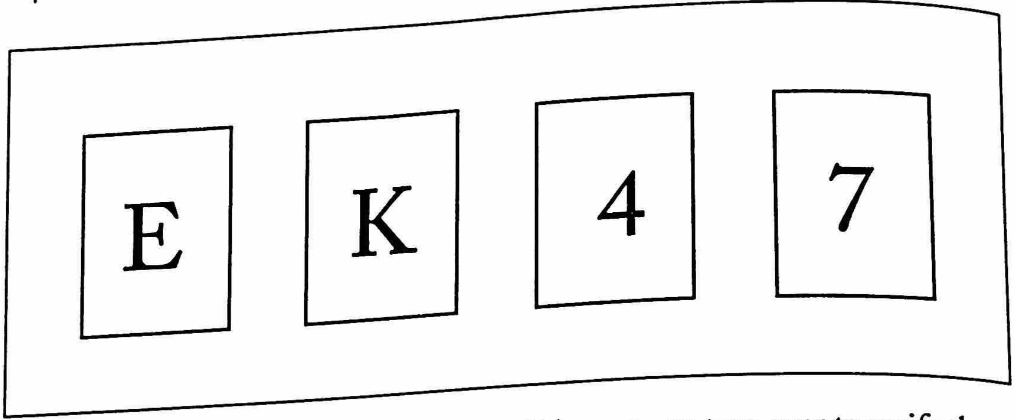


FIGURE 2.3. *The Wason 4-card task.* Which card(s) must you turn over to verify the rule that if a card shows a vowel on one face, then it has an even number on the other?

to be doing simple-minded pattern matching: *There was a vowel and an even number in the question, so let's turn over the vowel and the even number.* Many people resist the explanation of the simple logic behind the task: turning over the 4 and finding a B on the other side would *not* invalidate the rule, whereas turning over the 7 and finding a U would do it, so you need to turn over the E and the 7.

When people are told up front what the answer is and asked to explain why that answer is correct, they can do it. But amazingly, they are just as able to offer an explanation, and just as confident in their reasoning, whether they are told the right answer (E and 7) or the popular but wrong answer (E and 4).[32] Findings such as these led Wason to the conclusion that *judgment and justification are separate processes.* Margolis shared Wason's view, summarizing the state of affairs like this:

> Given the judgments (themselves produced by the non-conscious cognitive machinery in the brain, sometimes correctly, sometimes not so), human beings produce rationales they believe account for their judgments. But the rationales (on this argument) are only ex post rationalizations.[33]

Margolis proposed that there are two very different kinds of cognitive processes at work when we make judgments and solve problems: "seeing-that" and "reasoning-why." "Seeing-that" is the pattern matching that brains have been doing for hundreds of millions of years. Even the simplest animals are wired to respond to certain patterns of input (such as light, or sugar) with specific behaviors (such as turning away from the light, or stopping and eating the sugary food). Animals easily learn new patterns and connect them up to their existing behaviors, which can be reconfigured into new patterns as well (as when an animal trainer teaches an elephant a new trick).

As brains get larger and more complex, animals begin to show more cognitive sophistication—making choices (such as where to forage today, or when to fly south) and judgments (such as whether a subordinate chimpanzee showed properly deferential behavior). But in all cases, the basic psychology is pattern matching. It's the sort of rapid, automatic, and effortless processing that drives our perceptions in the Muller-Lyer illusion. You can't choose whether or not to see the illusion; you're just "seeing-that" one line is longer than the other. Margolis also called this kind of thinking "intuitive."

"Reasoning-why," in contrast, is the process "by which we describe how we think we reached a judgment, or how we think another person could reach that judgment."[34] "Reasoning-why" can occur only for creatures that have language and a need to explain themselves to other creatures. "Reasoning-why" is not automatic; it's conscious, it sometimes *feels* like work, and it's easily disrupted by cognitive load. Kohlberg had convinced moral psychologists to study "reasoning-why" and to neglect "seeing-that."[35]

Margolis's ideas were a perfect fit with everything I had seen in my studies: rapid intuitive judgment ("That's just wrong!") followed by slow and sometimes tortuous justifications ("Well, their two methods of birth control might fail, and the kids they produce might be deformed"). The intuition launched the reasoning, but the intuition did not depend on the success or failure of the reasoning. My harmless-taboo stories were like Muller-Lyer illusions: they still felt wrong, even after you had measured the amount of harm involved and agreed that the stories were harmless.

Margolis's theory worked just as well for the easier dilemmas. In the Heinz scenario, most people intuitively "see that" Heinz should steal the drug (his wife's life is at stake), but in this case it's easy to find reasons. Kohlberg had constructed the dilemma to make good reasons available on both sides, so nobody gets dumbfounded.

The roach juice and soul-selling dilemmas instantly make people "see that" they want to refuse, but they don't feel much conversational pressure to offer reasons. Not wanting to drink roach-tainted juice isn't a moral judgment, it's a personal preference. Saying "Because I don't want to" is a perfectly acceptable justification for one's subjective preferences. Yet moral judgments are *not* subjective statements; they are claims that somebody did something wrong. I can't call for the community to punish you simply because I don't like what you're doing. I have to point to something outside of my own preferences, and that pointing is our moral reasoning. We do moral reasoning not to reconstruct the actual reasons why *we ourselves* came to a judgment; we reason to find the best possible reasons why *somebody else ought to join us* in our judgment.[36]

## THE RIDER AND THE ELEPHANT

It took me years to appreciate fully the implications of Margolis's ideas. Part of the problem was that my thinking was entrenched in a prevalent but useless dichotomy between cognition and emotion. After failing repeatedly to get cognition to act independently of emotion, I began to realize that the dichotomy made no sense. Cognition just refers to information processing, which includes higher cognition (such as conscious reasoning) as well as lower cognition (such as visual perception and memory retrieval).[37]

Emotion is a bit harder to define. Emotions were long thought to be dumb and visceral, but beginning in the 1980s, scientists increasingly recognized that emotions were filled with cognition. Emotions occur in steps, the first of which is to appraise something that just happened based on whether it advanced or hindered your goals.[38] These appraisals are a kind of information processing; they are cognitions. When an appraisal program detects particular input patterns, it launches a set of changes in your brain that prepare you to