

## Poly: ECE1 ESH: Cours 1: The Quiz Daniel Kahneman Wants You to Fail, Vanity Fair

In the December 2011 issue of *Vanity Fair*, Michael Lewis profiles Nobel Prize–winning psychologist Daniel Kahneman, who pioneered research into “heuristics,” or the shortcuts humans use when making decisions. Below, take our quiz to see how your own mind works.

By [Jaime Lalinde](#)

Plainly put, a “heuristic” is a tool we use to simplify the decision-making process. For example, if you’re driving in the United Kingdom for the first time and don’t know the traffic laws, heuristics might help you correctly assume that a green light means go and a red light means stop. By applying what you already know about driving in America, you won’t have to waste hours reading up on England’s traffic laws. However, that same heuristic could prove harmful if you start driving in the right-hand lane, against traffic. Research psychologist Daniel Kahneman—Nobel Prize winner, and the subject of Michael Lewis’s article in [this month’s issue](#), “[The King of Human Error](#)”—spent a great part of his life’s work discovering and cataloging the heuristics people use. Specifically, he concentrated on the situations where they lead us astray. By nature, heuristics are both useful and inaccurate; our minds have developed them to deal with a wide-ranging set of problems. In Kahneman’s forthcoming book, *Thinking, Fast and Slow*, he separates the thinking process into two types—System 1, in which efficiency comes at the cost of accuracy, and System 2, which requires a lot of focus and can sometimes prevent System 1 from making mistakes. When you’re asked what “2 + 2” equals, System 1 takes over, but when you’re asked what “17 x 24” equals, System 2 takes the reins. The questions in this quiz are designed to trigger System 1, which relies heavily on intuition to provide us with answers that we *perceive* to be correct. Whenever you find yourself “going with your gut,” that’s System 1—often standing in the way of rational thought. It’s no wonder that the word “heuristic” has its root in the word “eureka.” Go ahead and take this quiz, based (loosely) on Kahneman’s four decades of research; follow your gut and see just how wrong you are.

**1. A town has two hospitals: one large and one small. Assuming there is an equal number of boys and girls born every year in the United States, which hospital is more likely to have close to 50 percent girls and 50 percent boys born on any given day?**

- A. The larger
- B. The smaller
- C. About the same (say, within 5 percent of each other)

**2. A team of psychologists performed personality tests on 100 professionals, of which 30 were engineers and 70 were lawyers. Brief descriptions were written for each subject. The following is a sample of one of the resulting descriptions:**

Jack is a 45-year-old man. He is married and has four children. He is generally conservative, careful, and ambitious. He shows no interest in political and social issues and spends most of his free time on his many hobbies, which include home carpentry, sailing, and mathematics.

What is the probability that Jack is one of the 30 engineers?

- A. 10–40 percent
- B. 40–60 percent
- C. 60–80 percent
- D. 80–100 percent

**3a. How many dates did you have last month?**

- A. 1–3
- B. 3–5
- C. 0

3b. **On a scale of 1 to 5, how happy are you these days (5 being the happiest)?**

- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

4. **Imagine that you decided to see a play and you paid \$10 for the admission price of one ticket. As you enter the theater, you discover that you have lost the ticket. The theater keeps no record of ticket purchasers, so the ticket cannot be recovered. Would you pay \$10 for another ticket to the play?**

- A. Yes
- B. No

5a. **Choose between getting \$900 for sure or a 90 percent chance of getting \$1,000.**

- A. Getting \$900
- B. 90 percent chance of getting \$1,000

5b. **Choose between losing \$900 for sure or a 90 percent chance of losing \$1,000.**

- A. Losing \$900
  - B. 90 percent chance of losing \$1,000
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### **Explanatory notes**

- 1) The knee-jerk reaction is to select answer C; we expect things to follow a proven pattern regardless of size. But size matters. A small sample size (i.e., the small hospital) will often contain extreme proportions, while a large sample size (i.e., the large hospital) will more likely reflect real-world distributions. The heuristic shown here can be used to understand some forms of prejudice—if you haven't been exposed to a large number of people from a certain group, you're more likely to have incorrect assumptions about them. When you do not account for the size of a sample, Kahneman and his colleague Amos Tversky say, you have used the “representativeness heuristic.”
- 2) If you answered anything but A (the correct response being precisely 30 percent), you have fallen victim to the representativeness heuristic again, despite having just read about it. When Kahneman and Tversky performed this experiment, they found that a large percentage of participants overestimated the likelihood that Jack was an engineer, even though mathematically, there was only a 30-in-100 chance of that being true. This proclivity for attaching ourselves to rich details, especially ones that we believe are typical of a certain kind of person (i.e., all engineers must spend every weekend doing math puzzles), is yet another shortcoming of the hyper-efficient System 1.
- 3) Regardless of how you answered, it is likely that your answer to question (a) is positively correlated to your answer to question (b)—that is, you rated your happiness higher if you had more dates and lower if you had fewer dates. However, when the order of these questions was reversed, as was done by two German researchers, people's happiness became untethered from their dating life. This experiment demonstrates the brain's deferral to System 1, the faster and easier of the two processes. When faced with an objective question (in this case, How many dates did you have last month?), followed by a subjective

one (How happy are you these days?), people often simply carry over their answer for the first to the second. This heuristic is called substitution.

- 4) *If you answered no, as most people do, consider the following question: Imagine that you decide to see a play and you will pay \$10 for the admission price of one ticket at the door. As you enter the theater, you discover that you have lost a \$10 bill. Would you still pay \$10 for a ticket to the play?* If you answered yes to this analogous scenario (as both result in the net loss of \$10), it's likely you fell victim to what Kahneman and Tversky call the "framing effect": being swayed by the way in which questions are worded rather than responding just to their substance. When Kahneman and Tversky performed this experiment in 1981, they found that 46 percent of participants would pay for another ticket, while 88 percent of participants would purchase the ticket in the analogous example mentioned above. The framing effect is also used to explain the influence of positive and negative information on our decisions—for example, why consumers prefer to buy ground beef labeled 80 percent lean rather than 20 percent fat.
- 5) The results of this simple problem set, for which most participants answer A and then B, were used to develop the thesis that would make Kahneman and Tversky famous: prospect theory. In a 1979 paper, they documented a peculiar behavioral tendency: when people faced a gain, they became risk averse; when they faced a loss, they became risk seeking. As a result of their discovery, Kahneman and Tversky debunked Bernoulli's utility theory, a cornerstone of economic thought since the 18th century. (Bernoulli first proposed that a person's willingness to gamble a certain amount of money was a product of how that amount related to his overall wealth—that is, \$1 million means more to a millionaire than it does to a billionaire.)

Along with playing a large role in Kahneman's being awarded the Nobel Prize in 2002, the theory also spawned a new academic pursuit, the field of behavioral economics. Prospect theory, Michael Lewis writes, explains "why people are less likely to sell their houses and their stock portfolios in falling markets."