Argumentation and human reason

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What is reason?
Intuition

It’s going to rain

It needs food and water

Peter is 8, John is 12

John is older than Peter
- S=1+2+...+99+100 is equivalent to S=(100*101)/2 because...

- My coat is neither on the coat hanger nor in my dressing, so I must have forgotten it at work

- You shouldn’t have any coffee, it will keep you awake
Why do we reason?
The individualistic view of reasoning
Peter is looking at Linda
Linda is looking at Henry

Peter is married
Henry is not married

Is someone who is married looking at someone who is not married?

Yes    No    We can’t tell
An intuitive mistake

Peter is looking at Linda
Linda is looking at Henry

Peter is married
Henry is not married

Is someone who is married looking at someone who is not married?

Yes  No  We can’t tell
Peter is looking at Linda
Linda is looking at Henry

Peter is married
Henry is not married

Is someone who is married looking at someone who is not married?

Yes  No  We can’t tell
Reasoning can help the lone reasoner correct mistaken intuitions and arrive at better beliefs.
Reasoning *can* help the lone reasoner correct mistaken intuitions and arrive at better beliefs.
The Levesque task

Peter is looking at Linda
Linda is looking at Henry

Peter is married
Henry is not married

Is someone who is married looking at someone who is not married?

Yes  No  We can’t tell

Trouche, Sander, & Mercier 2014
Reasoning can help the lone reasoner correct mistaken intuitions and arrive at better beliefs

*But it often doesn’t*
Peter is looking at Linda
Linda is looking at Henry
Peter is married
Henry is not married
Is someone who is married looking at someone who is not married?

Yes
No
We can’t tell

The answer depends on Linda’s status
We don’t have enough information
We don’t know if Linda is married
Reasoning can help the lone reasoner correct mistaken intuitions and arrive at better beliefs.

But it often doesn’t.

*Because it does precisely the opposite*
The individualist view of reasoning

WHAT THEN?
The interactionist view of reason

Why do humans reason? Arguments for an argumentative theory

Abstract: Reasoning is generally seen as a means to improve knowledge and make better decisions. However, much evidence shows that reasoning often leads to irrationality and poor decisions. This suggests that the function of reasoning should be rethought. Our hypothesis is that the function of reasoning in argumentation is to defend and promote one’s own views. Thus, the nature of reasoning is not to make decisions but rather to persuade others. A wide range of evidence in the psychology of reasoning and decision making can be reconstructed and better explained in the light of this hypothesis. This performance-based reasoning task is explained by the lack of argumentative content. Where the same problems are placed in a proper argumentative setting, people turn out to be skilled arguers. Skilled arguers, however, are not after the truth but after agreement supporting their view. This explains the notorious confirmation bias. This bias is apparent not only when people are actually arguing but also when they are reasoning proactively from the perspective of having to defend their opinions. Reasoning as advocated can distort evaluations and attitudes and alter common beliefs to persist. Practically useful reasoning, like future decisions that are easy to justify but not necessarily better, is in all these instances traditionally described as failures or flaws, reasoning does exactly what can be expected of an argumentative device. Look for arguments that support a given conclusion, and, in the end, favor conclusions for which arguments can be found.

Keywords: reasoning, confirmation bias, decision making, dual process theory, evolutionary psychology, motivated reasoning, reason-based choice, reasoning

Hugo Mercier and Dan Sperber

Introduction: the theory of re-capitulation (or the argumentative turn)

The theory of re-capitulation (or the argumentative turn) can be considered the last stage in a continuous process of evolution in the domain of reasoning and argumentation. The first stage was the emergence of language, which provided a new means of communication and interaction. The second stage was the development of logical reasoning, which allowed individuals to analyze and evaluate arguments. The third stage was the development of argumentative reasoning, which allowed individuals to engage in a more proactive and strategic use of reasoning to defend and promote their own views. This stage is characterized by the development of skills in argumentation, such as the ability to construct and evaluate arguments, to anticipate and counter arguments made by others, and to adapt one’s own arguments in response to feedback.

Hugo Mercier is a professor of philosophy at the University of Pennsylvania. His work has focused on the theme of the present article – reasoning and argumentation. He is working on a series of articles that cover the main themes from different perspectives – developmental, computational, philosophical, and methodological.

Dan Sperber is a French social and cognitive scientist. He is professor of philosophy and cognitive science at the Central European University, Budapest, and director of the research centre on the Human Mind Project (CIRIEC, ENS, and EHESS, Paris). He is the editor of “Explaining Symbolism” (2017), an Anthological Collection (2017) and Explaining Symbolism (2001), the co-editor with David Premack and Alan Green of Hominin Cognition & Multilevel Theory (2001) and, with Éva Eros, of Representational Pragmatics (2014).
Prediction 1

Myside bias
Selective laziness
Sylvia: “We should go to Isami, it’s a good restaurant”
Helen: “I don’t know, I’ve had Japanese last week already”
Sylvia: “But this one is very original”
Sylvia: “We should go to Isami, it’s a good restaurant”
Helen: “I don’t know, I don’t have much money at the moment, and Japanese restaurants can be pricy”
Sylvia: “But this one is quite cheap”
Sylvia: “We should go to Isami, it’s original, the prices are good, the fish is fresh, the crowd is lively... ”
Sylvia, thinking: I wonder if Helen has been to a Japanese restaurant lately. And would she be bothered by high prices? Does she eat raw fish? Does she enjoy the kind of crowd you get in typical Japanese restaurants? Would she believe it’s in an inconvenient location?...
People should typically start with a reasonable argument, even if it is a relatively weak, generic argument.
Prediction in evaluation

People should carefully examine other people’s arguments
First phase: NO REASONING
In a fruit and vegetable shop which carries, among other products, apples:
None of the apples are organic.
What can you conclude for sure about whether fruits are organic in this shop?

- All the fruits are organic
- None of the fruits are organic
- Some fruits are organic
- Some fruits are not organic
- We cannot tell anything for sure about whether fruits are organic in this shop

"Because none of the apples are organic, and an apple is one type of fruit, we can say that some of the fruits in the store are not organic."
In a fruit and vegetable shop which carries, among other products, apples:

None of the apples are organic.

What can you conclude for sure about whether fruits are organic in this shop?

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- **Some fruits are not organic**
- We cannot tell anything for sure about whether fruits are organic in this shop
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Second phase: ARGUMENT PRODUCTION
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“Because none of the apples are organic, and an apple is one type of fruit, we can say that some of the fruits in the store are not organic.”
86% stick to their intuitive answer
Not more likely to stick to their intuitive answer if it is valid than if it is invalid
Third phase: ARGUMENT EVALUATION
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You answered
Some fruits are not organic
In a fruit and vegetable shop which carries, among other products, apples:
None of the apples are organic.
What can you conclude for sure about whether fruits are organic in this shop?
   All the fruits are organic
   None of the fruits are organic
   Some fruits are organic
   Some fruits are not organic
   We cannot tell anything for sure about whether fruits are organic in this shop

You answered
   Some fruits are not organic
Someone else answered
   We cannot tell anything for sure about whether fruits are organic in this shop
And the argument was:
   “There is not enough information to conclude about all the fruits in this shop.”
In a fruit and vegetable shop which carries, among other products, apples:
None of the apples are organic.
What can you conclude for sure about whether fruits are organic in this shop?
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You answered
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Someone else answered
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And the argument was:
   “There is not enough information to conclude about all the fruits in this shop.”

If you want you can change your mind
In a fruit and vegetable shop which carries, among other products, apples: None of the apples are organic. What can you conclude for sure about whether fruits are organic in this shop?

   All the fruits are organic
   None of the fruits are organic
   Some fruits are organic
   Some fruits are not organic

   We cannot tell anything for sure about whether fruits are organic in this shop.

And the argument was:

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You answered:
We cannot tell anything for sure about whether fruits are organic in this shop.

Someone else answered:
Some fruits are not organic.

And the argument was:
“Because none of the apples are organic, and an apple is a type of fruit, we can say that some of the fruits in the store are not organic.”

If you want you can change your mind.
54% do not detect the inversion
58% reject their own argument
43% reject their own ‘good’ argument

69% reject their own ‘bad’ argument
Good argument evaluation skills
People discriminate between fallacious and non-fallacious arguments (at least when they disagree with the conclusion)
People can accept strong enough arguments, even if the arguments challenge their beliefs.

Prior confidence and trust in source do not affect the evaluation of conclusive arguments.

Trouche, Shao, & Mercier in press
Try to convince someone

Levesque, etc.

Yes because...

Yes because...

We don’t know because...

We don’t know because...

Trouche, Shao, & Mercier in press
To elicit *low confidence*:

We ask that YOU ANSWER QUICKLY.

To elicit *high confidence*:

We ask that YOU THINK VERY CAREFULLY ABOUT YOUR ANSWER, and that you JUSTIFY IT WELL.
Confidence in wrong answer

- Low confidence
- High confidence
% accepting the correct answer

low confidence  high confidence
Groups outperform individuals on reasoning tasks
Individual vs. group

Trouche, Sander, & Mercier 2014
Individual vs. group

Trouche, Sander, & Mercier 2014; Mercier & al 2015; Castelain, Girotto, Jamet, & Mercier 2016
Individual vs. group

Individual vs. group

Trouche, Sander, & Mercier 2014; Park & Lee 2015
Argumentation’s efficacy is not intuitive

![Bar chart showing the ratio of group to individual performance for typical sample, psychologists of reasoning, and reality.]

Mercier et al. 2015
Individual reason is overrated

Argumentation is underrated

Reason is for interacting: exchanging arguments and justifications
Thank you!