

Cognitive Biases - Barriers to Reasoning

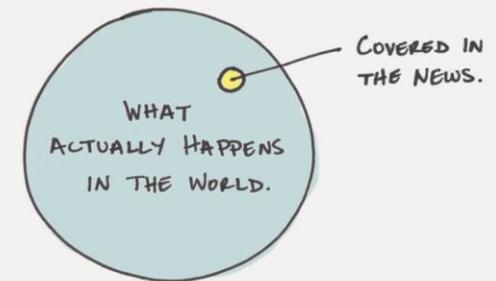
- 1- Availability Heuristic

Exaggerating the Improbable

- Estimating the likelihood of events based on their availability in memory. We assume such events are common.
- Vivid cases in the news often cause an availability heuristic.
- "If it happened in the past, then it will happen again/now."



THE AVAILABILITY HEURISTIC



Example:

- After reading an article about lottery winners, you start to overestimate your own likelihood of winning the jackpot.



Availability Heuristic

Does this look good?



Well, at least moderately acceptable?

Wait, what???

?



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This is an example of....



Cognitive Biases - Barriers to Reasoning

- 2- Representativeness Heuristic

Who went to Harvard?



My friend Dan is a smart dude, but did not go to Harvard (but he looks like he did).



- Judging a situation based on how similar the aspects are to the prototypes the person holds in her mind.
- Like thinking everyone from Decatur is preppy, or someone with glasses is nerdy, or a blonde is not smart.

• If I tell you that Sonia Dara was a Sports Illustrated swimsuit model, you would most likely make certain quick judgments (heuristics) about her...such as her interests or intelligence.

• Sonia was a Sports Illustrated swimsuit model AND she graduated with an economics / human evolutionary biology degree with honors from Harvard University

Representativeness Heuristic

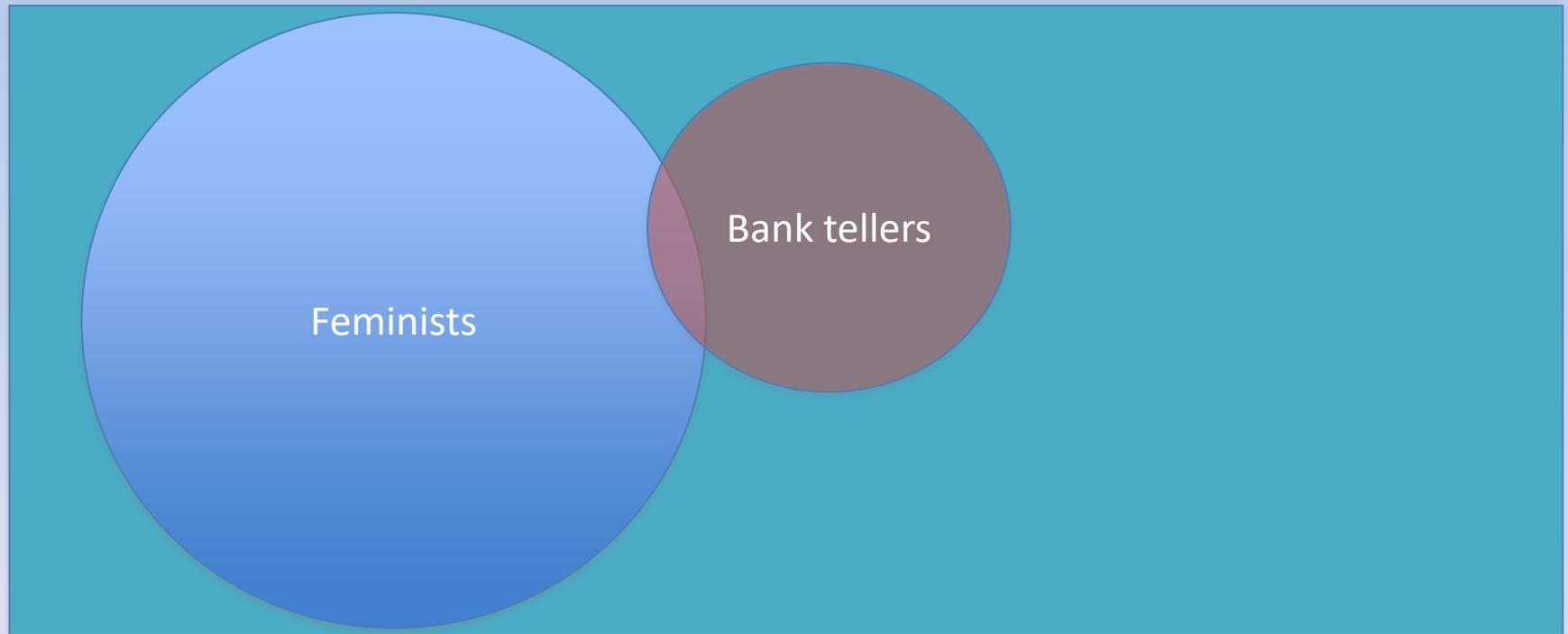
Linda is 31, single, outspoken and very bright. She majored in philosophy in college. As a student, she was deeply concerned with discrimination and other social issues, and she participated in antinuclear demonstrations.

Which statement is more likely?

- a. Linda is a bank teller
- b. Linda is a bank teller and a feminist activist.

Representativeness fallacy

- Judging the conjunction of two events to be more probable than one of the individual elements.



The Availability and Representativeness Heuristics

Table 3.1: The Availability and Representativeness Heuristics

Heuristic	Definition	Example	Downside
Availability	a rule used to estimate the likelihood of a given occurrence based on how easily one can recall an example of that occurrence	Fearing air travel more after the events of Sept. 11	Giving more weight to the scarier, more vivid occurrences without fearing other, more likely instances
Representativeness	a rule used to estimate the likelihood of an event based on how well it fits with your expectations of a model for that event	Thinking that Jen is a librarian because she wears glasses and is considered to be an introvert	Ignoring other important information

Source: Based on Gigerenzer, G. (2004b). Fast and frugal heuristics: The tools of bounded rationality. In D. Koehler & N. Harvey (Eds.), *Blackwell handbook of judgment and decision making* (pp. 62–88). Oxford, UK: Blackwell.

3. Anchoring & Adjustment Heuristic

- A mental shortcut whereby people use a number or value as a starting point and then adjust insufficiently from this anchor.

The image shows the Kohl's logo, which consists of the word "KOHLS" in a bold, white, sans-serif font. The letters are set against a dark red rectangular background. The logo is positioned in the center of the slide, partially overlapping a collage of torn paper elements. Above the logo, a small red sun-like icon is visible. Below the logo, a yellow banner with a scalloped edge contains the word "GUTCHA!" in red, bold, uppercase letters. The entire scene is set against a light blue background with white paper scraps scattered around the central elements.

Now you hear that the coat is only \$250, and because of the anchoring and adjustment heuristic you convince yourself that you got a great deal!!!

Cognitive Biases - Barriers to Reasoning

- 4- Confirmation Bias
- The tendency to selectively search for and consider information that confirms one's beliefs.

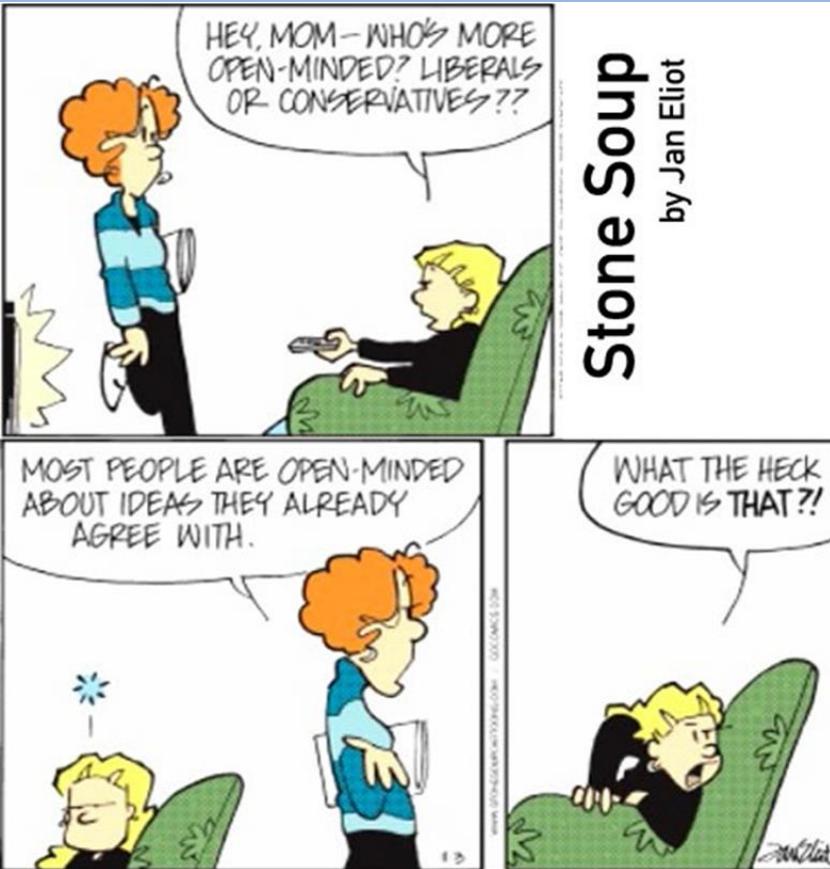
- **Examples:**



&



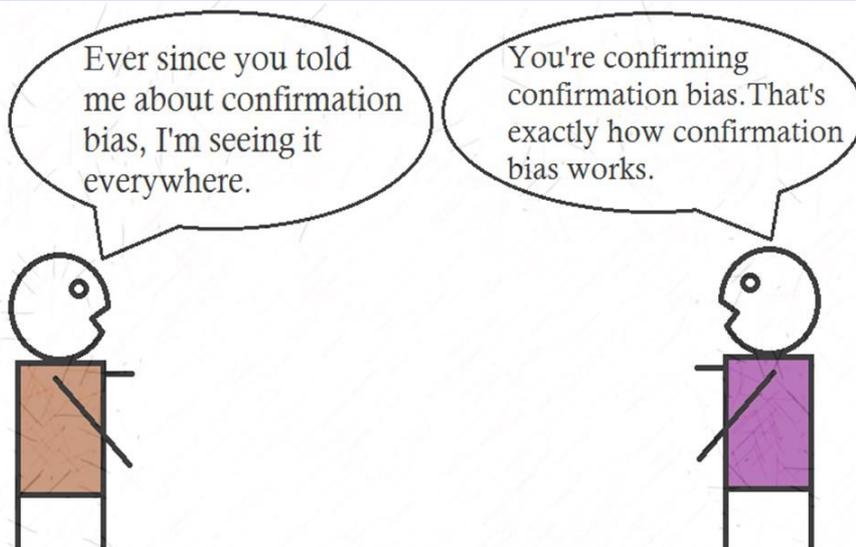
- A reporter who is writing an article on an important issue may only interview experts that support her or his views on the issue.
- One who believes in astrology will believe when the horoscope is "right" and ignore when it is "wrong."



An approach more likely to occur than what is illustrated in the cartoon above could be:

"Here's my conclusion. What facts can I find to support it?"

- Mr. Confirmation bias



Cognitive Biases - Barriers to Reasoning

- **5- Framing and the Tendency to Avoid Loss**

How an issue is framed can significantly affect decisions and judgments.

- **Examples:**

- If you take chemotherapy, you'll lose your hair. (People will respond cautiously - negative drawback highlighted.)

- If you take the medication for high blood pressure, you'll be OK. (People will go for it - positive outcome highlighted.)

Cognitive Biases - Barriers to Reasoning

Our beliefs are, once established, are likely to continue.

- 6 - Belief Bias (when an individual's own values, beliefs, prior knowledge, etc. affects, or distorts, the reasoning process.)
- 7 - Belief Perseverance (Sticking with your own beliefs when presented with conflicting evidence.)

In part, belief perseverance is maintained because of confirmation bias and belief bias.

Examples:

- Bias: Research studying the effect of prayer on illness.
 - A scientific researcher will use data to come to a conclusion.
 - A highly religious person may interpret the data in favor of prayer as a factor in healing.
 - An atheist may discount pro-prayer data.
- Perseverance: Someone who thinks they are a good driver gets a ticket and doesn't accept the fact that they may be an unsafe driver. They make excuses instead and continue to think that they drive safely.

All Cowboy fans who still believe that this is going to be their year are suffering from belief perseverance.



Belief Perseverance



Seriously, there are people who refuse to believe the moon landing happened, that Elvis is dead, or that the holocaust occurred.

These people continue to hold on to their belief, even with mountains of evidence to the contrary. Their "belief perseveres."

Cognitive Biases - Barriers to Reasoning

- 8- Mental set
- An inability to see a problem from a fresh perspective.
- When a person approaches a problem one particular way, usually a way that has been successful in the past. (rigidity.)

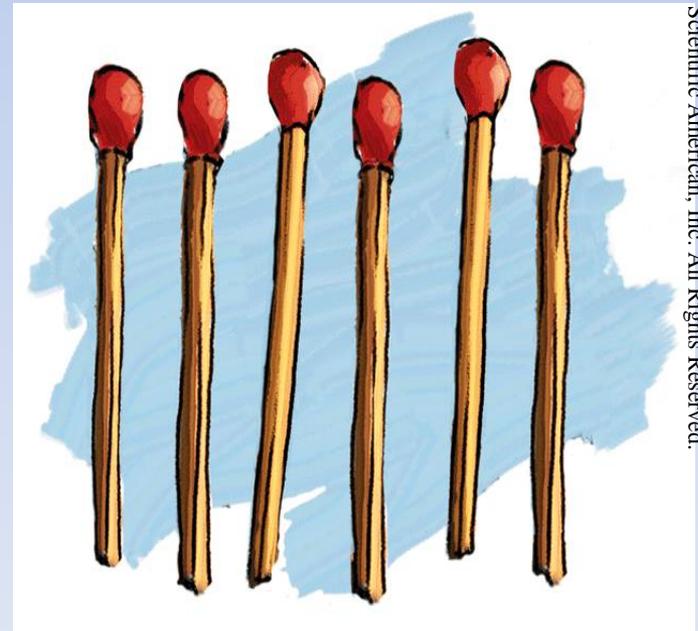


Cognitive Biases - Barriers to Reasoning

- 8- Mental set
- An inability to see a problem from a fresh perspective. (Getting "stuck")
- When a person approaches a problem one particular way, usually a way that has been successful in the past. (rigidity.)

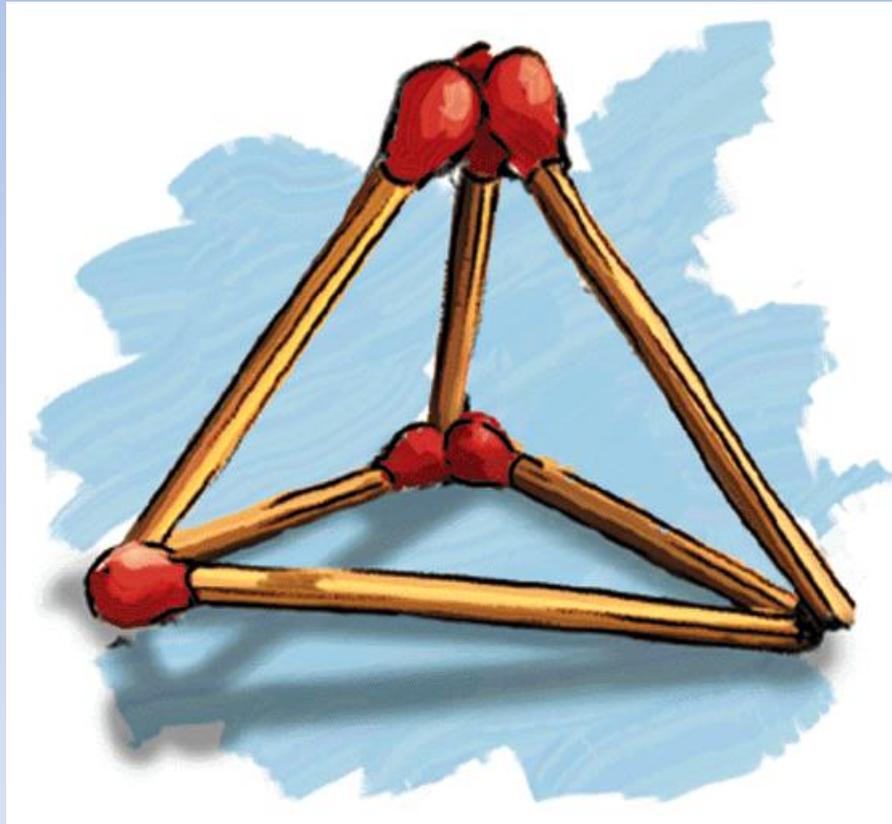
The Matchstick

Problem: How would you arrange six matches to form four equilateral triangles?



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The Matchstick Problem: Solution



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The Mind Can Refuse to Make Connections

Because it gets "stuck"...

Q. How do you put a bear in a refrigerator?

A. Open the door, put the bear in, close the door.

Q. How do you put a lion in the refrigerator?

A. Open the door, take out the bear, put the lion in.

Q. Noah is hosting an animal conference. All animals but one attend. Which one?

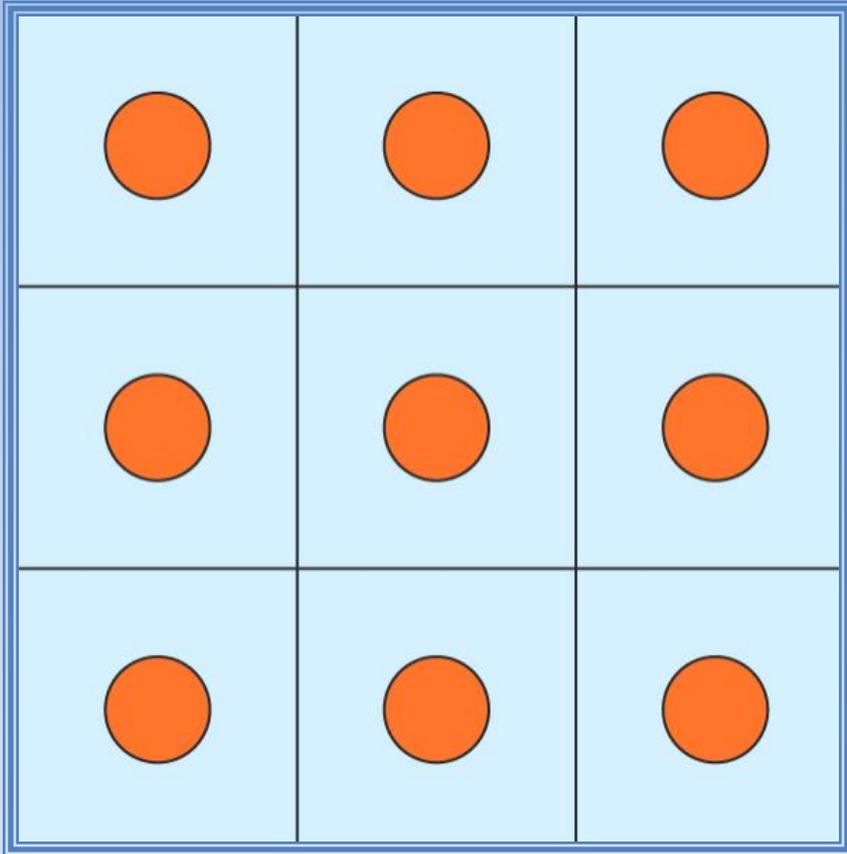
A. The lion who is freezing his butt off in the refrigerator

Q. You want to cross a river that is inhabited by crocodiles. How do you do it?

A. Swim across - the crocs are at the conference.



Mental Set



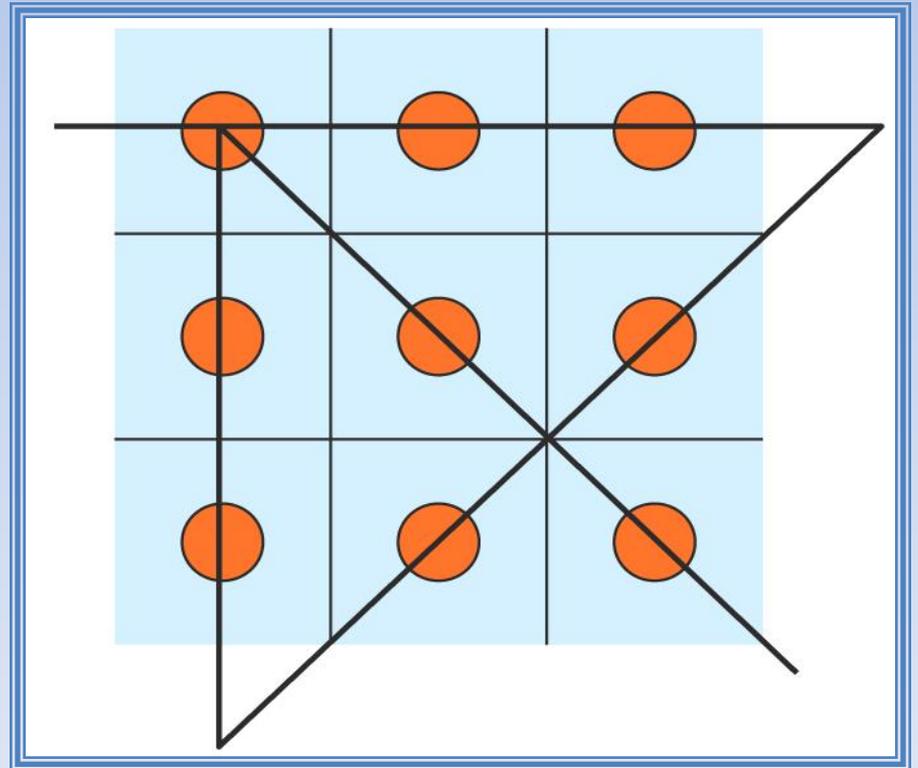
Using no more than four lines, can you connect all nine dots without lifting your pencil from the paper?

You can NOT re-trace, nor can you "bend" or "curve" the lines.

(Mental Sets Continued)

Tendency to fall into established thought patterns. Most people will use solutions or past experience to try to solve new problems (they think "what worked in the past is bound to work now").

- To overcome **mental sets** you must "think outside the box"—literally!



Barriers to Reasoning

- 9-Functional Fixedness
- Thinking of an object as only functioning in its usual way.
- As a result, individuals often do not see unusual or innovative uses for familiar objects
- **Examples:**
- Ransacking the house for a screw driver when a dime would have turned the screw.

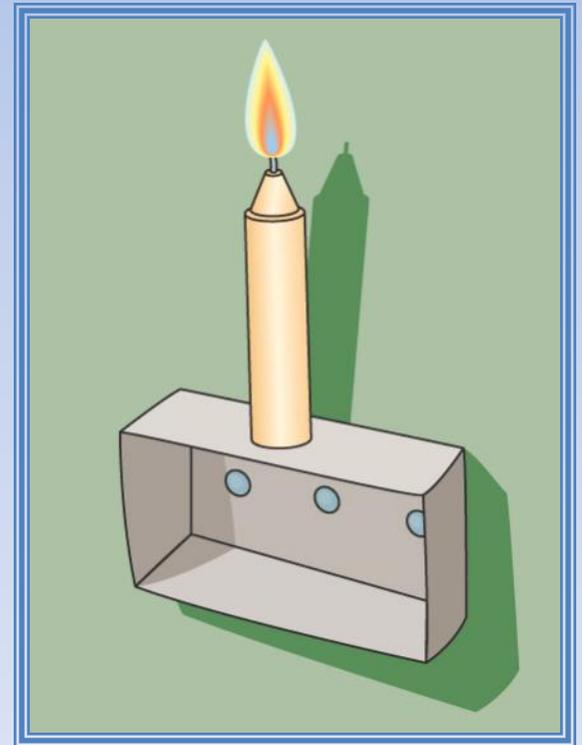


Can you use these supplies to mount the candle on the wall so that it can be lit in a normal way without toppling over?

Thinking—Five Key Barriers to Problem Solving

(Functional Fixedness Continued)

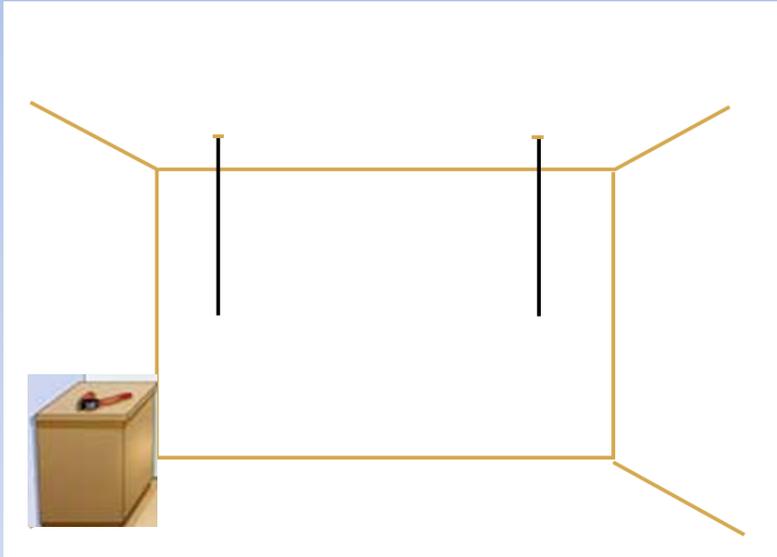
- To overcome functional fixedness, you must think of the matchbox, tacks, and candle all functioning in new ways.



(Functional Fixedness Continued)

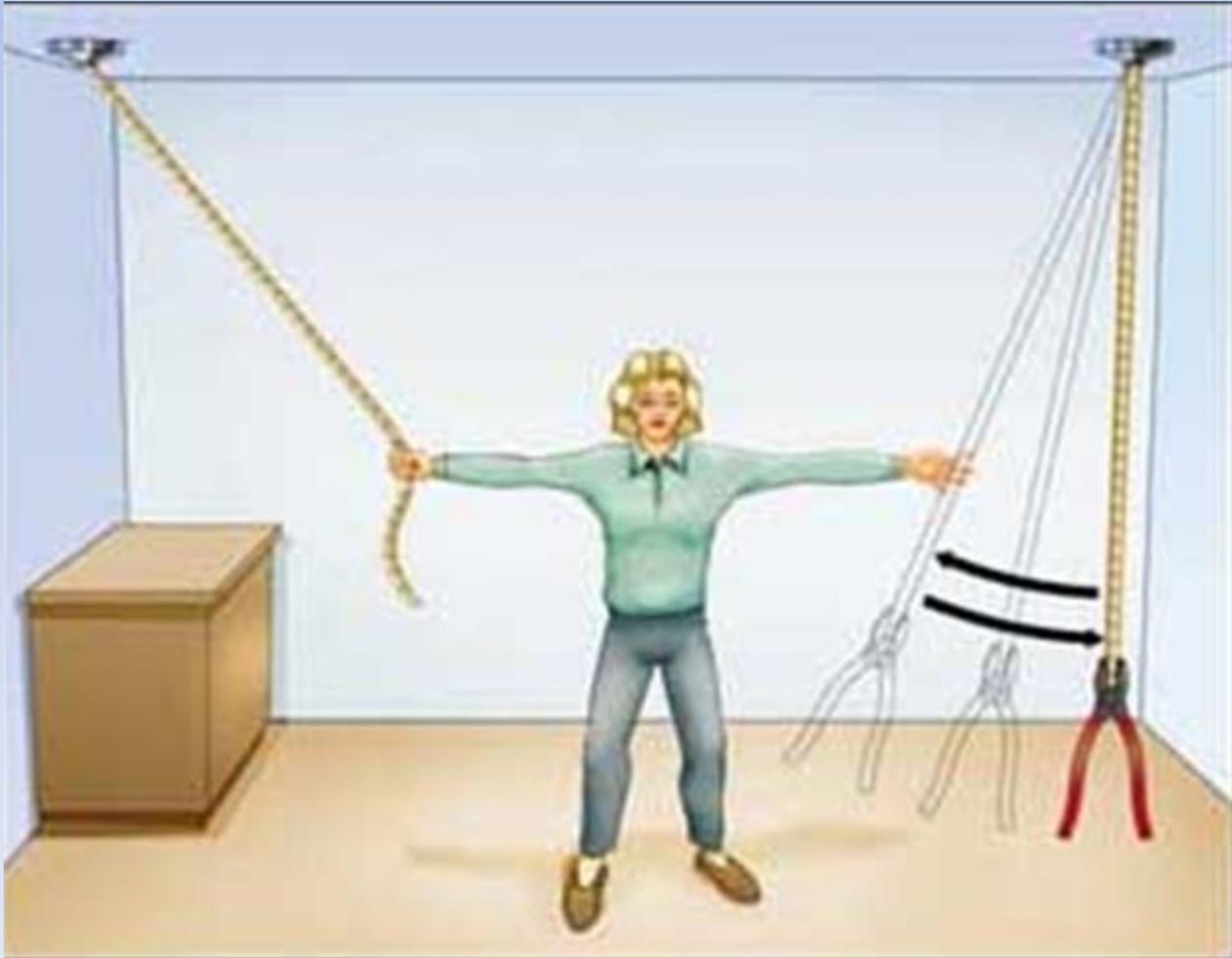
Maier (don't need to know that name,) asked participants to tie the two strings together.

(There were a number of objects available in the room.)



(Functional Fixedness Continued)

- Maier found it was possible to facilitate insight by 'accidentally' brushing against the string.
- Those who solved it rarely reported noticing this cue.
- Unconscious cues can lead to problem restructuring and then to insight.



This person has overcome
functional fixedness



Cognitive Biases - Barriers to Reasoning

- 10 - Overconfidence
- The tendency to overestimate the accuracy of our beliefs and judgments. (one's ability to predict the future.)
- **Examples:**

At a stock market, both the seller and the buyer may be confident about their decisions on a stock.



Do you like this stuff? There are a lot more forms of bias out there to study if you go into cognitive psychology!!!

It is great for your relationships!!!

