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NE 28 SEA 24 4th :26 :06 2nd & Goal

USA TODAY:

“What on Earth was Seattle Thinking With Worst Play Call in NFL History?”

WASHINGTON POST:

“Worst Play-Call in Super Bowl History’ Will Forever Alter perception of Seahawks, Patriots”

FOXSPORTS.COM:

“Dumbest Call in Super Bowl History Could Be Beginning of the End for Seattle Seahawks”

SEATTLE TIMES:

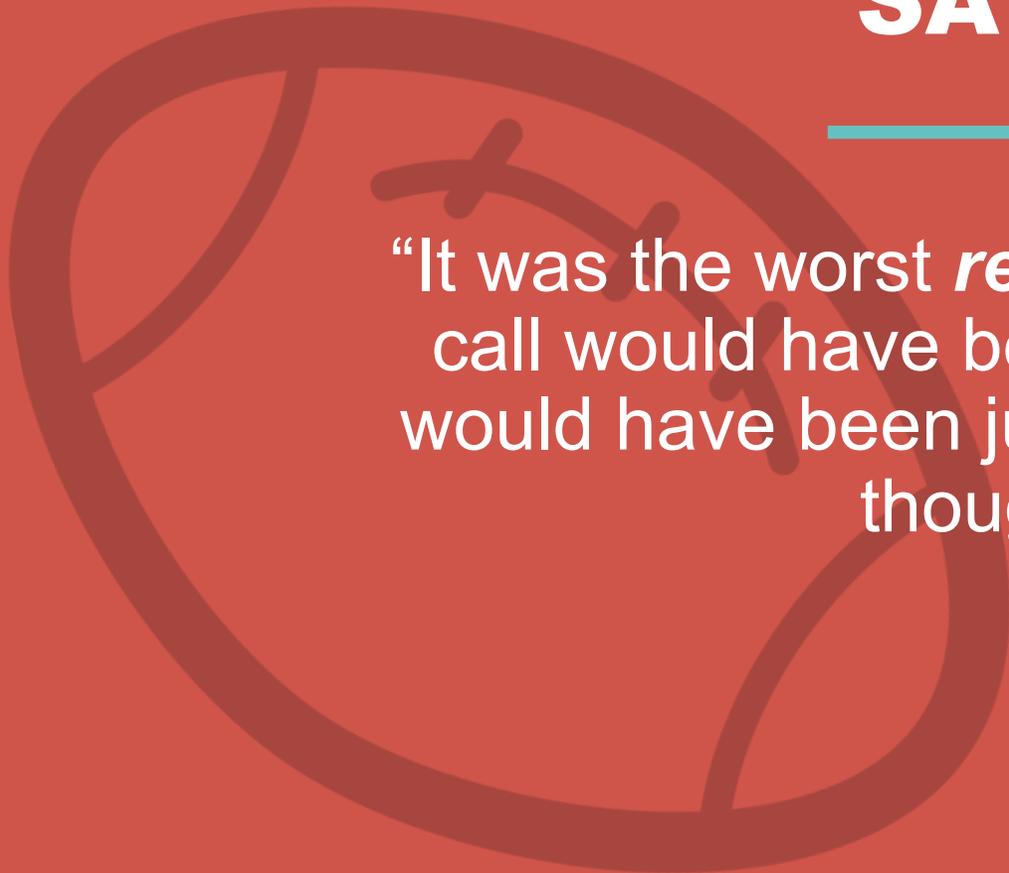
“Seahawks Lost Because of the Worst Call in Super Bowl History”

THE NEW YORKER:

“A Coach’s Terrible Super Bowl Mistake”

HERE'S WHAT PETE CARROLL HAD TO SAY ABOUT IT

“It was the worst *result* of a call ever,” adding, “The call would have been a great one if we catch it. It would have been just fine, and nobody would have thought twice about it.”





PHI 15 NE 12 2nd :38 :19 4th & Goal

RESULTING

Equating the Quality of a Decision
with the Quality of its Outcome

A hand holding three playing cards: Ace of Clubs, Ace of Hearts, and Ace of Spades. The background is dark and slightly blurred, showing a stack of cards.

LIFE DOES NOT FIT NEATLY ON A CHESS BOARD

IT FITS MORE NATURALLY ON A POKER BOARD



Poker is a game of decision making under conditions of
uncertainty over time

(Who is John von Neumann and why should you care?)

**A DECISION IS A BET ON A
PARTICULAR FUTURE
BASED ON OUR BELIEFS**

BELIEF



BET



**FUTURE
FUTURE
FUTURE
FUTURE**



HOW DO WE FORM NEW BELIEFS?

INTUITIVE ORDER:

- We **hear** something
- We **vet** the information, deciding whether it is true or not
- We form a **belief**

REAL PROCESS:

- We **hear** it
- We **believe** it
- Maybe if we have the motivation or time we **vet** it

A close-up photograph of a human eye, looking directly at the camera. The image is heavily stylized with a dark blue, semi-transparent overlay that covers the entire scene. The eye's iris and pupil are visible through the overlay, and the eyelashes are clearly defined. The overall mood is mysterious and contemplative.

SEEING IS BELIEVING

Our abstract belief formation system is built on top of our perceptual belief formation system

WE ARE POOR BELIEF CALIBRATORS

ONCE WE HAVE A BELIEF, WE:

1. Notice and seek out **confirming** evidence
2. We actively work to discredit **disconfirming** evidence
3. Even when we find out the evidence is wrong our beliefs are still affected

MOTIVATED REASONING

Beliefs

**Information
Processing**





**“Still a man hears what he wants to hear and disregards the rest.”
The Boxer | Simon & Garfunkel**



BEING SMART MAKES IT WORSE

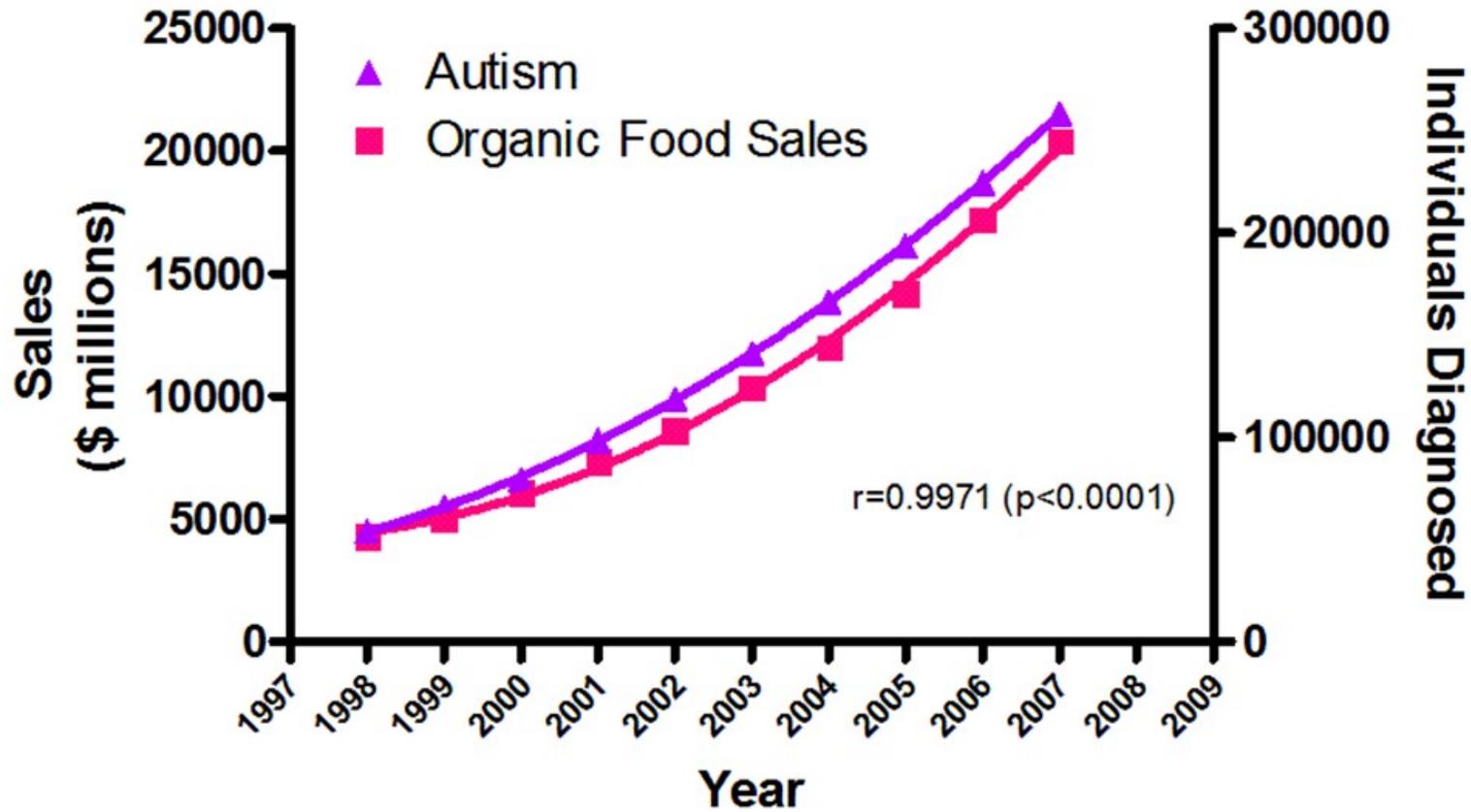
- Data are not Truth: *You need a human being to collect and interpret the data and smart human beings are better at slicing and dicing data to support their beliefs*
- Overconfidence in Intuition: *Being good at something can make you less likely to question your intuition*



HUMANS & ALGORITHMS HAVE DIFFERENT STRENGTHS

- Algorithms are great at interpolation
- Humans are great at generalization
- Algorithms are great at statistical correlation
- Humans are great at common sense and resolving ambiguity

The real cause of increasing autism prevalence?



Sources: Organic Trade Association, 2011 Organic Industry Survey; U.S. Department of Education, Office of Special Education Programs, Data Analysis System (DANS), OMB# 1820-0043: "Children with Disabilities Receiving Special Education Under Part B of the Individuals with Disabilities Education Act"

THE OTHER THOUGHT EXPERIMENT

What if the Seahawks had failed to score by running the expected play: handing the ball off to Marshawn Lynch?

WE ALLOW UNCERTAINTY TO BUBBLE UP AS THE EXPLANATION WHEN WE FEEL THE DECISION QUALITY IS TRANSPARENT

- Consensus decisions
- Oft repeated decisions
- Status quo decisions
- Transparent decisions

OUTCOME QUALITY

D
E
C
I
S
I
O
N

T
Y
P
E

Good

Bad

Transparent

Nice Work

Bad Luck

Opaque

Genius!

Idiot!/Evil!

Nice Work	Bad Luck
Genius!	Idiot!/Evil!

THE DEFENSIVE CROUCH:

Resulting is an innovation killer

- We choose the path that allows for **luck** as the explanation for **failure**
- This drives us toward consensus/status quo choices
- We use data as a shield as opposed to a way to find truth

PART OF THE SOLUTION

- Allowing people to adjust the output of an algorithm by 2% sharply decreases algorithm aversion
- Increasing transparency into how the algorithm is deciding increases acceptance

DO AS I SAY, NOT AS I DO

WE PUT PEOPLE ON THE DEFENSIVE BY:

1. Having the quality of the outcome be the trigger for process dives rather than the unexpectedness of the outcome

- *Unexpected bad outcomes trigger post-mortems*
- *Unexpected good outcomes trigger pats on the back*

1. Only asking if we could have done better
2. NOT asking if we should have done worse

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BET



**FUTURE
FUTURE
FUTURE
FUTURE**



WANNA BET?

How willing would you be to bet on the belief?

- Where and when did you form the belief?
- What evidence do you have for the belief?
- How reliable is the source of the evidence?
- What does the person challenging me to the bet know that I don't?
- What are the reasons the belief might not be true?

“Thoroughly conscious ignorance is the prelude to every real advance in science.”

— James Clerk Maxwell

$$\vec{\nabla} \cdot \vec{D} = \rho$$

$$\vec{\nabla} \cdot \vec{B} = 0$$

$$\vec{\nabla} \times \vec{H} = \vec{j} + \frac{\partial \vec{D}}{\partial t}$$

$$\vec{\nabla} \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}$$

A black and white portrait of James Clerk Maxwell, showing him from the chest up. He has a full, white beard and is looking slightly to the right. The portrait is set against a dark background.

J. Clerk Maxwell

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