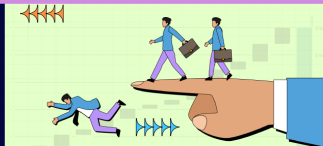


[illegible]

Misinformation

Misleading
Statistics
in the Media:
Examples
and How to
Spot Them



HOW STATISTICS
CAN BE MISLEADING

TED Ed



HOW FALSE NEWS
SPREADS

TED Ed



Misinformation



Comment traduire le verbe “permettre”?

Complétez les phrases suivantes en proposant une traduction adaptée en contexte de l'expression “permettre”.

1. The law do everything you want.
2. I was sixteen when my parents go on holiday on my own.
3. My grandparents' money me to go to the US.
4. The 2010 law curb tax evasion.
5. They buy a new car.

Misinformation



Comment traduire le verbe “permettre”?

Complétez les phrases suivantes en proposant une traduction adaptée en contexte de l'expression “permettre”.

1. The law **does not permit you to** do everything you want. (*permission officielle, délivrée par une administration*)
2. I was sixteen when my parents **allowed me to** go / **let me** go on holiday on my own. (*donner une permission*)
3. My grandparents' money **enabled** me / **made it possible for** me to go to the US. (*donner les moyens à quelqu'un de*)
4. The 2010 law **has made it possible to** curb tax evasion.

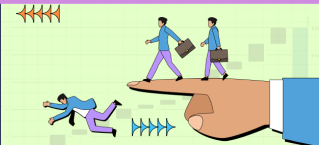
The 2010 law **has enabled the government to** curb tax evasion.

Contrairement au français “permettre”, les verbes “allow” et “enable” ne peuvent pas être suivis directement d'un infinitif. Il faut donc soit introduire un sujet pour le verbe traduisant “réduire”, soit opter pour une autre traduction.

5. They **can't afford to** buy a new car. (*se permettre*)

Misinformation

Misleading
Statistics
in the Media:
Examples
and How to
Spot Them



Comment traduire “faire faire”?

Traduisez les phrases en tenant compte de la situation particulière décrite par l'expression “faire faire”.

1. J'ai fait vérifier la chaudière par le plombier.

.....

2. Le patron l'a obligée à démissionner.

.....

3. J'ai fait arroser les plantes par notre voisin pendant notre absence.

.....

4. Faites-les entrer.

.....

5. Quand s'est-il fait couper les cheveux pour la dernière fois?

.....

Misinformation



Comment traduire “faire faire”?

Traduisez les phrases en tenant compte de la situation particulière décrite par l'expression “faire faire”.

1. J'ai fait vérifier la chaudière par le plombier.

I've had the boiler checked by the plumber.

I've had the plumber check the boiler.

Il s'agit d'un service, d'une prestation que l'on demande à quelqu'un que dans la plupart des cas, on rémunère en contrepartie. Dans la première de ces constructions, on emploie le participe passé (“checked”) parce que “boiler” est l'objet du verbe, tandis que l'on emploie l'infinitif dans la seconde (“check”) parce que “plumber” est le sujet de ce verbe.

2. Le patron l'a obligée à démissionner.

The boss made her resign.

Il s'agit d'obliger quelqu'un à faire quelque chose (ou de susciter une réaction involontaire, par exemple “She makes me laugh”).

Misinformation



3. J'ai fait arroser les plantes par notre voisin pendant notre absence.

While we were away, I **got** our neighbour **to** water the plants.

"Get somebody to do something" signifie "obtenir de quelqu'un qu'il fasse quelque chose" par la persuasion ou la ruse par exemple.

4. Faites-les entrer.

Show them in.

5. Quand s'est-il fait couper les cheveux pour la dernière fois?

When did he last **have** his hair **cut**?

6. Si on fait manger les enfants maintenant, on pourra sortir plus tôt.

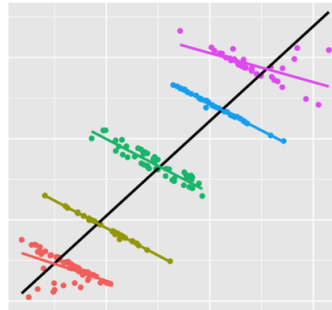
If we **have** the children **eat** now, we'll be able to go out earlier.

If we **make** the children **eat** now, we'll be able to go out earlier.

If we **get** the children **to** eat now, we'll be able to go out earlier.

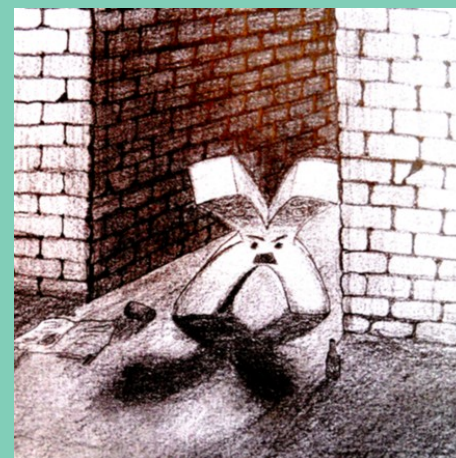
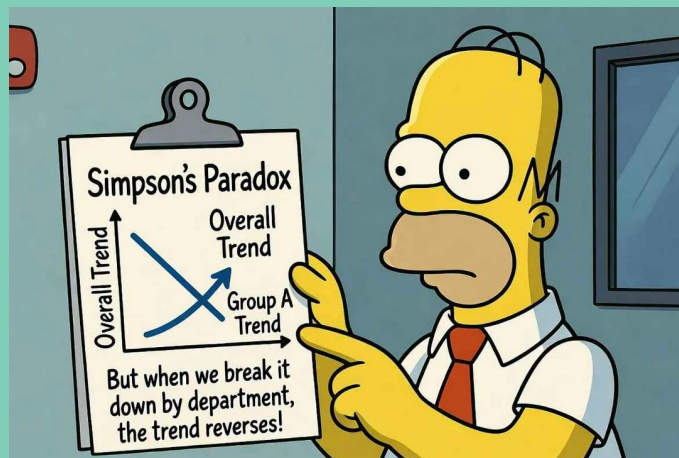
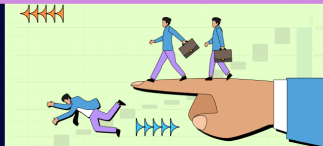
Misinformation

Misleading
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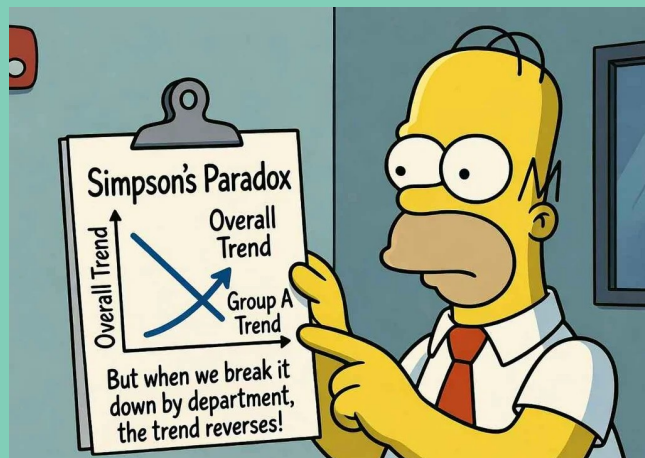
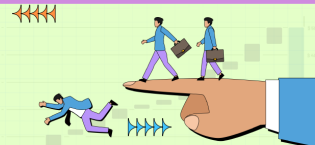
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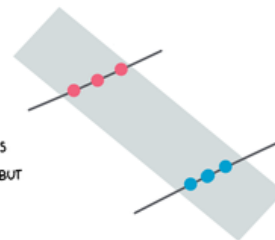
Misinformation

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SIMPSON'S PARADOX

A PROBLEM IN STATISTICS WHERE TRENDS
APPEAR IN DIFFERENT GROUPS OF DATA BUT
DISAPPEAR (OR EVEN REVERSE) WHEN
THESE GROUPS ARE COMBINED.



EVERYDAYCONCEPTS.IO

GABRIEL KRAISHOK

Misinformation

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Lurking variables

- External variables that is not considered, but it affects a study.
 - Think hidden factor (not what you are researching)

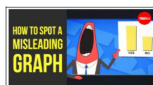
Example:

- Study on lung cancer and eating chocolate (only ask individuals if they have lung cancer and if they eat chocolate).
 - Study may show people who eat chocolate have a higher chance of getting lung cancer.
 - But the confounding/lurking variable is whether the individual has a history of smoking.

THE LURKING
VARIABLE



Misinformation



PART 3: How to spot a misleading graph

1. In each case, how would you manipulate people into believing what you want? What kind of misleading graph should you resort to? What strategy can you rely upon to distort the information?

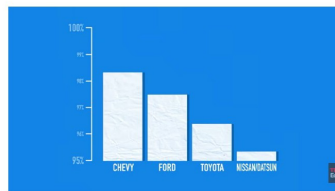
Clearly identify the effect expected in order to design the misleading graph.

a. The brand Chevy wants to claim in an ad they make the most reliable trucks in America: 98% of all Chevy trucks sold in the last 10 years are still on the road. The data for the other brands are: 97.5% for Ford, 96.5% for Toyota and 95.5% for Nissan/Datsun. How can they impress customers?	b. Fox News aims at highlighting a dramatic increase in American unemployment from 2008 to 2010.
c. To sell more expensive ads, you are required to make it look like the Super Bowl's popularity is exploding by presenting data related to its viewership.	d. A global warming sceptic organization wants you to present the evolution of annual global ocean average temperatures from 1880 to 2016.

Misinformation

Strategies: Relevant data left out – Distortion of the y-axis – Selection of specific data points (cherry picking) – Inconsistent scale – Overall context and full significance omitted – Time range carefully chosen (cherry picking)

a. The brand Chevy wants to claim in an ad they make the most reliable trucks in America: 98% of all Chevy trucks sold in the last 10 years are still on the road. The data for the other brands are: 97.5% for Ford, 96.5% for Toyota and 95.5% for Nissan/Datsun. How can they impress customers figures?



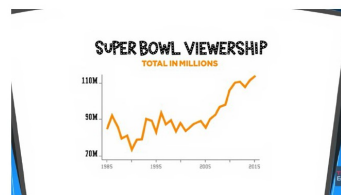
Strategy :

b. Fox News aims at highlighting a dramatic increase in American unemployment from 2008 to 2010.



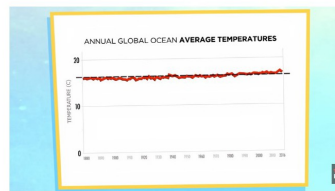
Strategy:

c. To sell more expensive ads, you are required to make it look like the Super Bowl's popularity is exploding by presenting data related to its viewership.



Strategy :

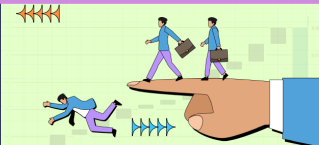
d. A global warming sceptic organization wants you to present the evolution of annual global ocean average temperatures from 1880 to 2016.



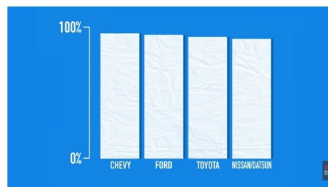
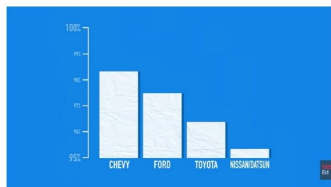
Strategy:

Misinformation

Misleading
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a. The brand Chevy wants to claim in an ad they make the most reliable trucks in America: 98% of all Chevy trucks sold in the last 10 years are still on the road. But the actual data for the other brands are: 97.5% for Ford, 96.5% for Toyota and 95.5% for Nissan/Datsun. How can they impress customers with such figures?



Strategy : **Distortion of the y-axis**

b. Fox News aims at highlighting a dramatic increase in American unemployment from 2008 to 2010.

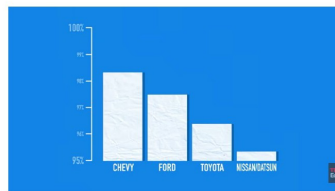


Strategy: **Inconsistent scale**, **Selection of specific data points (cherry picking)**, **Time range carefully chosen (cherry picking)**

Misinformation

Strategies: Relevant data left out – Distortion of the y-axis – Selection of specific data points (cherry picking) – Inconsistent scale – Overall context and full significance omitted – Time range carefully chosen (cherry picking)

a. The brand Chevy wants to claim in an ad they make the most reliable trucks in America: 98% of all Chevy trucks sold in the last 10 years are still on the road. The data for the other brands are: 97.5% for Ford, 96.5% for Toyota and 95.5% for Nissan/Datsun. How can they impress customers figures?



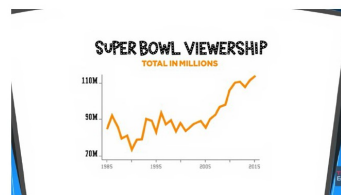
Strategy :

b. Fox News aims at highlighting a dramatic increase in American unemployment from 2008 to 2010.



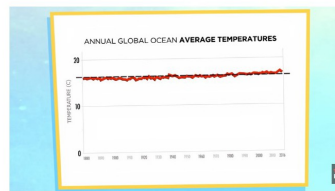
Strategy:

c. To sell more expensive ads, you are required to make it look like the Super Bowl's popularity is exploding by presenting data related to its viewership.



Strategy :

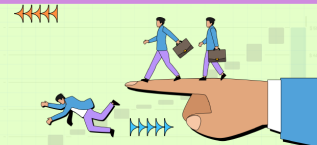
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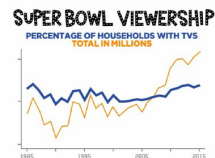
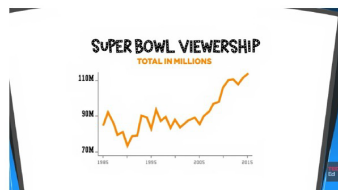
Strategy:

Misinformation

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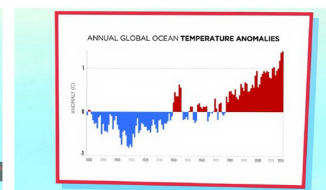
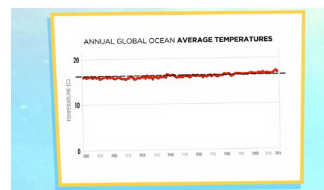


c. To sell more expensive ads, you are required to make it look like the Super Bowl's popularity is exploding by presenting data related to its viewership.



Strategy : Relevant data left out

d. A global warming sceptic organization wants you to present the evolution of annual global ocean average temperatures from 1880 to 2016.



Strategy: Overall context and full significance omitted

Misinformation



3. How would you question the following assertions? What is hidden behind the data?
- a. Industry trials of drugs are much more likely to show positive results than government-funded studies of the same drugs.
-
- b. The number of phones sold by a company has dramatically increased.
-
-

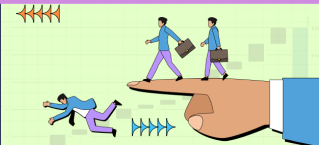
Misinformation



3. How would you question the following assertions? What is hidden behind the data?
- Industry trials of drugs are much more likely to show positive results than government-funded studies of the same drugs. **Scientists in private companies are more likely to report only their positive trials (cherry picking), and its is then assumed all trials are the same.**
 - The number of phones sold by a company has dramatically increased. **The company resorted to cumulative data (adding each successive input in the data set up > every phone sold ever – the graph will always be rising) rather than annual data (showing the data for each individual year, which could be increasing or decreasing), to make their sales appear larger than they actually are.**

Science (under scrutiny) in the news

Misleading
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Part 4: Can you spot the problems with these headlines?

How is science made more attractive in the news? In medicine notably, there is often a disconnect between news headlines and the scientific research they cover. That's because a headline is designed to catch attention: it is most effective when it makes a big claim.



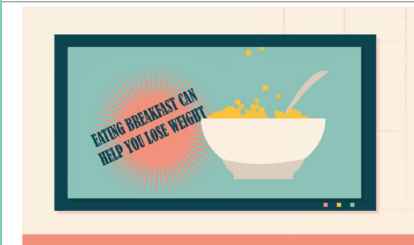
1. Would you be manipulated by the following headlines? Or can you identify a potential distortion of information? What makes these headlines misleading?

**HEALTHIUM
REDUCES
RISK OF
HEART DISEASE**

A study finds that the participants taking a vitamin called Healthium had a higher level of healthy cholesterol than those taking a placebo. Their levels became similar to those of people with naturally high levels of this kind of cholesterol. Previous research has shown that people with naturally high levels of healthy cholesterol have lower rates of heart disease.

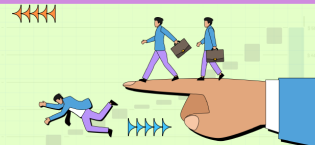
Answer:

Science (under scrutiny) in the news

 <p>HEALTHIUM REDUCES RISK OF HEART DISEASE</p>	<p>A study finds that the participants taking a vitamin called Healthium had a higher level of healthy cholesterol than those taking a placebo. Their levels became similar to those of people with naturally high levels of this kind of cholesterol. Previous research has shown that people with naturally high levels of healthy cholesterol have lower rates of heart disease.</p>	<p>Answer:</p>
 <p>EATING CHOCOLATE REDUCES STRESS IN STUDENTS</p>	<p>This hypothetical study recruits 10 students. Half begin consuming a daily dose of chocolate, while half abstain. As classmates, they all follow the same schedule. By the end of the study, the chocolate eaters are less stressed than their chocolate-free counterparts.</p>	<p>Answer:</p>
 <p>EATING BREAKFAST CAN HELP YOU LOSE WEIGHT</p>	<p>Researchers recruit a group of people who had always skipped breakfast and ask them to start eating breakfast every day. The participants include men and women of a range of ages and backgrounds. Over a year-long period, participants lose an average of five pounds.</p>	<p>Answer:</p>

Science (under scrutiny) in the news

Misleading
Statistics
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HEART ATTACK
RATE / MILLION

500
400
300
200
100
0

EVIDENCE BASED

NATURAL HDL

HEART ATTACK RISK WITH
NATURAL HDL

HEART ATTACK
RATE / MILLION



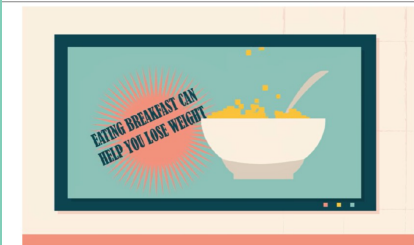
500
400
300
200
100
0

ASSUMED

ELEVATED HDL
FROM HEALTHIUM

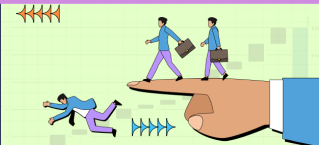
HEART ATTACK RISK WITH
ELEVATED HDL

Science (under scrutiny) in the news

 <p>HEALTHIUM REDUCES RISK OF HEART DISEASE</p>	<p>A study finds that the participants taking a vitamin called Healthium had a higher level of healthy cholesterol than those taking a placebo. Their levels became similar to those of people with naturally high levels of this kind of cholesterol. Previous research has shown that people with naturally high levels of healthy cholesterol have lower rates of heart disease.</p>	<p>Answer:</p>
 <p>EATING CHOCOLATE REDUCES STRESS IN STUDENTS</p>	<p>This hypothetical study recruits 10 students. Half begin consuming a daily dose of chocolate, while half abstain. As classmates, they all follow the same schedule. By the end of the study, the chocolate eaters are less stressed than their chocolate-free counterparts.</p>	<p>Answer:</p>
 <p>EATING BREAKFAST CAN HELP YOU LOSE WEIGHT</p>	<p>Researchers recruit a group of people who had always skipped breakfast and ask them to start eating breakfast every day. The participants include men and women of a range of ages and backgrounds. Over a year-long period, participants lose an average of five pounds.</p>	<p>Answer:</p>

Science (under scrutiny) in the news

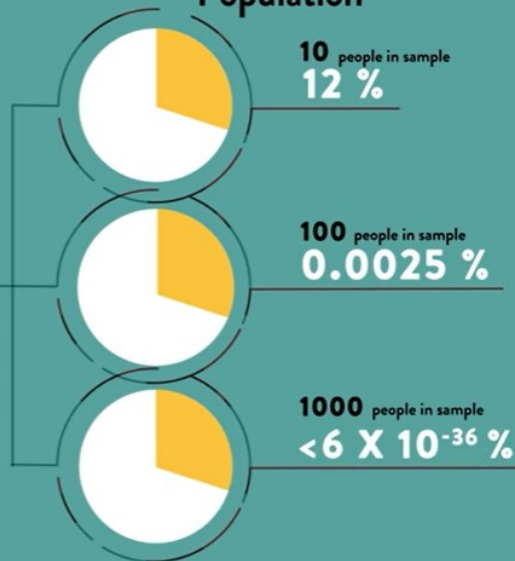
Misleading
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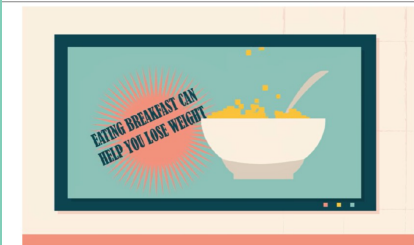
Sample group



Population



Science (under scrutiny) in the news

 <p>HEALTHIUM REDUCES RISK OF HEART DISEASE</p>	<p>A study finds that the participants taking a vitamin called Healthium had a higher level of healthy cholesterol than those taking a placebo. Their levels became similar to those of people with naturally high levels of this kind of cholesterol. Previous research has shown that people with naturally high levels of healthy cholesterol have lower rates of heart disease.</p>	<p>Answer:</p>
 <p>EATING CHOCOLATE REDUCES STRESS IN STUDENTS</p>	<p>This hypothetical study recruits 10 students. Half begin consuming a daily dose of chocolate, while half abstain. As classmates, they all follow the same schedule. By the end of the study, the chocolate eaters are less stressed than their chocolate-free counterparts.</p>	<p>Answer:</p>
 <p>EATING BREAKFAST CAN HELP YOU LOSE WEIGHT</p>	<p>Researchers recruit a group of people who had always skipped breakfast and ask them to start eating breakfast every day. The participants include men and women of a range of ages and backgrounds. Over a year-long period, participants lose an average of five pounds.</p>	<p>Answer:</p>

Science (under scrutiny) in the news



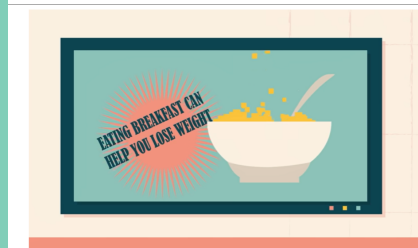
A study finds that the participants taking a vitamin called Healthium had a higher level of healthy cholesterol than those taking a placebo. Their levels became similar to those of people with naturally high levels of this kind of cholesterol. Previous research has shown that people with naturally high levels of healthy cholesterol have lower rates of heart disease.

Answer: The research did not actually investigate whether Healthium reduces heart disease. It only measured Healthium's impact on levels of a particular kind of cholesterol. The fact that people with naturally high levels of that cholesterol have lower risks of heart attacks doesn't mean that the same will be true of people who elevate their cholesterol levels using Healthium.



This hypothetical study recruits 10 students. Half begin consuming a daily dose of chocolate, while half abstain. As classmates, they all follow the same schedule. By the end of the study, the chocolate eaters are less stressed than their chocolate-free counterparts.

Answer: It's a stretch to draw a conclusion about students in general from a sample of ten. That's because the fewer participants are in a random sample, the less likely it is that the sample will closely represent the target population as a whole (for example, consider the distribution of males and females – the chances of skewing the distribution is higher with a small sample).

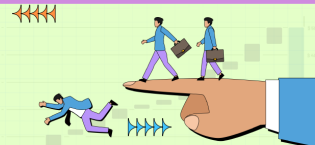


Researchers recruit a group of people who had always skipped breakfast and ask them to start eating breakfast every day. The participants include men and women of a range of ages and backgrounds. Over a year-long period, participants lose an average of five pounds.

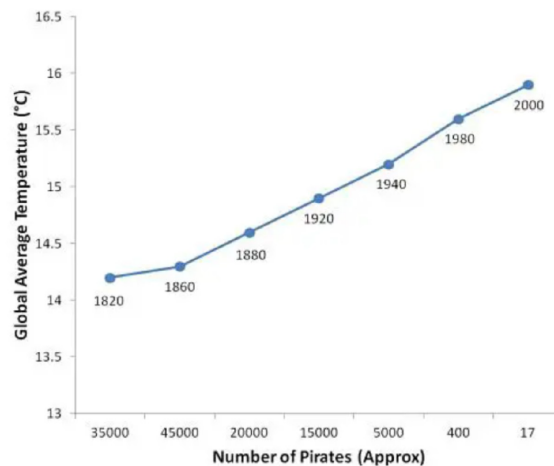
Answer: The people in the study started eating breakfast and lost weight – but we don't know that they lost weight because they started eating breakfast; perhaps having their weight tracked inspired them to change their eating habits in other ways. To rule out the possibility that some other factor caused weight loss, we would need a comparison group (who didn't eat breakfast before and continued to skip it).

Science (under scrutiny) in the news

Misleading
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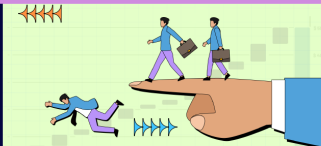


2. Comment upon the following statement.
Pirates are responsible for global warming.



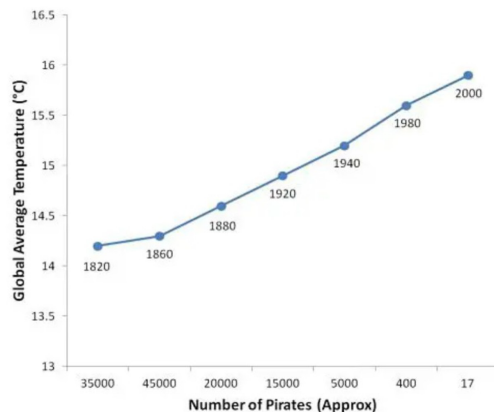
Science (under scrutiny) in the news

Misleading Statistics in the Media: Examples and How to Spot Them



2. Comment upon the following statement.
Pirates are responsible for global warming.

First one notices that the number of pirates is shrinking over time while the global average temperature is increasing – it is even less likely that plummeting pirates are responsible for global warming than a soaring number of pirates would. But most of all, correlation is not causation.



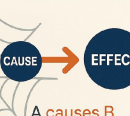
Correlation vs. Causation:
Untangling the Web of Relationships

CORRELATION



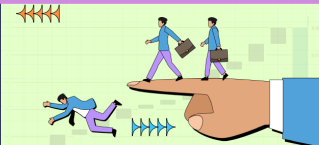
A relationship between two variables

CAUSATION



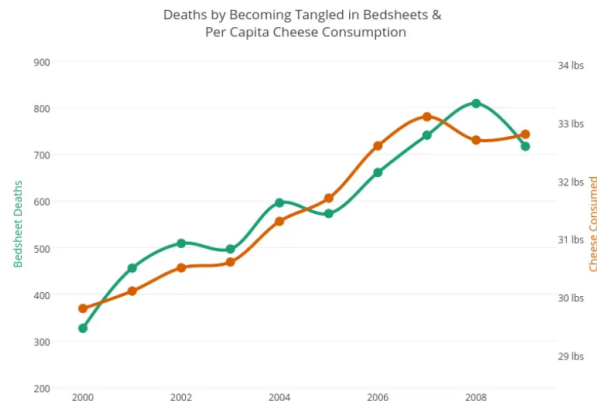
Science (under scrutiny) in the news

Misleading
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Spot Them



3. Death by Tangled Bedsheets and Cheese Consumption

Of most concern: Why has death by tangled bedsheets increased by over 200% between 2000 and 2009?



Source: Spurious Correlations