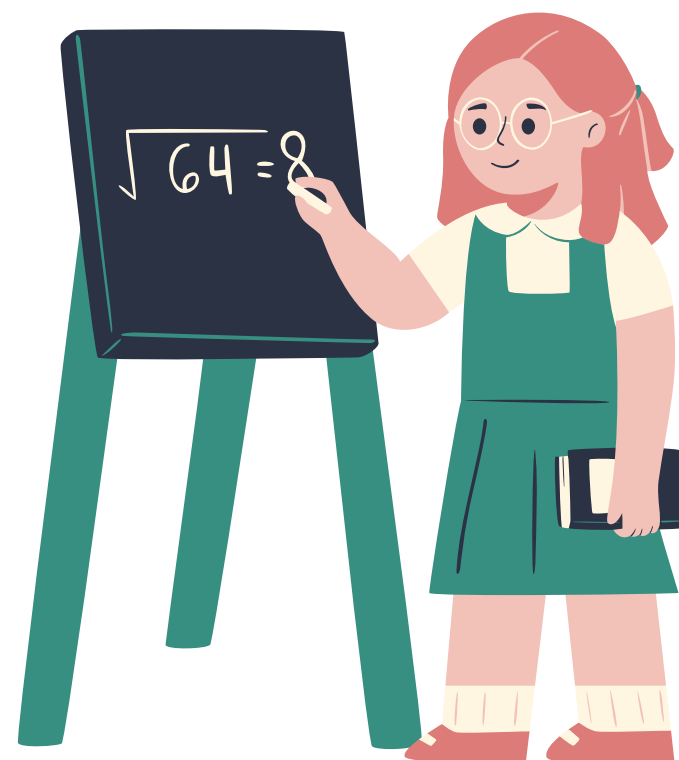


# So You Think You're Logical?

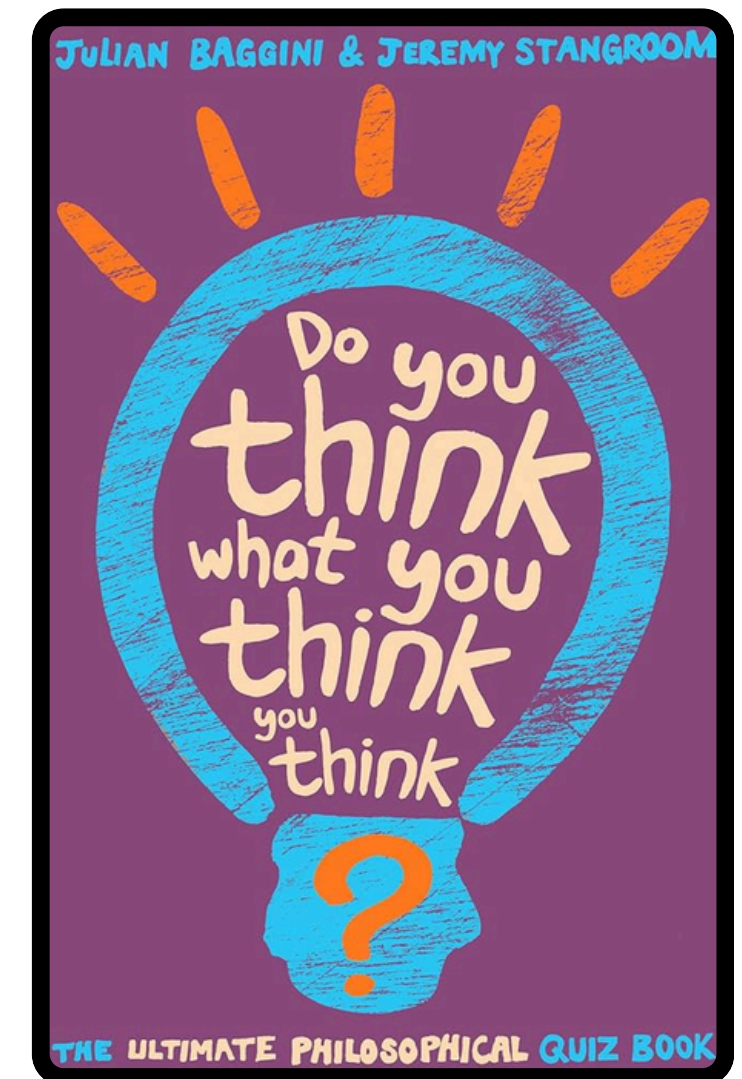


Gui Araujo



# Introduction

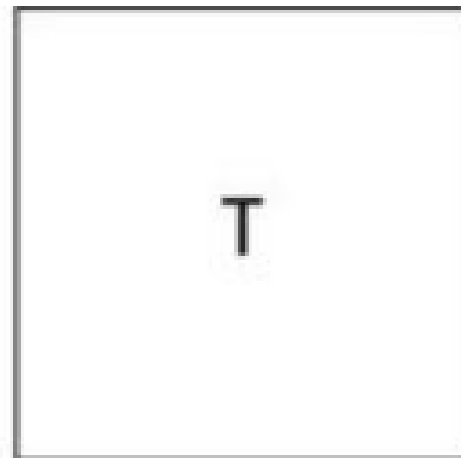
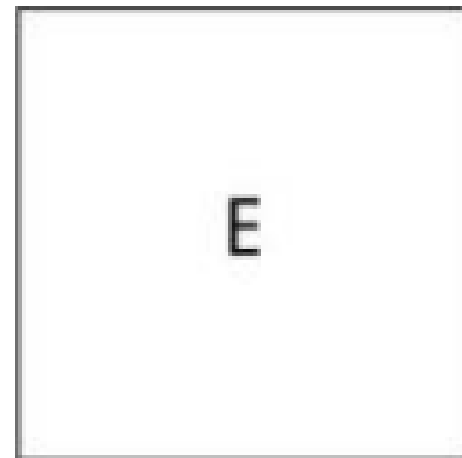
- The following is a variant of the Wason selection tasks, developed by the psychologist Peter C. Wason in 1966.
- It is one of the most famous tests in the study of deductive reasoning.
- This variant was copied from the philosophical quiz book by philosophers Julian Baggini and Jeremy Stangroom: *Do you think what you think you think?*
- Please, don't feel any pressure. This is not about your skills. It's about the human reason.



## Task 1: Even Vowels

You are employed in quality control by a card manufacturer. They are producing cards for an experimental psychologist, according to the rule: **if a card has a vowel on one side, then it has an even number on the other side.**

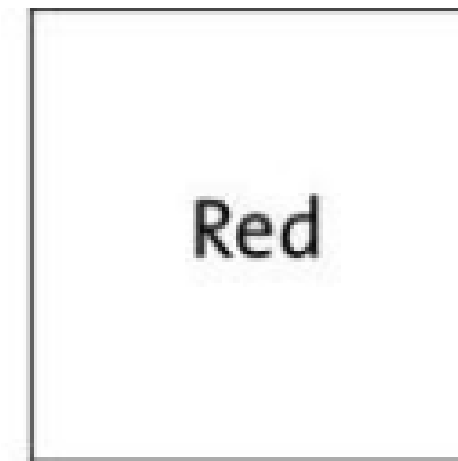
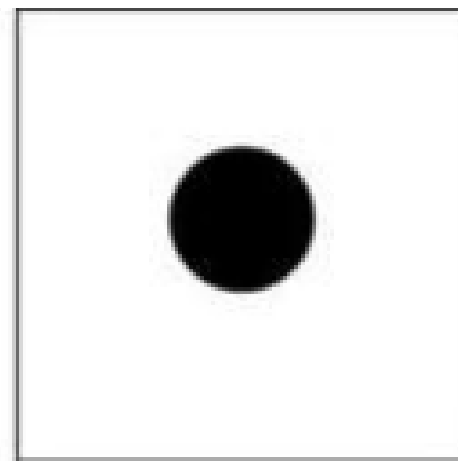
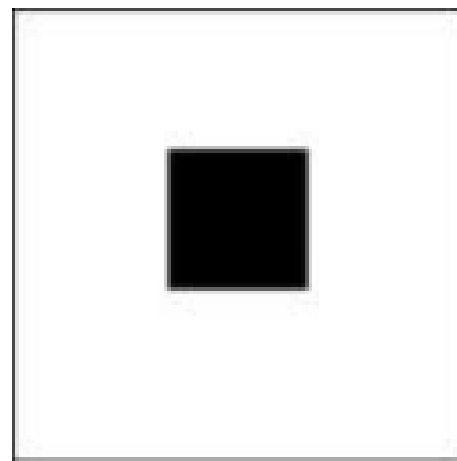
There are 4 of these cards below. You know for certain that each card has a letter on one side and a number on the other. Then, select the card(s) you definitely need to turn over, and only that(those) cards, in order to determine whether the rule is broken in the case of any of these 4 cards.



## Task 2: Coloured Circles and Squares

You have been employed by a boardgame manufacturer to ensure that the cards in one of their games have been correctly produced. The rule governing the production of the cards is: **if a card has a circle on one side, then it has the colour yellow on the other.**

There are 4 such cards below. You know for certain that each card has a shape on one side and a colour on the other. Then, select the card(s) you definitely need to turn over, and only that(those) cards, in order to determine whether the rule is broken in the case of any of these 4 cards.



## Task 3: Sly Beer Drinking

You are the owner of a bar and you are concerned that underage drinking laws should be correctly enforced. Your bar is situated in a university town, and you suspect that some of your clientele might be students not yet old enough to drink legally. The law states that: **if a person drinks an alcoholic drink (e.g., beer), then they must be more than 21 years old.**

The cards below have information about the ages and drinking habits of 4 of the customers at your bar. Each card represents one person. One side of a card details the age of the person. The other side of the card indicates what they have been drinking. Then, select the card(s) you definitely need to turn over, and only that(those) cards, in order to determine whether the rule is broken in the case of any of these 4 drinkers.

Drank  
beer

Drank  
cola

23 years  
old

19 years  
old

## Task 4: Surfing at Work

You are the owner of a small company employing ~20 people. You have noticed that your employees seem to be spending a lot of time during work hours surfing the web for personal pleasure. You have introduced a rule: **if an employee spends more than 2 hours a day during work time on the web, then they must have made at least £5K for the company in the last month.**

The cards below have information about the web-surfing habits of 4 of your employees. One side of the card details how much time the employee has spent on the web during the last working day. The other side details how much money they have made for the company in the last month. Then, select the card(s) which you definitely need to turn over, and only that(those) cards, in order to determine whether the rule is broken.

Spent 1  
hour on  
the web

Spent 3  
hours on  
the web

Made  
£3K last  
month

Made  
£7K last  
month

# Answers

- **Task 1:** E and 7
- **Task 2:** Circle and Red
- **Task 3:** Beer and 19yo
- **Task 4:** 3h and £3k

# General Question

All tasks are different on the surface, but their abstract logic is always the same.  
Logical rule: **if P, then Q**.

- Cards:



- Answers: **P** and  $\neg Q$ .



# Discussion

- Tests applied on the internet show that 16% of participants answer correctly on task 1, 12% on task 2, 76% on task 3, and 68% on task 4.
- Tasks 1,2 are abstract mental tasks while 3,4 are life scenarios involving the detection of cheating/incorrect behavior.
- This result gives insight into a question on evolutionary psychology: how did logical/deductive reasoning evolve?
- What does this teach us about formal logical learning?

# Discussion

- “The human cognitive architecture is densely populated with a large number of evolved, content-specific, domain-specific inference engines (or evolved mechanisms for their developmental acquisition), in addition to whatever more domain- or content-general inferential competences may exist.”
- “When experiments are designed so that logically mediated relevance effects are placed into conflict with social contract or hazard management effects, the outputs of these content-specialized systems are predicted to override logically driven relevance effects (if they exist).”

