

Part 3

Providing evidence

Alexei Kaptelev

**How can
I be more
confident?**

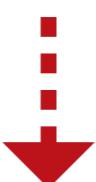
Dangerous belief:

*I say it louder than anybody,
or with greater confidence therefore I must be
correct.*

Evidence

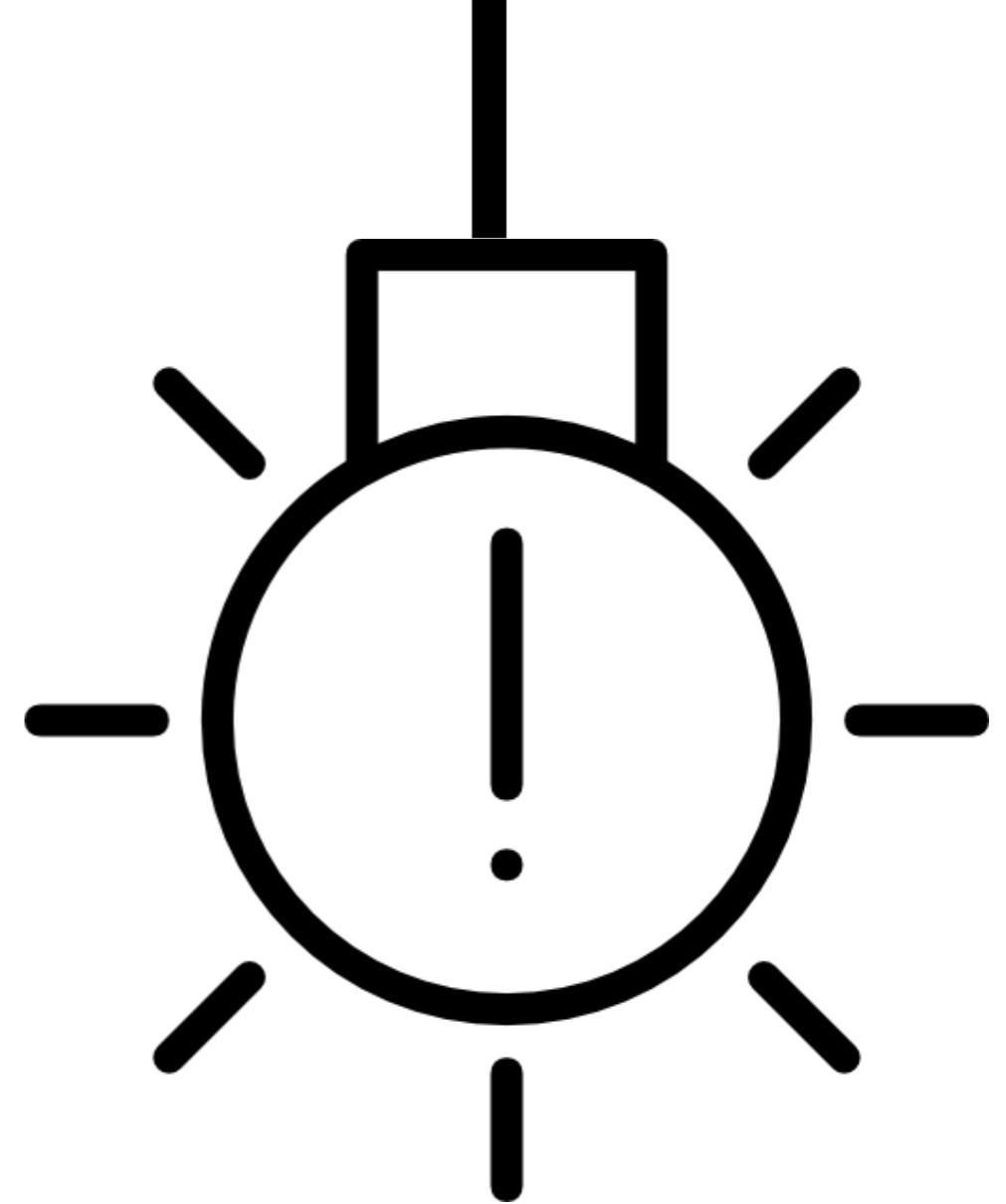


Conviction



Confidence

**CONVINCE
YOURSELF
BEFORE
CONVINCING
OTHERS**



**What is
a convincing
evidence?**

Appeal to:

Faith

Tradition

Intuition

Reason

Appeal to:

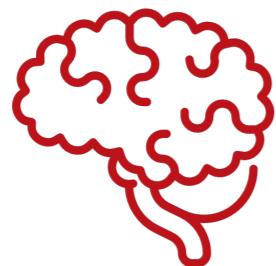
Faith

Tradition

Intuition

Reason

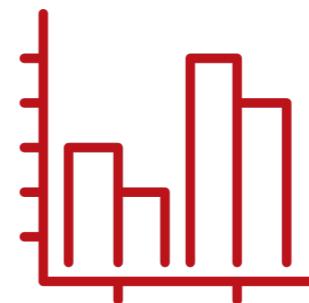
Types of evidence



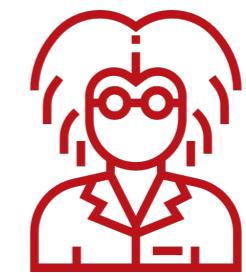
Causal



Anecdotal



Statistical



Expert

Why we should open a burger joint?

Causal

Less competition as there are no burger joints in the neighborhood

Anecdotal

My brother opened a burger joint and he made millions

Statistical

According to the data, it's the most profitable kind of fast food

Expert

Experts say that burgers are hip and trendy

**What is the
most convincing
evidence?**

STORIES!!!

STORY PROOF

The Science Behind the Startling
Power of Story

KENDALL HAVEN



Westport, Connecticut • London

Statistical and causal evidence are more persuasive than anecdotal evidence. As one study suggests that expert evidence too is more persuasive than anecdotal evidence, the overall, tentative conclusion would be that anecdotal evidence is the least persuasive type of evidence.

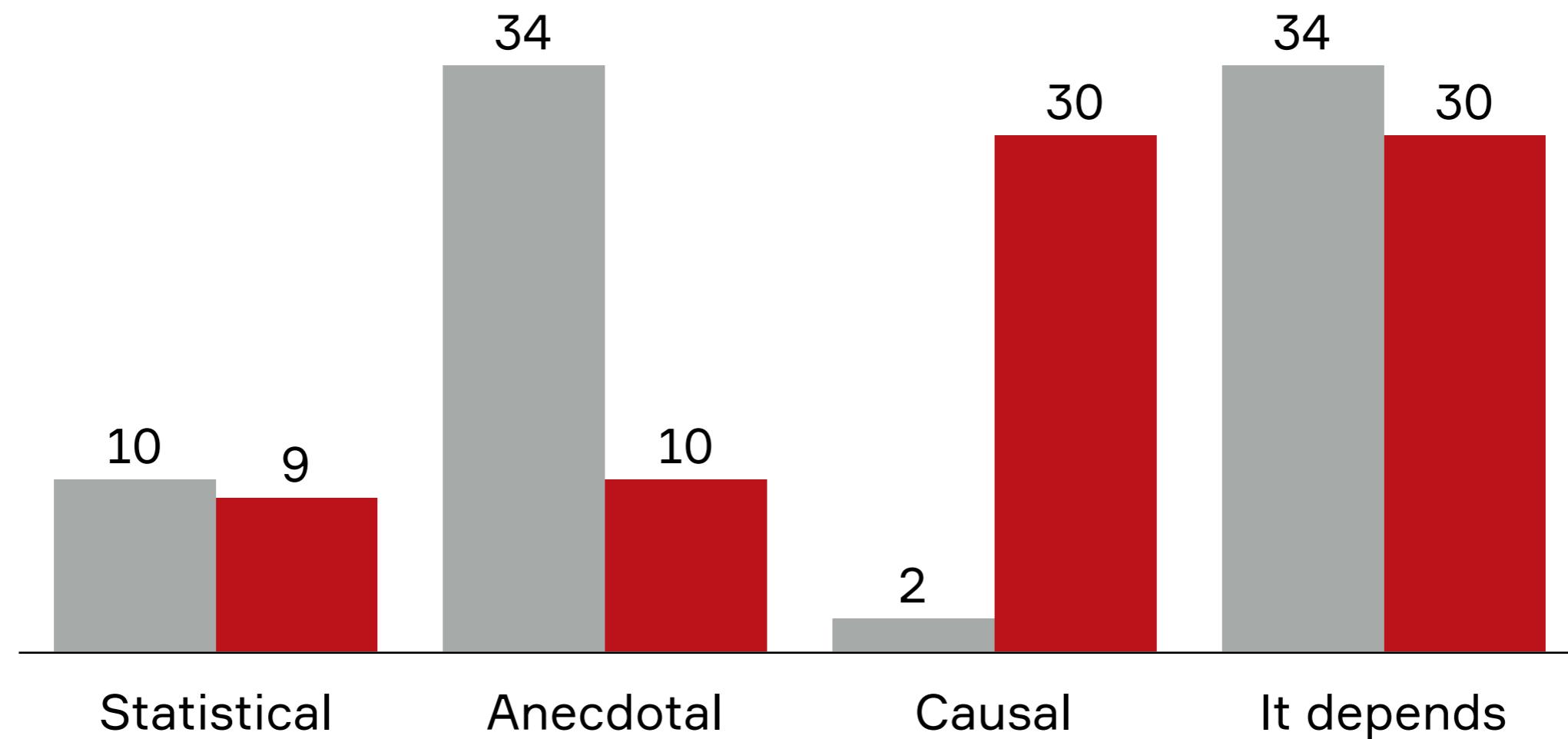
JOS HORNIKX

A review of experimental research on the relative persuasiveness of anecdotal, statistical, causal, and expert evidence.

Studies in Communication Sciences 5/1 (2005) 205-216

WHAT'S MORE CONVINCING?

- For other people*
- For me*

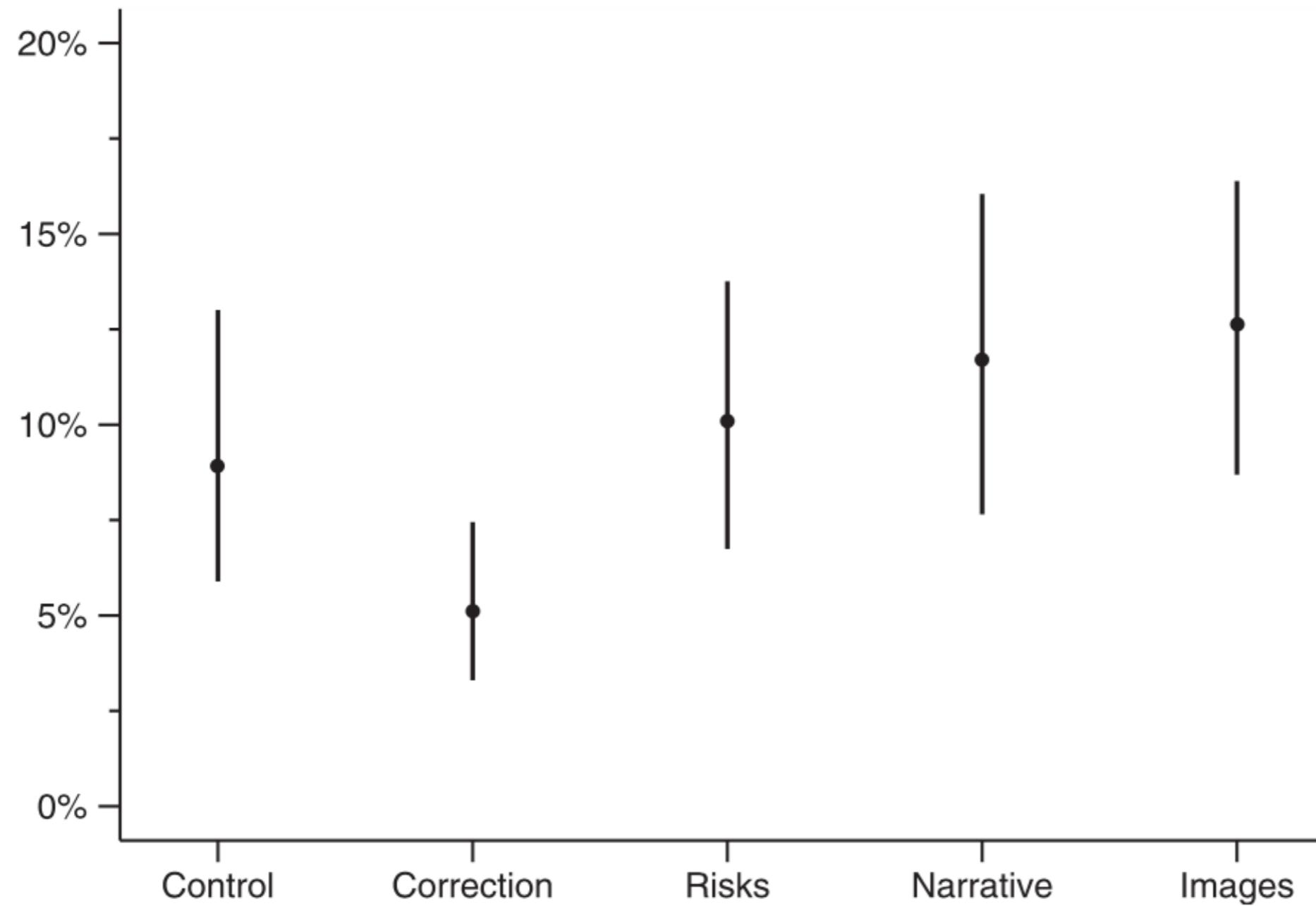


Vaccines **DO NOT** cause autism

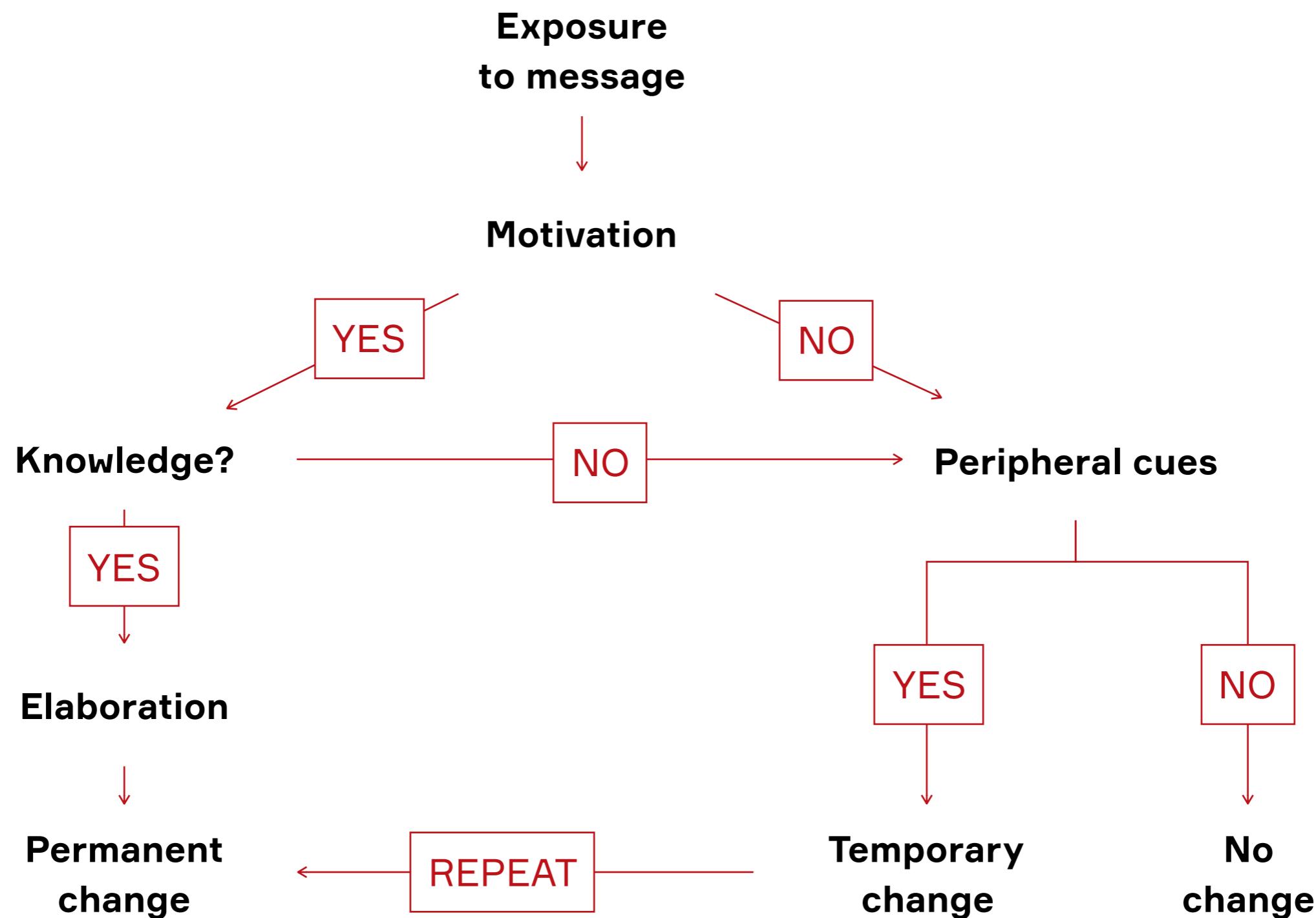
Effective Messages in Vaccine Promotion: A Randomized Trial, Brendan Nyhan et al

- 1. Control:** no intervention
- 2. Correction:** scientific studies
- 3. Risks:** describing risks of not vaccinating
- 4. Narrative:** mother's story
- 5. Images:** pictures of children with disease

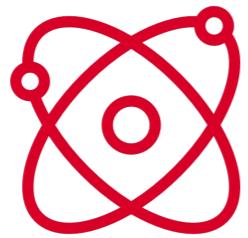
Vaccines cause autism: strongly agree



ELABORATION LIKELIHOOD MODEL



Richard E. Petty & John Cacioppo



Science



Business



Politics

Causal

**THIS IS NOT
A COURSE
ON LOGIC**

For the purposes of this course

**Causal
evidence** = **Logical
evidence**

- ❖ Deductive
 - ❖ Inductive
 - ❖ Abductive

Deductive

All children are creative.

Peter is a child.

Therefore, Peter is creative.

**In deductive arguments
conclusion follows with 100%
certainty.**

*All conclusions are equally strong but one
should always question the premise.*

C-players never develop their staff.

John is a C-player.

John will not develop his staff.

Inductive

My son is creative.

Your daughter is creative.

All children are creative.

**With inductive arguments
conclusion follows with some
degree of certainty.**

There could be stronger and weaker arguments.

Inductive

Mice are mammals

Humans are mammals too

Therefore what cures cancer in
mice might work for humans

Analogy is a form of inductive reasoning

Abductive

Children are creative.

Peter is creative.

Peter is probably a child
(or at least have certain
child-like qualities)

**Like induction, abduction
deals with probability and
needs an additional test.**

There could be stronger and weaker arguments.

3 types of errors

1

**Invalid
conclusions**

2

**Weak
conclusions**

3

**False
premises**

Invalid conclusions

All children are creative.

Peter is creative.

Therefore, Peter is a child.

Weak conclusions

The spike in traffic to my website yesterday was a result of a guest post I published on a popular blog.

Weak conclusions

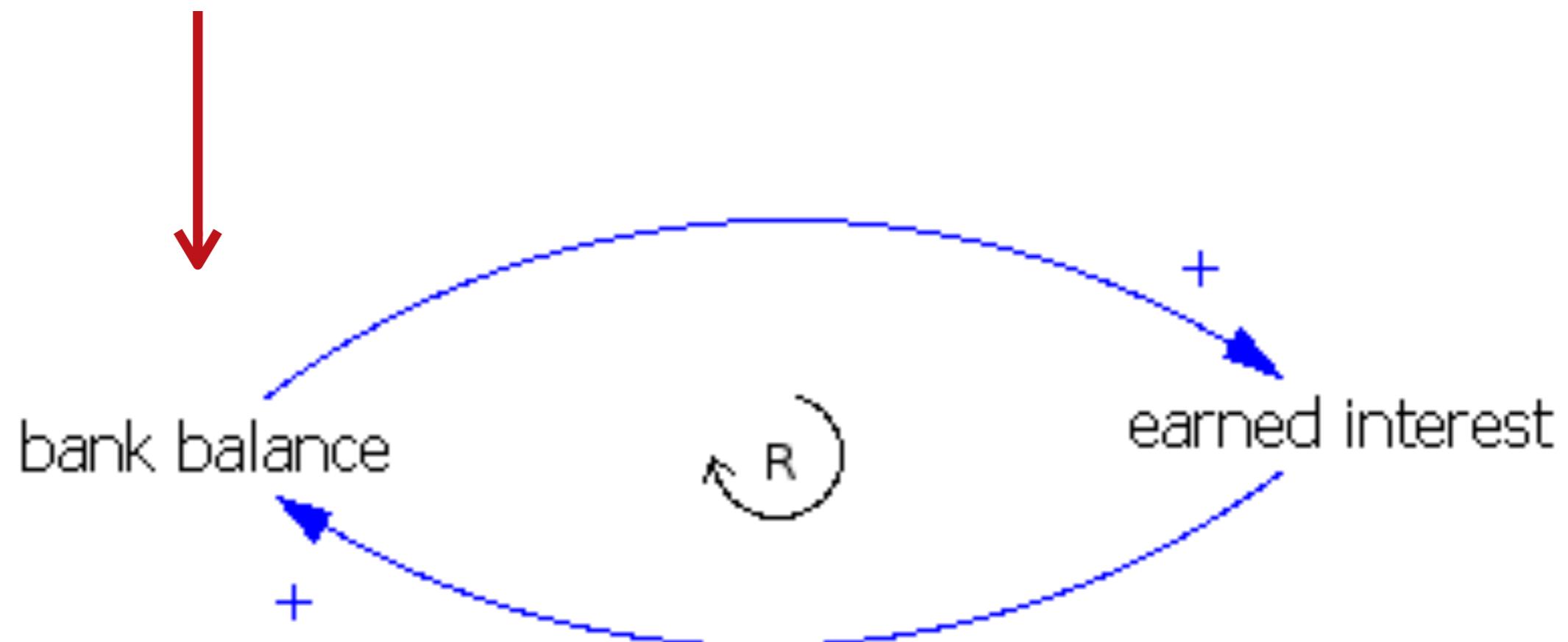
Children are creative

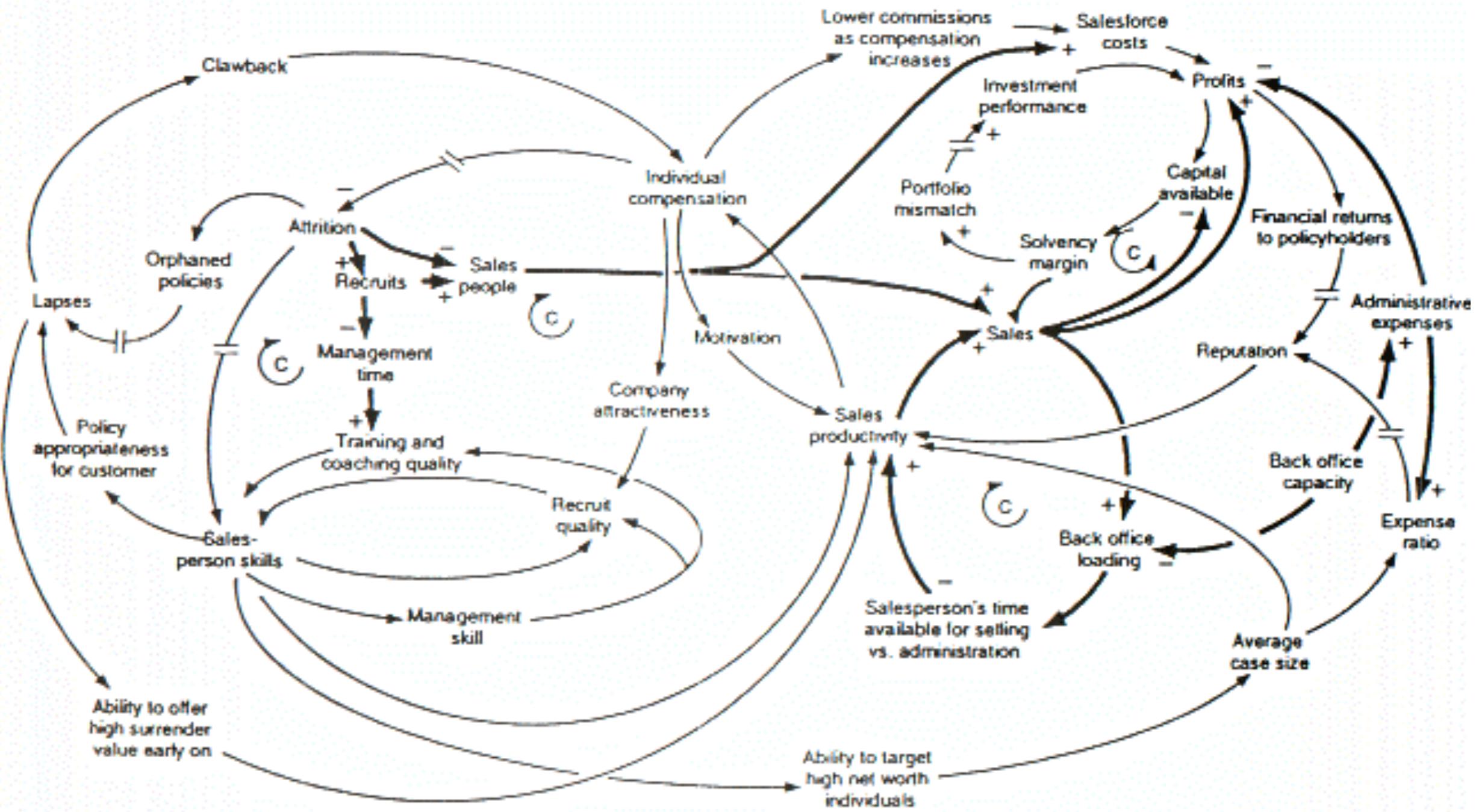
Our school system values non-creative
subjects over creative

So children become less creative

**Are there
other factors?**

Other factors





False premises

Shareholder employees perform better
than non-shareholder employees

Steve is not a shareholder

Let's make Steve a shareholder, he will
be more productive

False premises

All swans are white.

Adam is a swan.

Therefore, Adam is white.



Is that a fact?

To sum things up:

1. Causal evidence is persuasive, but
2. What's the degree of certainty?
3. Are your assumptions justified?

Anecdotal

STORIES ABOUT PHYSICISTS, WHO:

1. Struggled intellectually

Made mistakes in investigating problems

2. Struggled in their personal life

Suffered family poverty and lack of parental support

3. Made great discoveries

A control condition, similar to many science textbooks

<https://www.apa.org/pubs/journals/releases/edu-edu0000092.pdf>



Exposing students to scientists' struggle stories improved their science-class performance (in terms of class grades), whereas exposing students to achievement stories did not.

Xiaodong Lin-Siegler

Effects of Learning About Great Scientists' Struggles on High School Students' Motivation to Learn Science



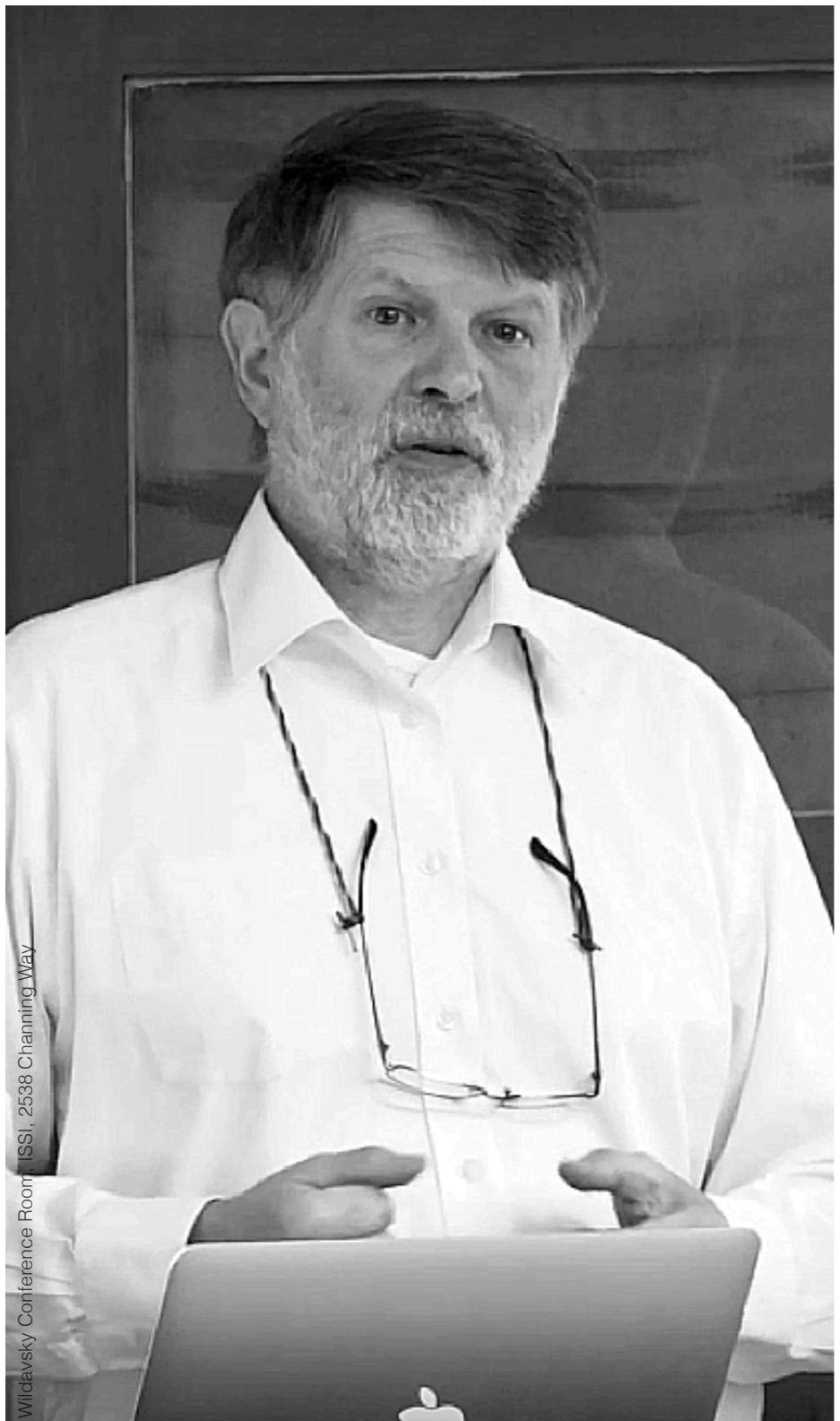
Accuracy is an issue

Did that really happen?





snopes.com



Wildavsky Conference Room | ISSI, 2538 Channing Way

Storytellers have always enjoyed a license to embroider and embellish their accounts, even at the cost of sacrificing historical accuracy

Yiannis Gabriel

Organizing Words: A Thesaurus for Social and Organizational Studies

A story is a great
motivator but it's
a weak evidence

“A story is not an evidence”



MEDICINE

THE HIERARCHY OF EVIDENCE

in medical practice

1. Systematic reviews and meta-analyses
2. Randomized controlled trials with definitive results
3. Randomized controlled trials with non-definitive results
4. Cohort studies
5. Case-control studies
6. Cross sectional surveys
7. Case reports

Greenhalgh T (July 1997). "How to read a paper. Getting your bearings (deciding what the paper is about)"



LEGAL STANDARDS FOR BURDEN OF PROOF

1. Reasonable suspicion
2. Reasonable to believe
3. Probable cause for arrest
4. Some credible evidence
5. Substantial evidence
6. Preponderance of the evidence
7. Clear and convincing evidence
8. Beyond reasonable doubt

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[https://en.wikipedia.org/wiki/Burden_of_proof_\(law\)](https://en.wikipedia.org/wiki/Burden_of_proof_(law))

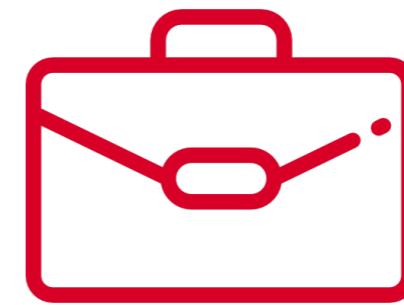
Case-based reasoning



Medicine



Law



Business

WHERE TO USE STORIES

- ❖ Illustrative / Analogy
- ❖ Critical instance
- ❖ Pilot study

John Truby

PRESENTS

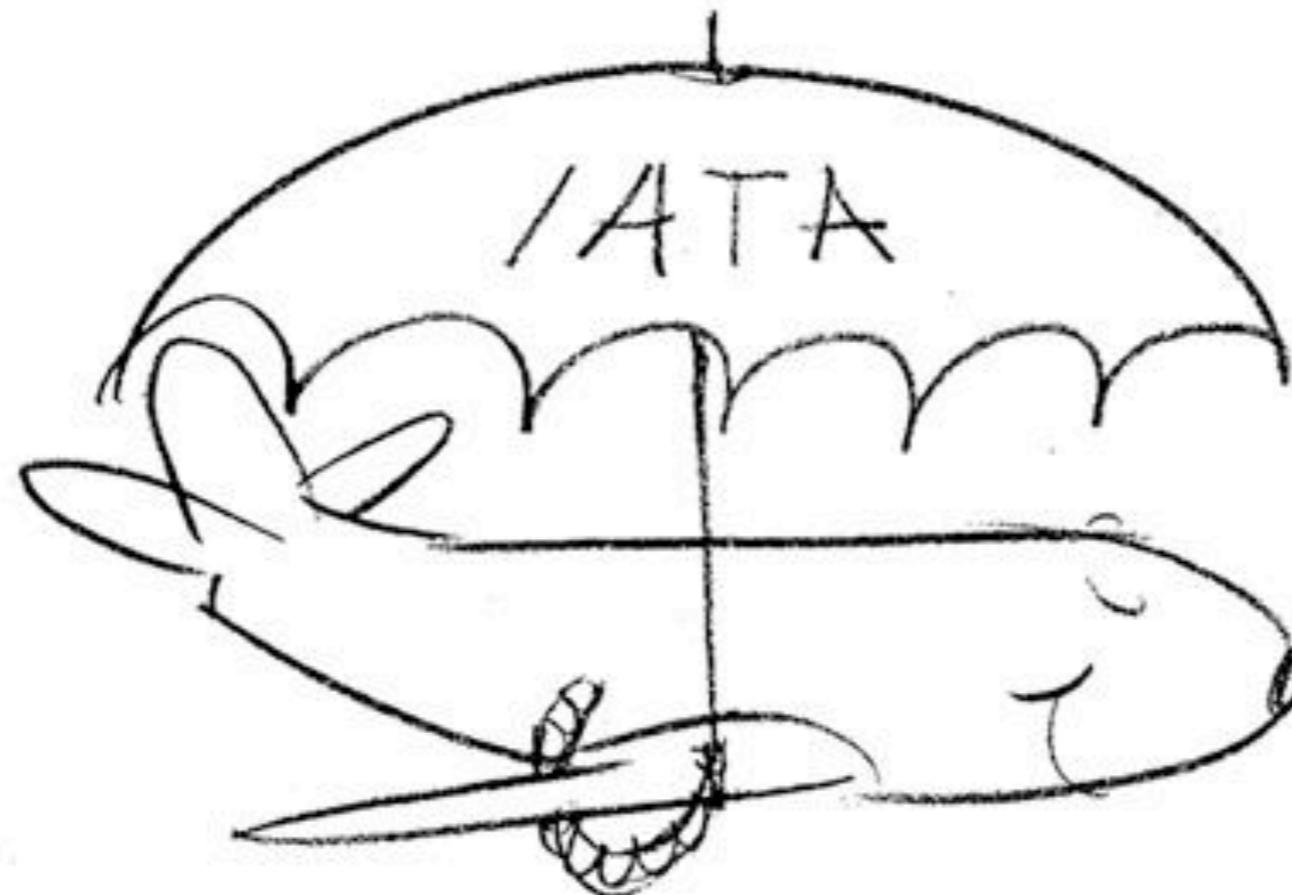


T H E
A N A T O M Y
O F S T O R Y

22 Steps to Becoming a Master Storyteller

"A comprehensive guide to writing stories of all kinds...Invaluable to any writer looking to put an idea to paper." —Kristine Huntley, Booklist

- 1. Weakness**
2. Desire
3. Opponent
4. Plan
5. Insight
6. Battle
7. New balance



We were a healthy, profitable company for 17 years.

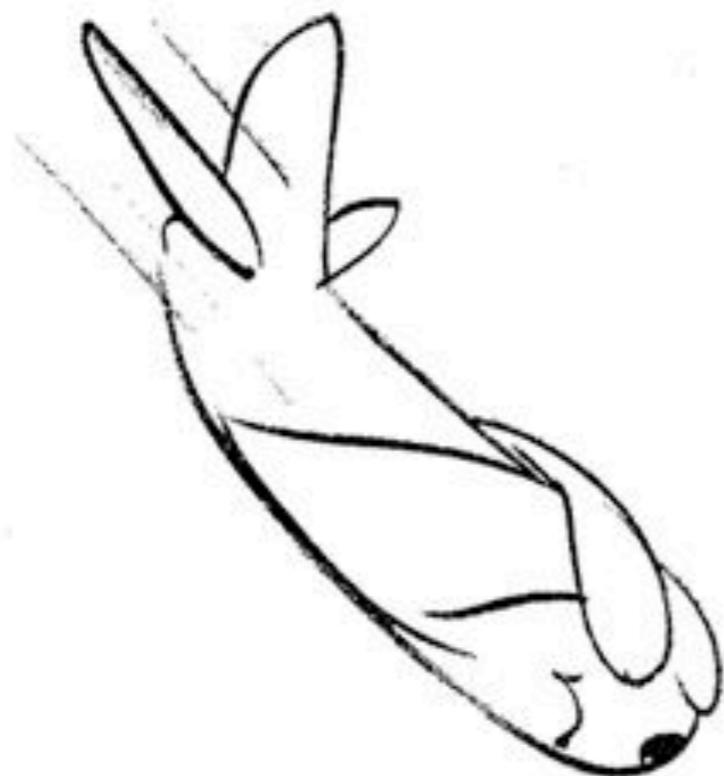
Business boomed, year after year.
In IATA, we and the other airlines

pretty much agreed on how we would share the increasingly abundant bag of goodies.

It was a secure and orderly world.

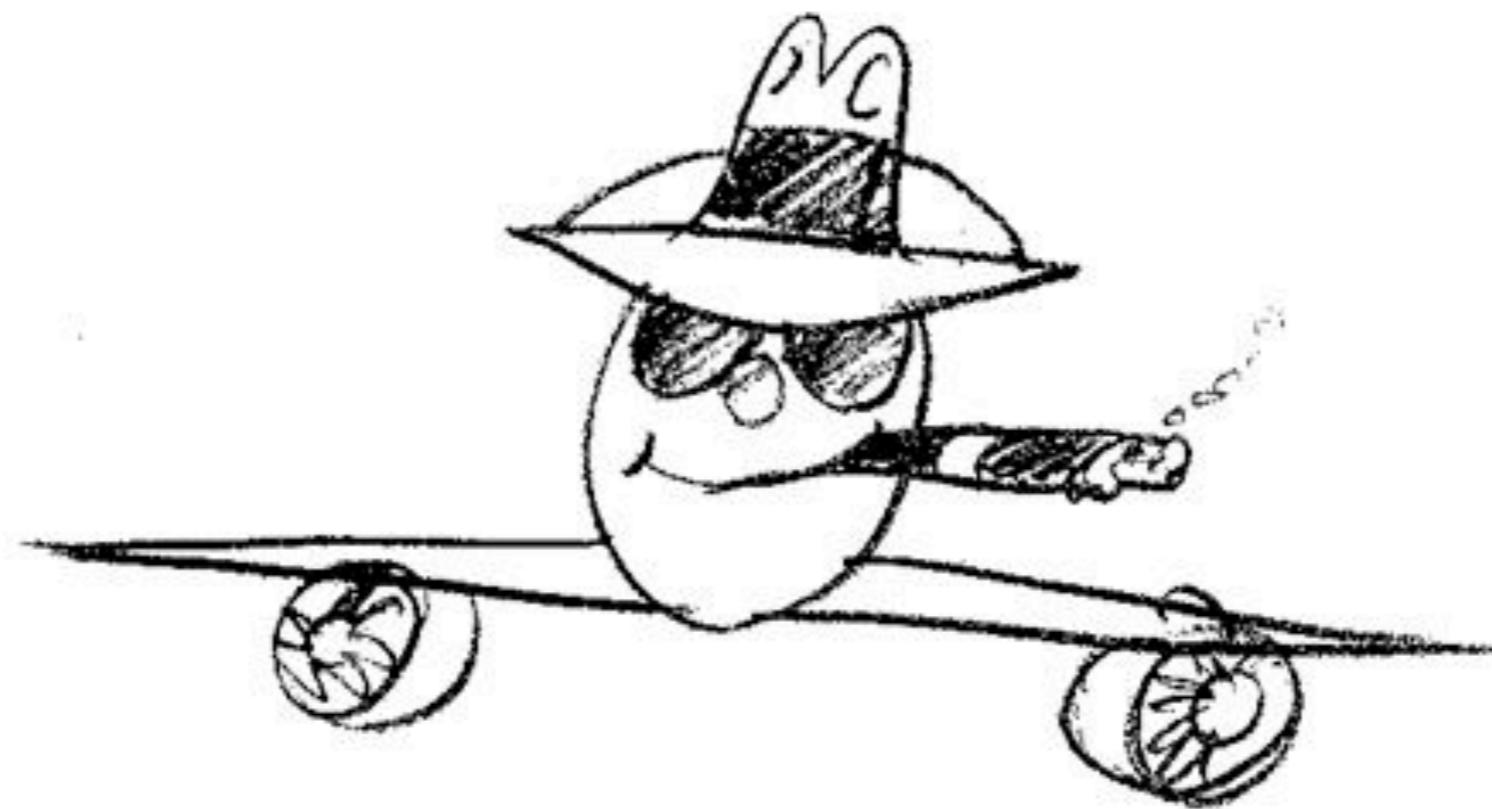
1. Weakness
2. Desire
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7. New balance

We are in bad shape. But we haven't reached the crisis point yet. If we were, we wouldn't know how to get our nose up again.



But we can. If we are ready to fight for our jobs and our future, we can recover.

1. Weakness
2. Desire
- 3. Opponent**
4. Plan
5. Insight
6. Battle
7. New balance



We've got some tough competition.
Like the "street fighters" from the
rough-and-tumble American

domestic market. Efficient. In shape.
Like Delta...

1. Weakness
2. Desire
3. Opponent
- 4. Plan**
5. Insight
6. Battle
7. New balance

This is how we are going to do it!



We have to be more efficient.



We have to consolidate.



We have to be market-oriented.

1. Weakness
2. Desire
3. Opponent
4. Plan
- 5. Insight**
6. Battle
7. New balance

We are going to zero in on the business travel market.

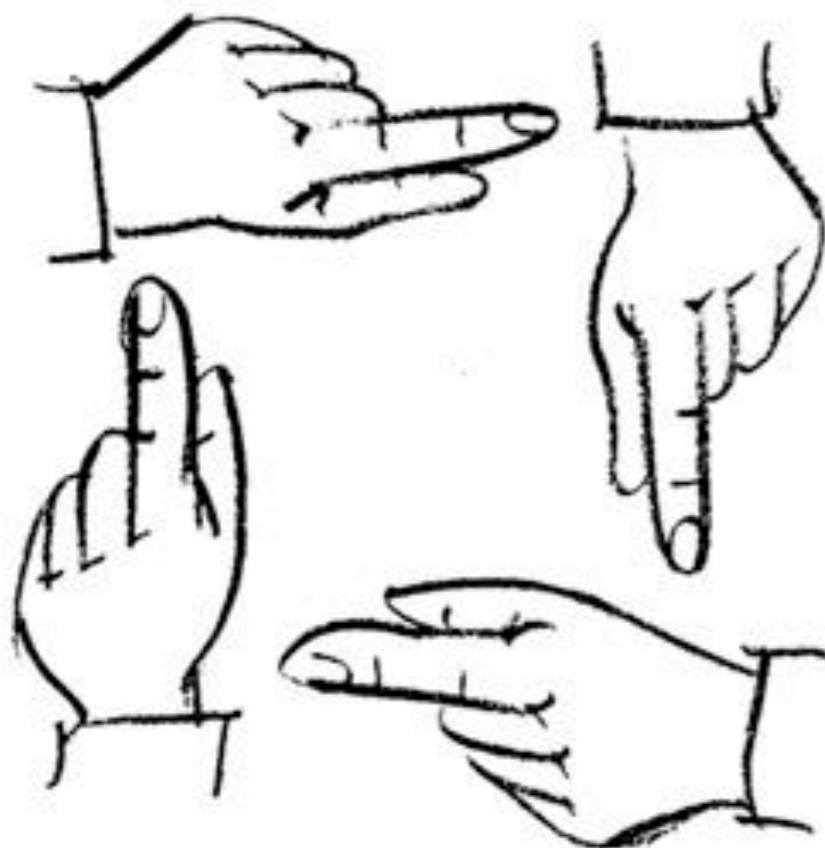
- It's big.
- It's demanding.
- It's where the money is.

Above all, we are going to capture the business travel market in Scandinavia – our home market. Half of it today is in the hands of our competitors.



1. Weakness
2. Desire
3. Opponent
4. Plan
5. Insight
- 6. Battle**
7. New balance

We've got to help each other.



If anything goes wrong, the customer doesn't care whose fault it is. He's the one who's going to suffer anyway.



If we help each other, we can put just about anything right and spare our customers a lot of grief.
But we've got to work together!

1. Weakness
2. Desire
3. Opponent
4. Plan
5. Insight
6. Battle
- 7. New balance**

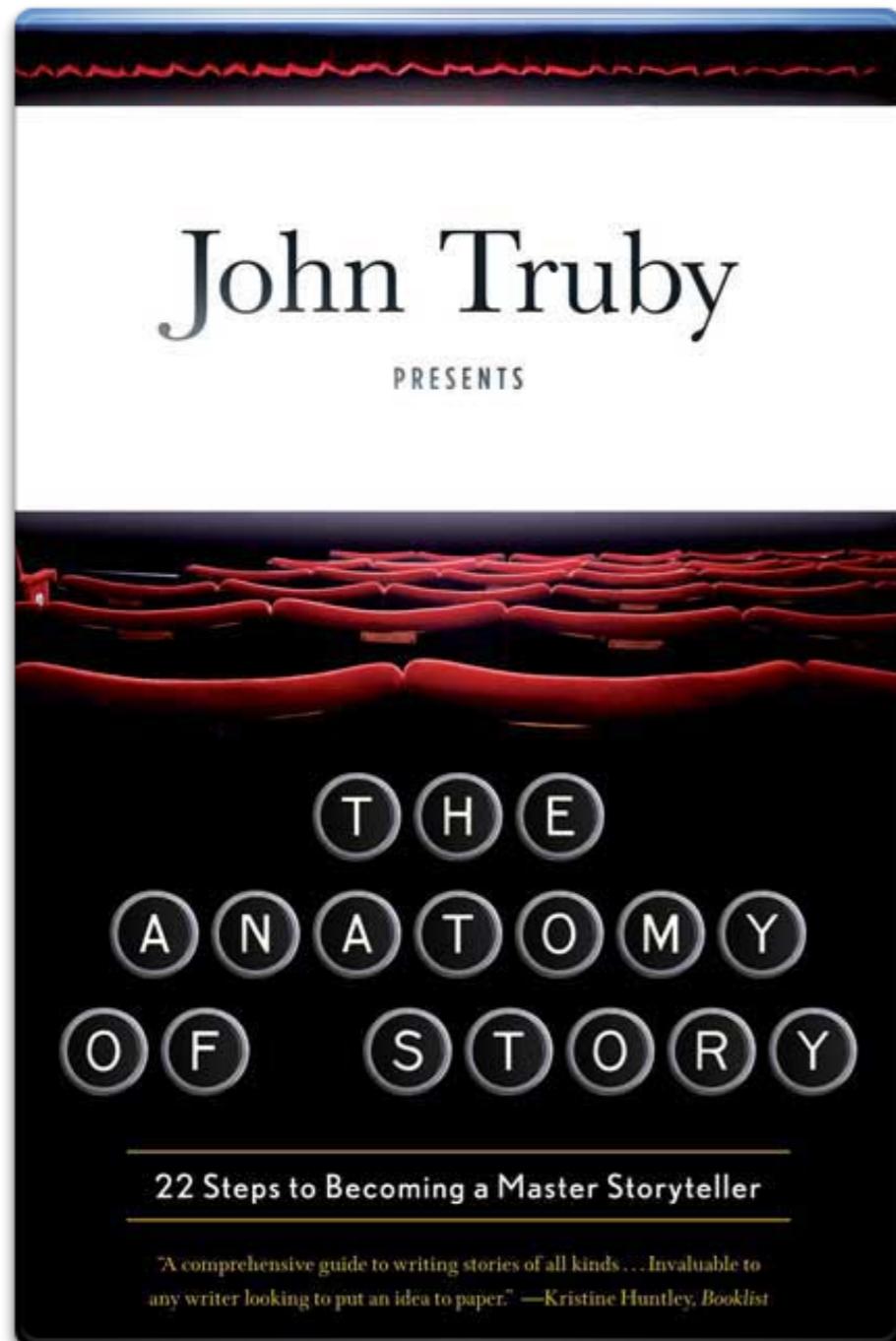
When you put it all together...

- We are slashing unnecessary costs.
- We are improving our efficiency.
- We are consolidating our operations and cutting even more costs.
- We are tailoring our products and service for the needs of the big business travel market, to increase our income.
- We are boosting our profitability with cargo and tourism.
- We are grabbing every opportunity for marginal business.
- We are going to find it's more fun to work.

...that should do it.

+2%

A 2 % improvement means some \$30 million. With that much in our pockets, we've taken the first step toward a new, profitable SAS.



7 building blocks

1. Weakness
2. Desire
3. Opponent
4. Plan
5. Insight
6. Battle
7. New balance

To sum things up:

1. Stories motivate, but it's a weak evidence
2. Case-based reasoning works in a few contexts like critical instance or pilot studies
3. Check the details – memories are faulty

Statistical

Copyrighted Material

THE NURTURE Assumption

**Why Children Turn Out
the Way They Do**

"A graceful, lucid, and utterly
persuasive assault on virtually every
tenet of child development."

—Malcolm Gladwell, *The New Yorker*

The
Classic Text
Revised
and Updated

JUDITH RICH HARRIS

FOREWORD BY STEVEN PINKER

Aggressive parents

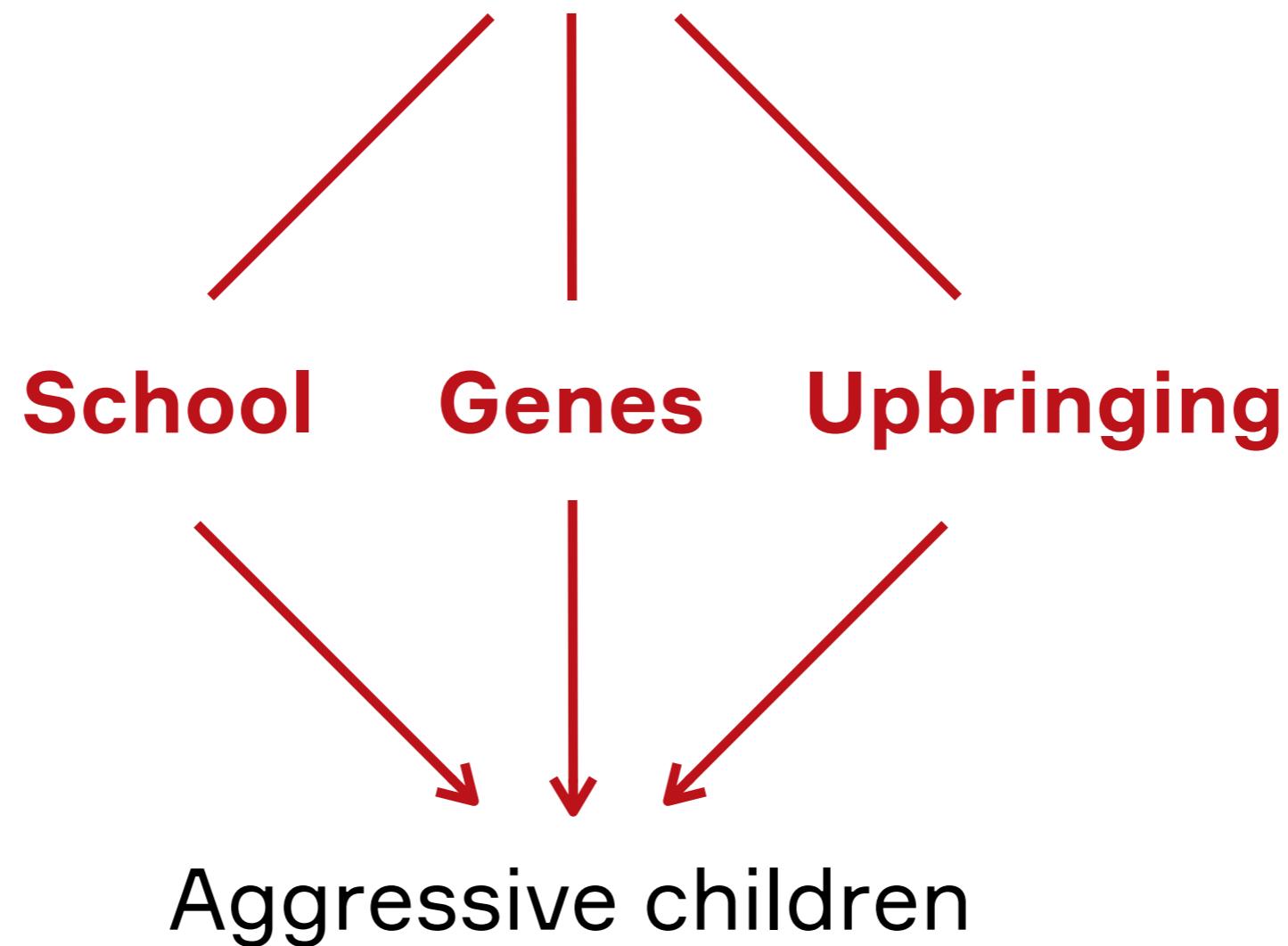


Upbringing



Aggressive children

Aggressive parents



Statistics

Statistics is central to evidence-based practice

VS

Armchair theorizing

Piling up stories

Evidence-based approach

- ❖ Medicine
- ❖ Management
- ❖ Policy-making

Ken Robinson:

Do schools kill creativity?

TED2006 · 19:24 · Filmed Feb 2006

 60 subtitle languages  View interactive transcript

Share this idea



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Link



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Embed

42,477,223 Total views

Claim

Children have extraordinary capacity for innovation and we educate children out of creativity

Evidence 1

“I mean, Sirena last night was a marvel, wasn't she?”

Evidence 2

A fictitious story

Evidence 3

A story about his son

Evidence 4

If you're not prepared to be wrong you cannot be creative and our educational system stigmatises mistakes

Are children, in fact, creative?

Creativity scores at genius level

98%

Age 5

30%

Age 10

12%

Age 15

2%

Adults

1968 research by George Land

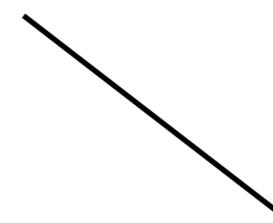
Creativity – which I define as the process
of having original ideas that have value...

KEN ROBINSON

TED, 2006

42,477,223

Total
views



Entertainment

The secret of great TED presentation

**Say things people
already believe in
(and be funny)**



Amy Cuddy:

Your body language shapes who you are

TEDGlobal 2012 · 21:02 · Filmed Jun 2012

47 subtitle languages ?

View interactive transcript



Share this idea



Facebook



LinkedIn



Twitter



Link



Email



Embed

38,035,990

Total views





High-power

Expansive



Low-power

Contractive

Effect of power posing

- 1. Self-perception changes**
- 2. People take more risks**
- 3. Hormone level changes**

<http://journals.sagepub.com/doi/abs/10.1177/0956797610383437>

- 2010** Amy Cuddy, Dana Carney and Andy Yap did the research
- 2012** The TED talk was recorded
- 2014** Eva Ranehill from University of Zurich failed to replicate the study
- 2015** Simmons & Simonsohn from Wharton analysed 33 studies and found no effect
- 2016** Katie Garrison attempted a 300-person pre-registered direct replication study

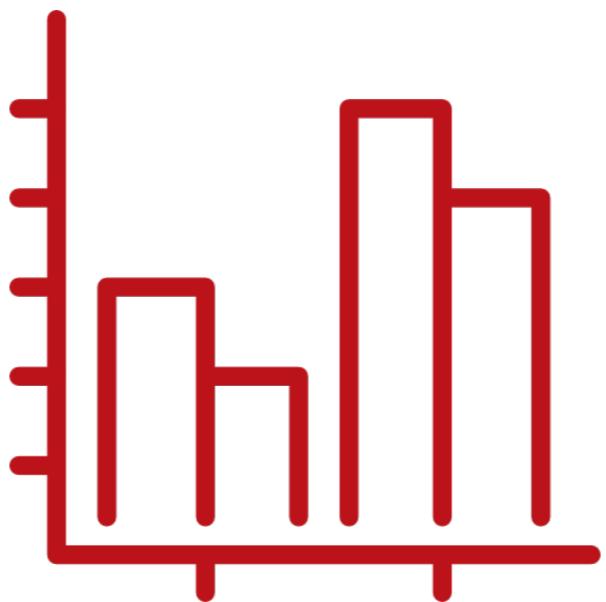


The evidence
against the
existence
of power poses
is undeniable.

Dana Carney

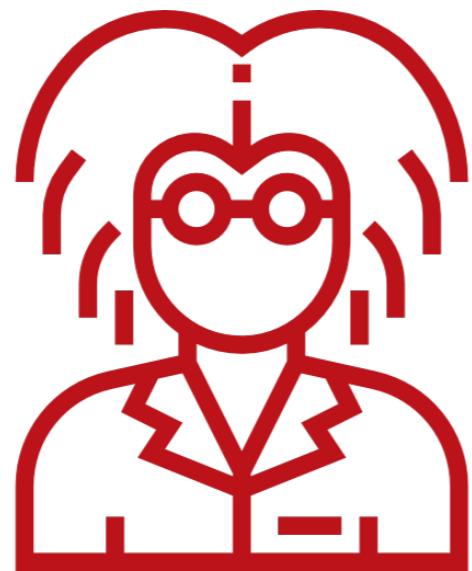
*Haas School of Business,
Berkeley, 2016*

Moral of the story:



**Take a course
on statistics**

**Few
questions
to ask**



vs



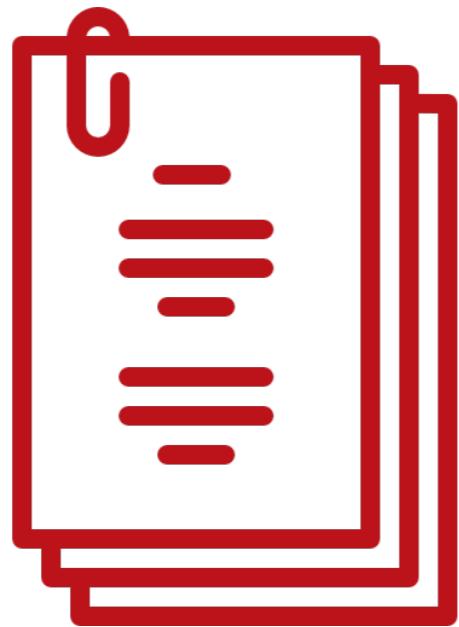
Who did the study?

*American Cancer Society or
the American Tobacco Institute*



**Was research
peer-reviewed?**

And what's the journals reputation?



vs



Is it just one study?

*Look for systematic reviews
and meta-reviews*



vs

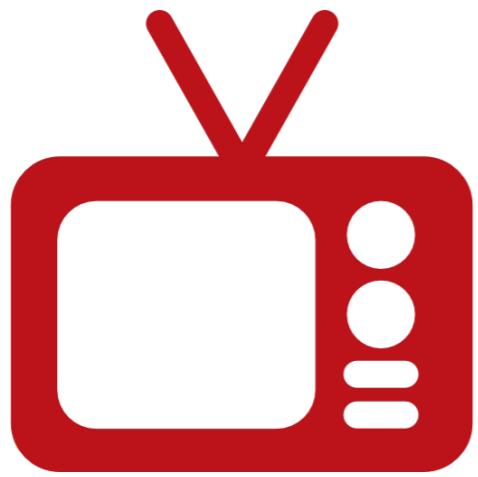


Who was asked?

Students are not always the best subjects

Should we even ask?

People lie and misjudge their actions routinely



How much TV do people watch?

**7 hours
per week**

Self-report

**5 hours
per day**

Nielsen

Daubert standard

1. Whether the scientific theory can be (and has been) tested;
2. Whether the scientific theory has been subjected to peer review and publication;
3. What is the known or potential rate of error of the scientific technique;
4. Whether the theory has received “general acceptance” in the scientific community.

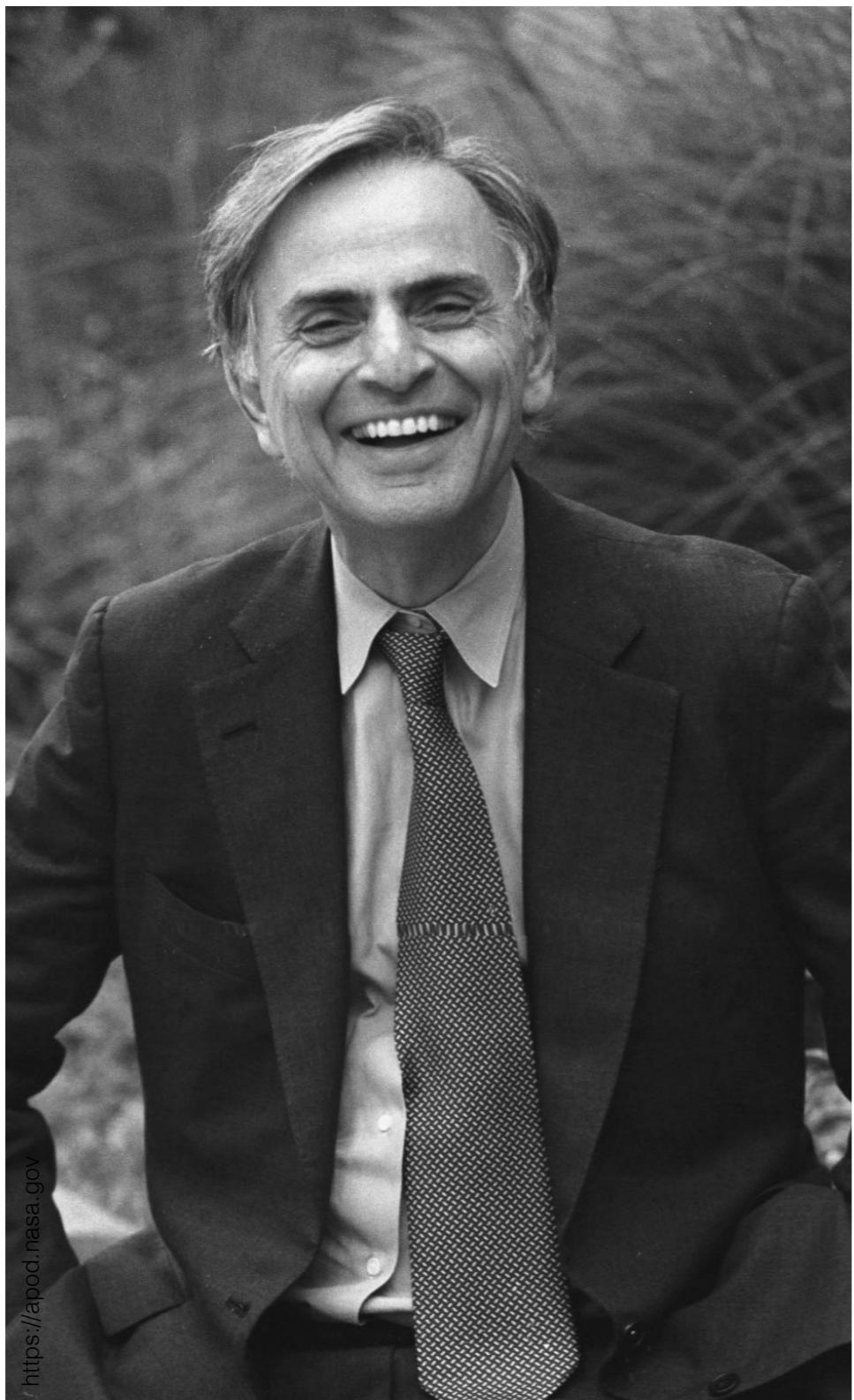
WHAT'S THE LEVEL OF CERTAINTY?

1. Reasonable suspicion
2. Reasonable to believe
3. Probable cause for arrest
4. Some credible evidence
5. Substantial evidence
6. Preponderance of the evidence
7. Clear and convincing evidence
8. Beyond reasonable doubt

To sum things up:

1. Statistical evidence is the most robust
2. But it's not immune from mistakes
3. Try to come up with a measure of certainty

Expert

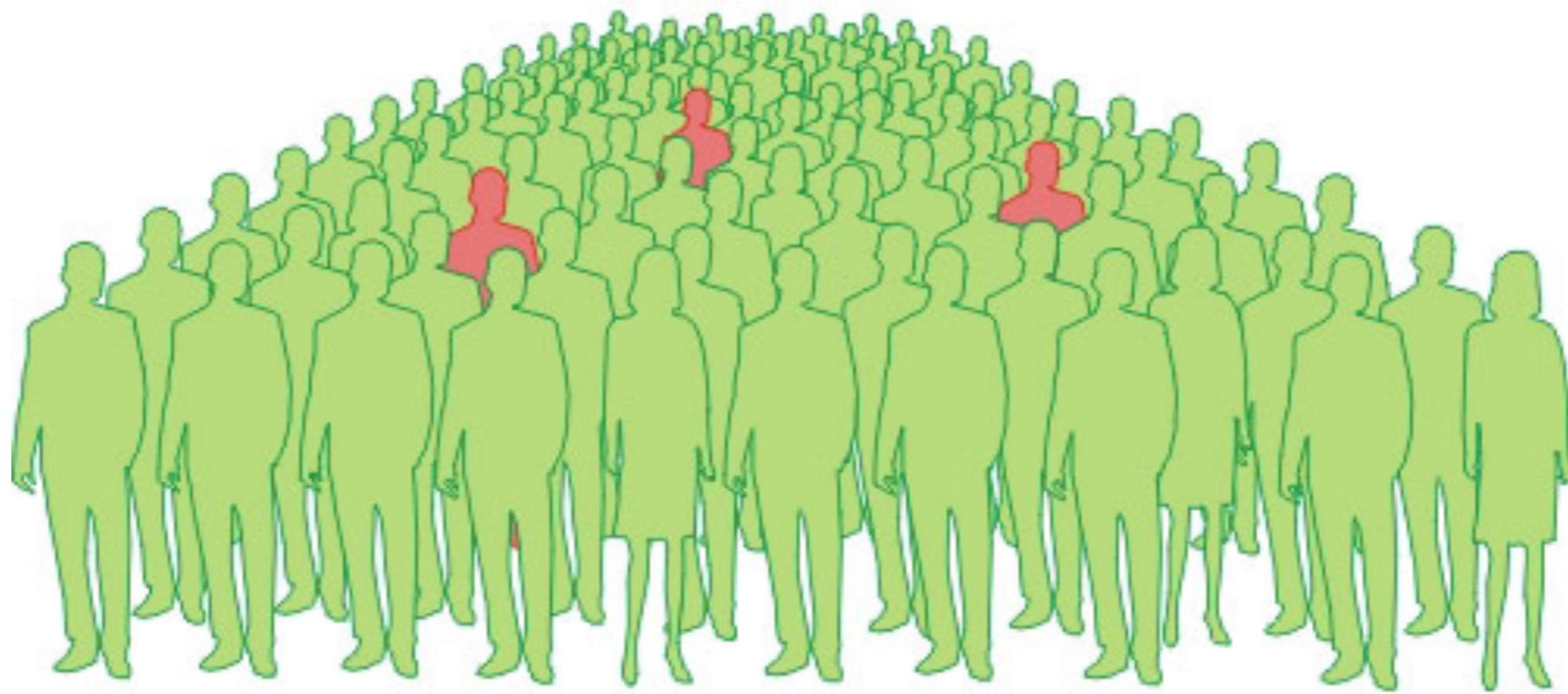


One of the great commandments of science is, "Mistrust arguments from authority." ... Too many such arguments have proved too painfully wrong

Carl Sagan
A great American astronomer

**An expert quote is a
shortcut to statistics**

Or at least it should be



**What's the scientific
consensus?**

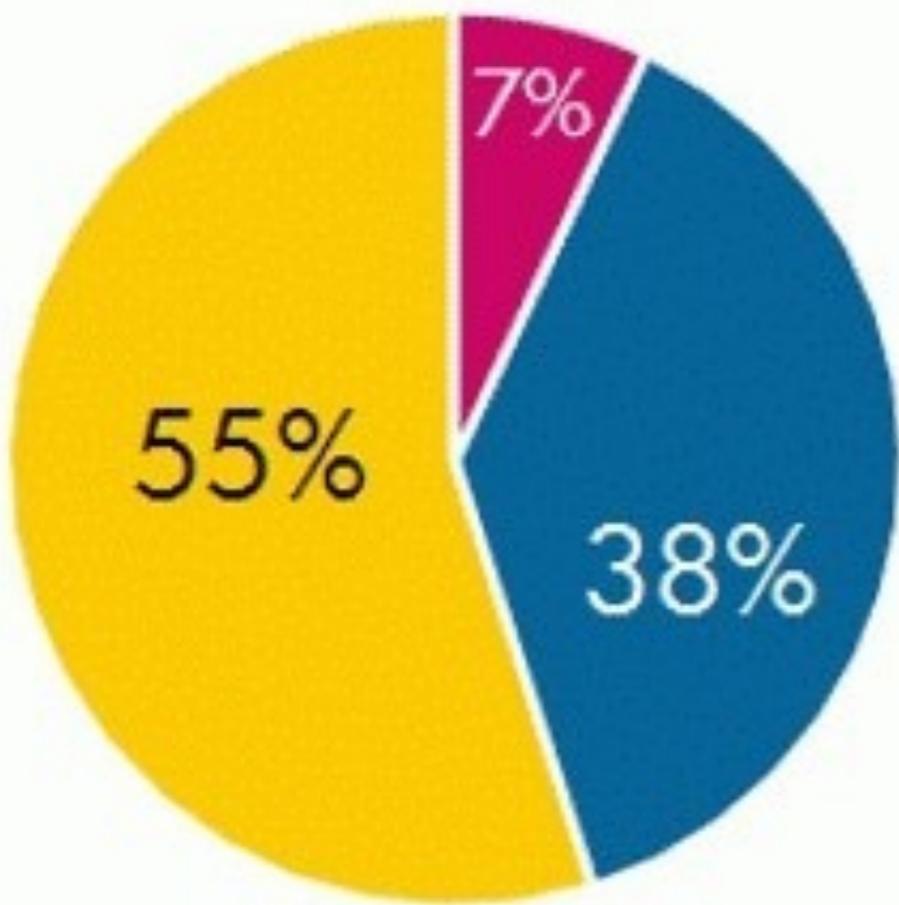
Problems with expert evidence

- ❖ The authority is misquoted
- ❖ The authority is outside his/her area
- ❖ The area of expertise is pretty vague



**FEW
QUESTIONS
TO ASK**

**Is the quote
accurate?**

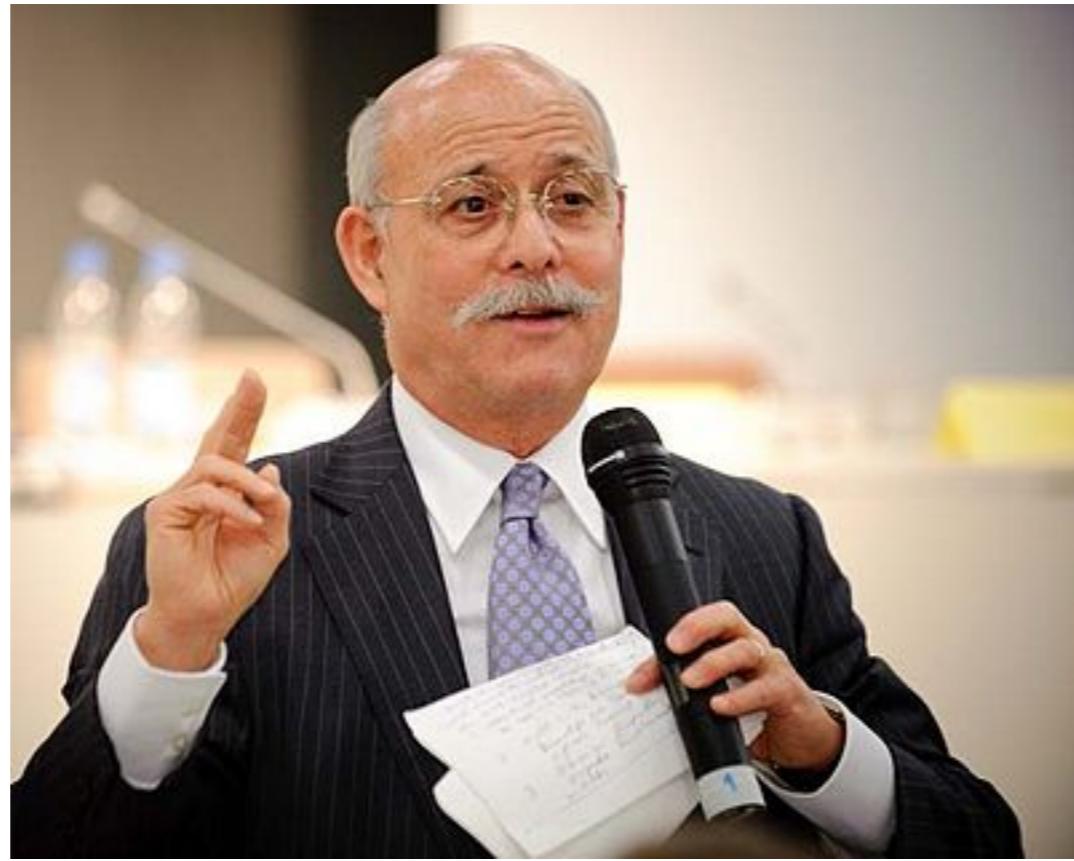


Elements of Personal Communication

- 7% spoken words
- 38% voice, tone
- 55% body language

Source: Professor Albert Mehrabian
University of California Los Angeles

**Is the authority
in his/her area
of expertise?**



Many of the genetically modified foods will be safe, I'm sure. Will most of them be safe? Nobody knows.

JEREMY RIFKIN

*American economic and social theorist,
writer, public speaker and activist*



Scientific and regulatory agencies around the world have repeatedly and consistently found crops and foods improved through biotechnology to be as safe as, if not safer than those derived from any other method of production.

— An open letter signed
by 107 Nobel Laureates

**Is there an area
of expertise?**



Evil is the result of what happens when man does not have God's love present in his heart.

ALBERT EINSTEIN

He never said that.

But it really, really does not matter.



2/28/2016 | ALABAMA

"FIRST THEY IGNORE YOU,
THEN THEY LAUGH AT YOU,
THEN THEY FIGHT YOU,
THEN YOU WIN."

MAHATMA GANDHI

#VoteTrump #SuperTuesday



Donald J. Trump 
@realDonaldTrump

 Follow

#Trump2016 #TrumpInstagram:
instagram.com/p/BCYF4O6hex/

[View image on Twitter](#)

7:16 PM - 29 Feb 2016

**Consequences?
None.**

PHILIP E. TETLOCK

EXPERT
 POLITICAL
 JUDGMENT

How Good Is It? How Can We Know?



**I eat two bananas every
day and that's my recipe
for success and happiness.**

WILLIAM HENRY GATES III

So what if he said that?

Survivorship bias: you can always find improbable successes in a sample large enough

To sum things up:

1. Could be weak or strong depending on person/context
2. The expert should be in his/her area of expertise
3. The area of expertise should be well-defined
4. The quote should be accurate



**Don't have too
many arguments**



Both Meyvis and Janiszewski's (2002) research in advertising and Friederich, Fetherstonhaugh, Casey, and Gallagher's (1996) research in psychology conclude that **adding weak arguments to strong ones weakens overall persuasion**

Andrew Abela

Advanced Presentations by Design

STATISTICS

To prove

EXPERT QUOTES

As a shortcut to statistics

STORIES

To explain and to produce emotional impact

LOGICAL CONCLUSIONS

If you have nothing else