

Cognitive Misers

Extracted from: Keith E. Stanovich, "Rational and Irrational Thought: The Thinking That IQ Tests Miss", *Scientific American*, November/December 2009, pp 35-36

The human brain is a 'cognitive miser'—it can employ several approaches to solving a given problem, but almost always chooses the one that requires the least computational power:

"We tend to be cognitive misers. When approaching a problem we can choose from any of several cognitive mechanisms. Some mechanisms have great computational power letting us solve many problems with great accuracy, but they are slow require much concentration and can interfere with other cognitive tasks. Others are comparatively low in computational power, but they are fast require little concentration and do not interfere with other ongoing cognition. Humans are cognitive misers because our basic tendency is to default to the processing mechanisms that require less computational effort even if they are less accurate. Are you a cognitive miser? Consider the following problem taken from the work of Hector Levesque a computer scientist at the University of Toronto. Try to answer it yourself before reading the solution.

Problem: Jack is looking at Anne but Anne is looking at George. Jack is married but George is not. Is a married person looking at an unmarried person?

A) Yes

B) No

C) Cannot be determined

"More than 80 percent of people choose C. But the correct answer is A. Here is how to think it through logically: Anne is the only person whose marital status is unknown. You need to consider both possibilities either married or unmarried to determine whether you have enough information to draw a conclusion. If Anne is married the answer is A: she would be the married person who is looking at an unmarried person (George). If Anne is not married the answer is still A: in this case Jack is the married person and he is looking at Anne the unmarried person. This thought process is called fully disjunctive reasoning—reasoning that considers all possibilities. The fact that the problem does not reveal whether Anne is or is not married suggests to people that they do not have enough information and they make the easiest inference (C) without thinking through all the possibilities. Most people can carry out fully disjunctive reasoning when they are explicitly told that it is necessary (as when there is no option like 'cannot be determined' available). But most do not automatically do so and the tendency to do so is only weakly correlated with intelligence.

"Here is another test of cognitive miserliness as described by Nobel Prize-winning psychologist Daniel Kahneman and his colleague Shane Frederick.

A bat and a ball cost \$1.10 in total. The bat costs \$1.00 more than the ball. How much does the ball cost?

"Many people give the first response that comes to mind—10 cents. But if they thought a little harder they would realize that this cannot be right: the bat would then have to cost \$1.10 for a total of \$1.20. IQ is no guarantee against this error. Kahneman and Frederick found that large numbers of highly select university students at the Massachusetts Institute of Technology Princeton and Harvard were cognitive misers just like the rest of us when given this and similar problems."

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