IS IT POSSIBLE? IS IT PLAUSIBLE? BECOME A PROBABILITY DETECTIVE.

Bob Lochel

Hatboro-Horsham High School

Mathcoachblog.com

WHO IS BOB?

26-year classroom veteran

AP Statistics Teacher

AP Statistics Reader and Table Leader

Algebra 1 and Prob/Stat Guy

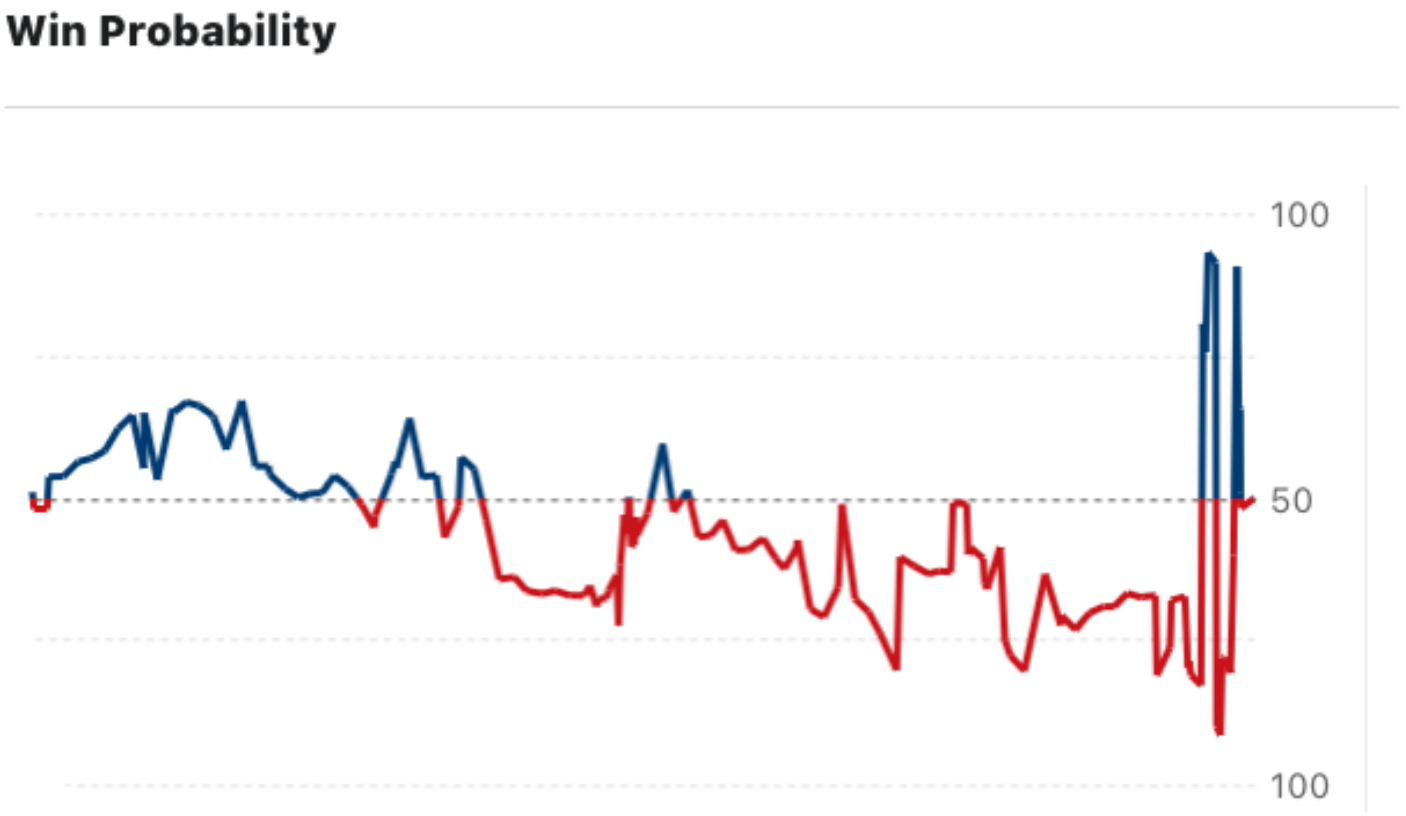
Desmos Guy

Mathcoachblog guy

Suffering Philadelphia sports fan (not involved with the whole Santa v. Snowballs thing…)

“All my elevens and sevens been comin’ up sixes and nines.”
- Bruce Springsteen (Roll of the Dice)

What Do You Notice? What Do You Wonder?



Bob Lochel, @bobloch

The Bills and Chiefs gave us the greatest win probability chart in sports history

Charles Curtis
January 24, 2022 9:38 am ET

Listen to this article

I have seen many a win probability chart in my day.

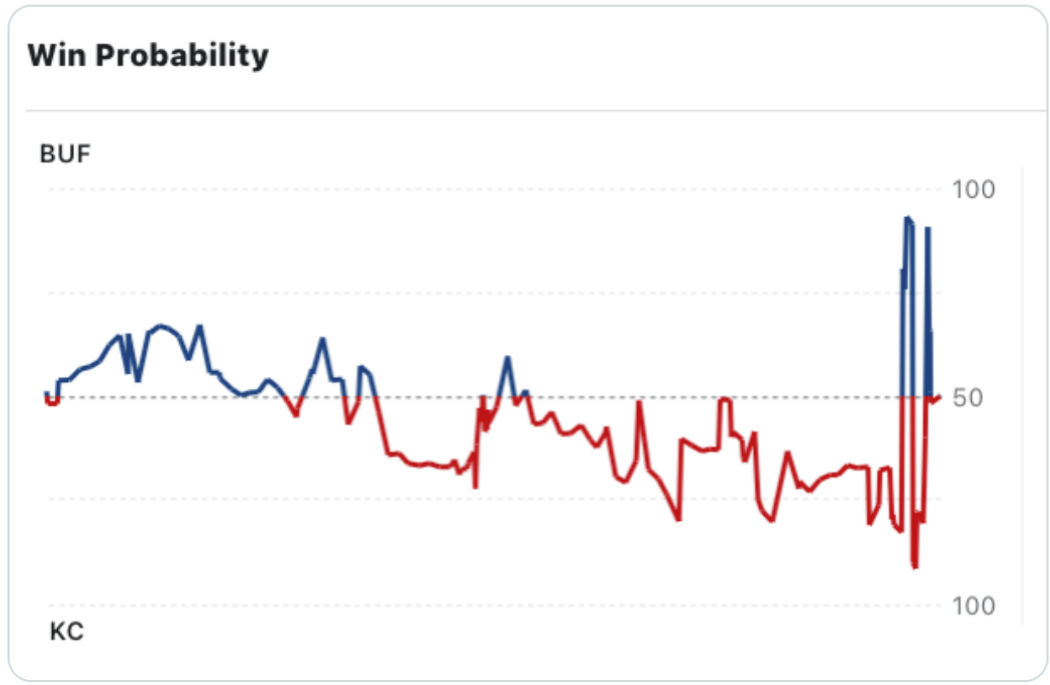
And I have written a lot about them — from what we saw from the **Falcons blowing a lead to the Cowboys** to the **Warriors blowing a 31-point lead** to the 49ers' **Super Bowl collapse against the Chiefs.**

I can safely say that the one produced by an all-time unbelievable playoff game between the Kansas City Chiefs and Buffalo Bills is the all-time greatest chart ever. Even better than the one we saw from the **Dolphins' miracle last-second win over the Patriots**.

It resembles our collective heart rates skyrocketing as we watched **the final two minutes and overtime**. And it is glorious:

SportsCenter
@SportsCenter · Follow

Unreal.



9:51 PM · Jan 23, 2022

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Read 174 replies

Bob Lochel, @bobloch

THE INSPIRATION FOR THIS TALK

What is statistics about?

- Numbers
- Graphs
- Data
- Computing things
- Mean and median

STORYTELLING!

TIME

Holy Craps! How a Gambling Grandma Broke the Record

By Claire Suddath | Friday, May 29, 2009

It sounds like a homework problem out of a high school math book: What is the probability of rolling a pair of dice [redacted] times continuously at a craps table, without throwing a seven?

Borgata

Patricia Demauro

The answer is roughly [redacted] and on May 23, Patricia Demauro, a New Jersey grandmother, beat those odds at Atlantic City's Borgata Hotel Casino and Spa. Demauro's [redacted] roll lucky streak, which lasted [redacted] minutes, broke the world records for the longest craps roll and the most successive dice rolls without "sevening out." According to Stanford University statistics professor Thomas Cover, the chances of that happening are smaller than getting struck by lightning (one in a million), being hit by an errant ball at a baseball game (one in 1.5 million) or winning the lottery (one in 100 million, depending on the game). (Read "When Gambling Becomes Obsessive.")

Bob Lochel, @bobloch

TIME

Holy Craps! How a Gambling Grandma Broke the Record

By Claire Suddath | Friday, May 29, 2009

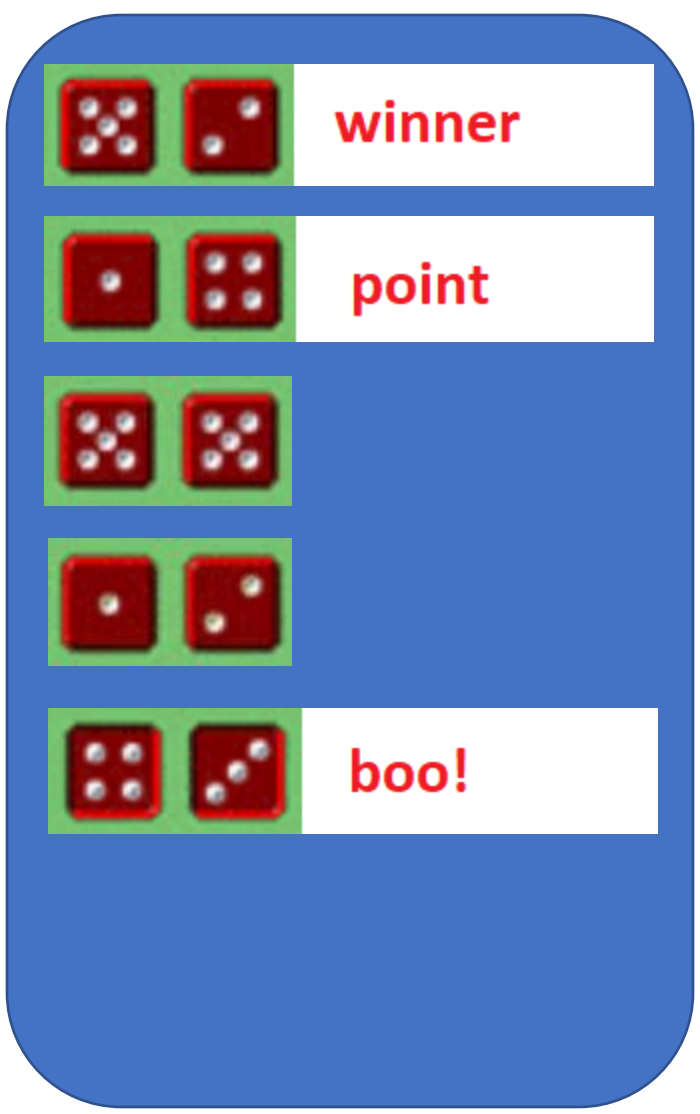
BASIC CRAPS RULES

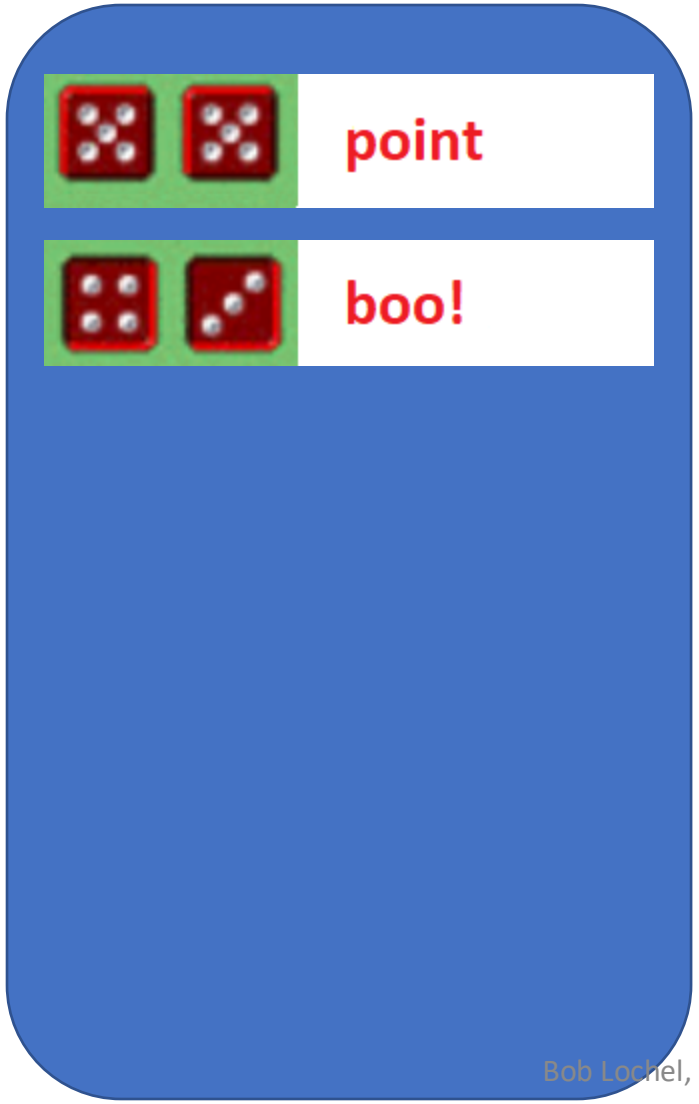
Roll 7 or 11 – win and roll again ☺

Roll 2, 3 or 12 – lose ☹

Roll 4, 5, 6, 8, 9, 10 – this number is your "point". Keep rolling until you make your point ☺, then start over, or until you roll a 7 ("crapping out") ☹

SOME CRAPPY EXAMPLES





TIME

Holy Craps! How a Gambling Grandma Broke the Record

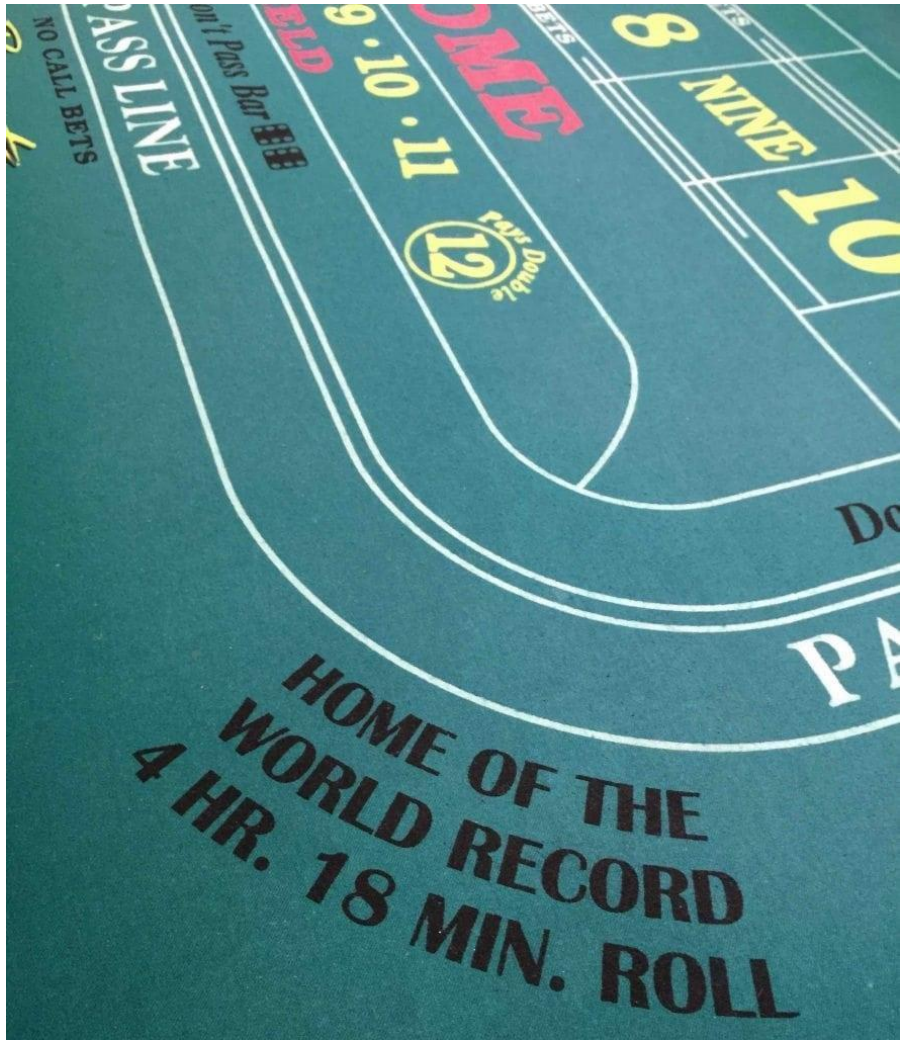
By Claire Suddath | Friday, May 29, 2009

It sounds like a homework problem out of a high school math book: What is the probability of rolling a pair of dice 154 times continuously at a craps table, without throwing a seven?

Borgata

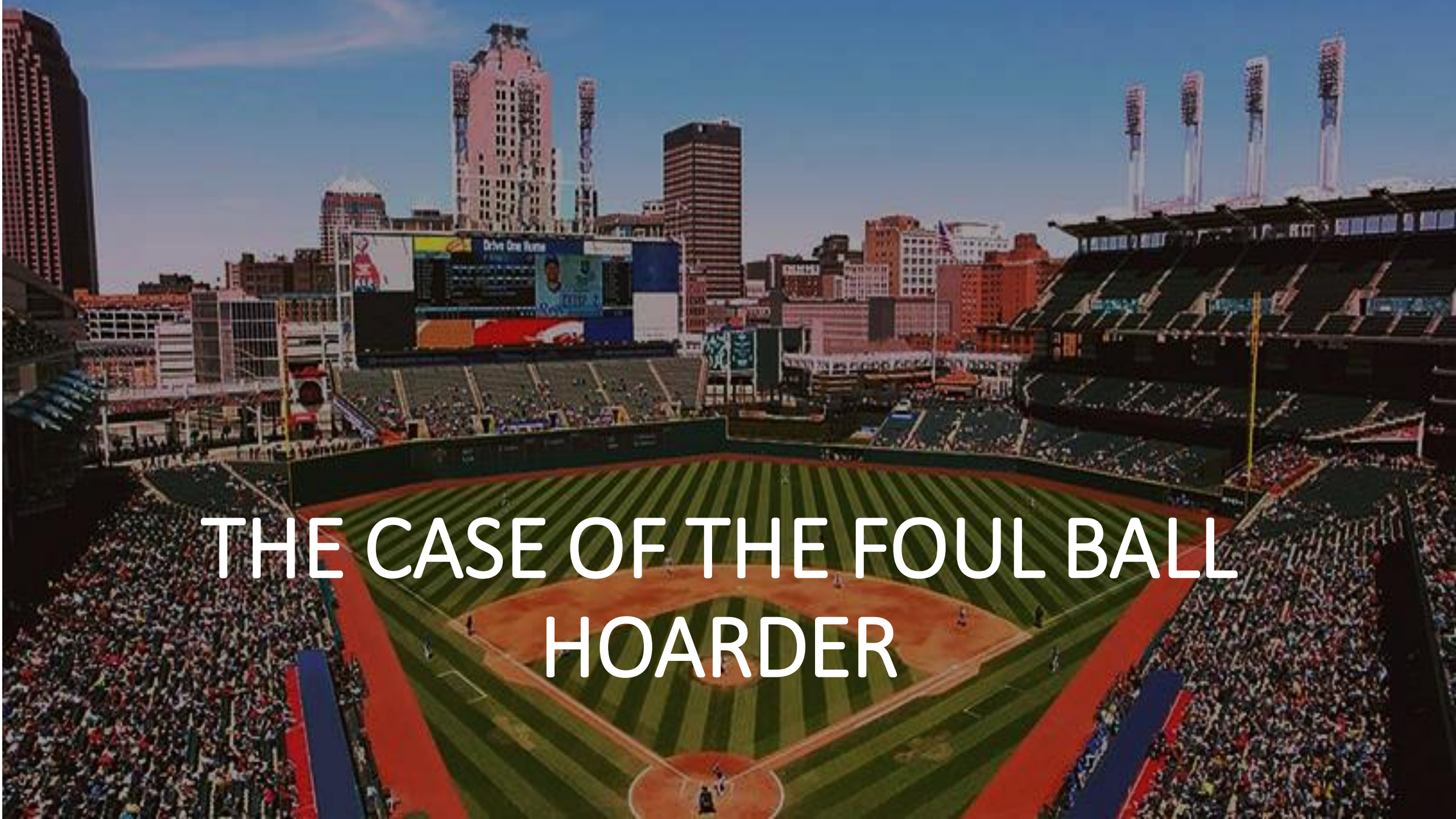
Patricia Demauro

The answer is roughly 1 in 1.56 trillion, and on May 23, Patricia Demauro, a New Jersey grandmother, beat those odds at Atlantic City's Borgata Hotel Casino and Spa. Demauro's 154-roll lucky streak, which lasted four hours and 18 minutes, broke the world records for the longest craps roll and the most successive dice rolls without "sevening out." According to Stanford University statistics professor Thomas Cover, the chances of that happening are smaller than getting struck by lightning (one in a million), being hit by an errant ball at a baseball game (one in 1.5 million) or winning the lottery (one in 100 million, depending on the game). (Read "When Gambling Becomes Obsessive.")



PROBABILITY EVENTS AS MYSTERY STORIES

- What's the claim? Is it possible? Is it plausible?
- What's the evidence?
- What are the clues?
- Is the mathematics correct?
- What are plausible alternate explanations?
- Where was Colonel Mustard? And just where did I leave my wrench?



THE CASE OF THE FOUL BALL HOARDER

Cleveland Indians
@Indians

Follow

Found him: Tribe Season Ticket Holder Greg Niel has caught four foul balls today. Nice work Greg!

Darren Rovell
@darrenrovell

Follow

Odds of catching 4 foul balls in the game today, as an Indians fan did, are roughly 1 in [redacted]

Shout out to Steve Wyborney…the master of "Splat Math"

Bob Lochel, @bobloch

Darren Rovell

@darrenrovell

Follow

Odds of catching 4 foul balls in the game today, as an Indians fan did, are roughly 1 in 1 trillion according to

Bob Lochel, @bobloch

IS “1 IN A TRILLION” REASONABLE?

Major League Historical Totals (1871-present)

There is dispute over whether to include the National Association as a Major League

Years: 149
Games: 219,514
Runs: 1,991,970
At Bats: 15,014,556
Hits: 3,925,424
Home Runs: 304,676
Doubles: 668,062
Triples: 135,054
Stolen Bases: 308,756

Innings Pitched: 3,916,006
Strikeouts: 2,196,228
Walks: 1,385,136
Hit Batsmen: 110,359
Saves: 70,852
Errors: 535,358
Double Plays: 388,839
Players: 10,501
Managers

Data is summed based on data available and may be missing some stats for so

$$\frac{1\,000\,000\,000\,000}{219\,000}$$

$$= 4566210.04566$$

Source: www.baseball-reference.com

Darren Rovell 
@darrenrovell

Follow

Odds of catching 4 foul balls in the game today, as an Indians fan did, are roughly 1 in 1 trillion according to

$$\frac{35}{15432} = 0.002268014515$$

$$0.00226801\ldots \;(\text{ans})^4 = 2.64596027 \times 10^{-11}$$

4	9.2138E-13	6.286E-14	1 in 1.09 Trillion	1 in 15.91 Trillion
5	3.702E-16	1.29E-17	1 in 2.7 Quadrillion	1 in 77.5 Quadrillion

**Uses binomial distribution

@hasmith33
Harrison Smith

Let's check that math!

WHAT ASSUMPTIONS WERE MADE? ARE THEY APPROPRIATE?

$$\frac{35}{15\,432} = 0.002268014515$$

- Foul balls are equally likely for all in attendance.

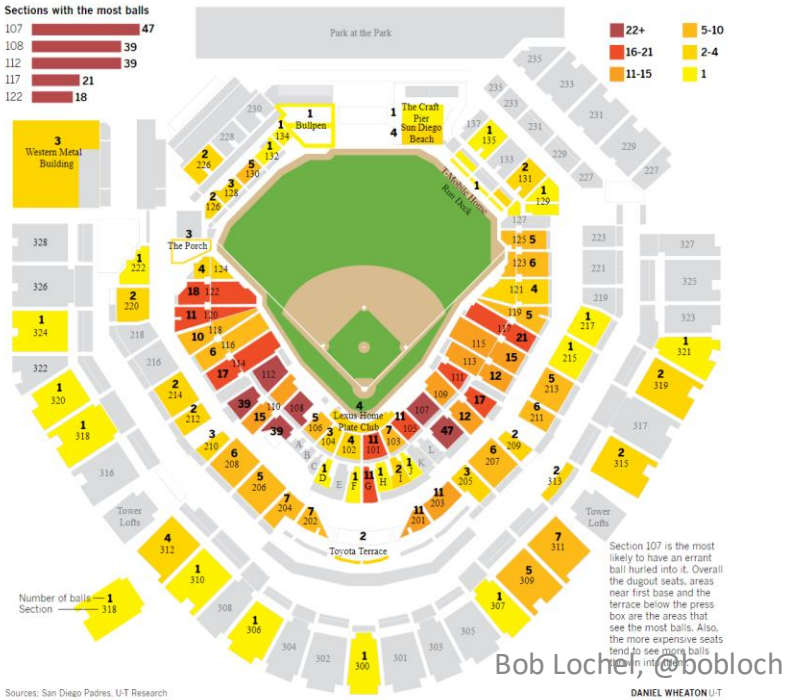
$$\frac{35}{15\,432} = 0.002268014515$$

$$\underbrace{0.00226801\ldots}_{\text{ans}}{}^{4} = 2.64596027 \times 10^{-11}$$

- Foul balls are independent events.

Van Niel's stroke of luck is even more incredible when one takes into consideration the fact that he wasn't sitting in his usual seat. Van Niel took advantage of Progressive Field's season-ticket exchange, which landed him, his brother and his two nephews in Section 160 down the third-base line, according to Lom.
-bleacherreport.com

Source:
https://time.com/foul-ball/

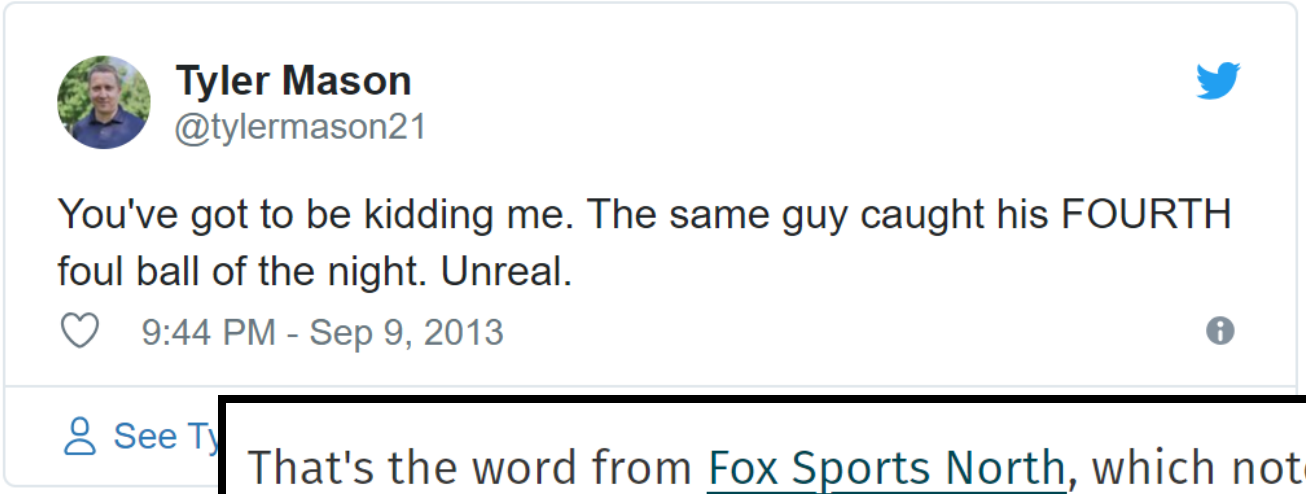


Bob Loche, @bobloch

MEANWHILE....LATER THAT SEASON....

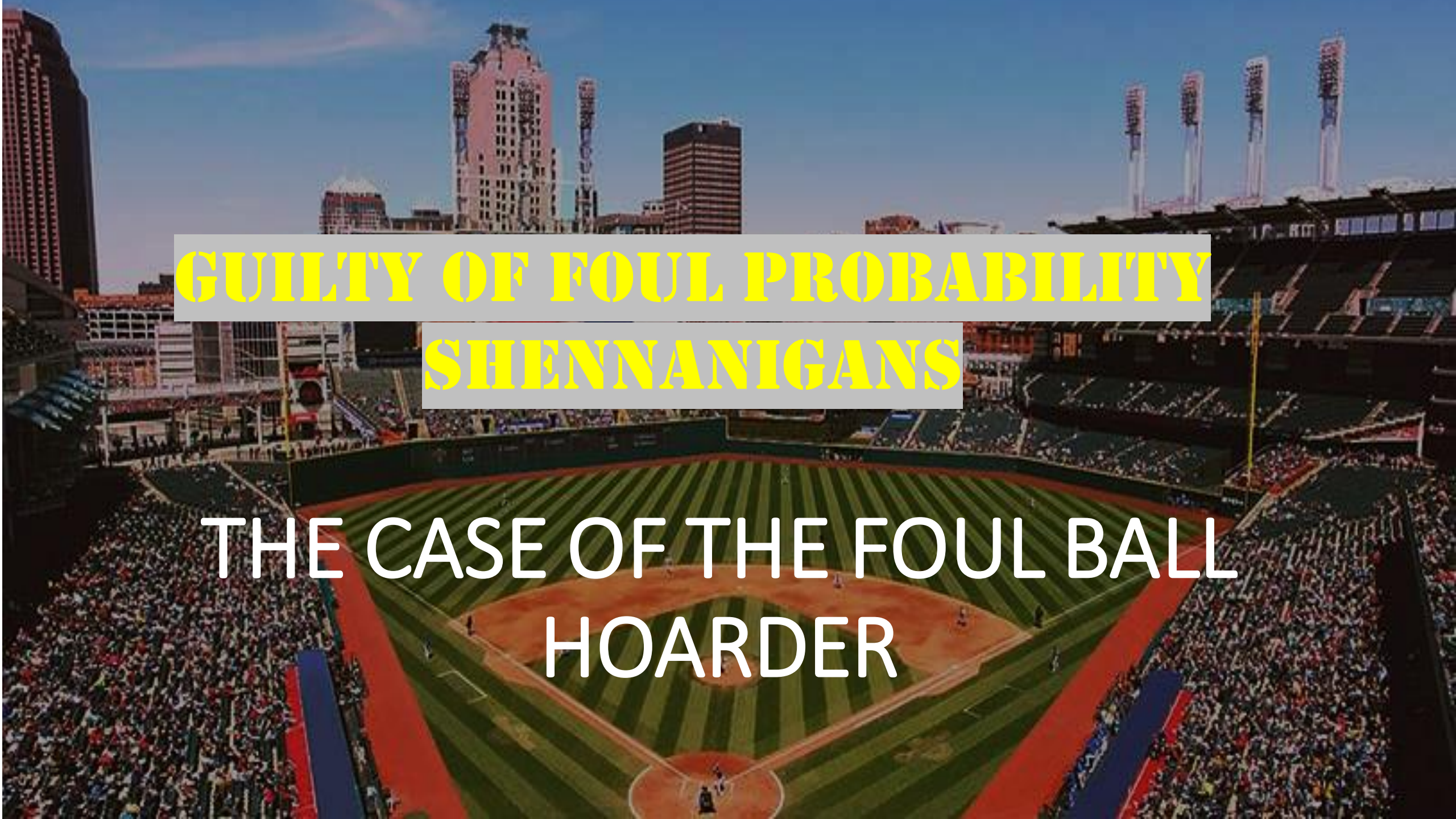
A fan at the Los Angeles Angels at Minnesota Twins game took catching a foul ball to an entirely new level by mastering the art and hauling in a whopping four balls during the night.

Tyler Mason of FOX Sports North gave the details:



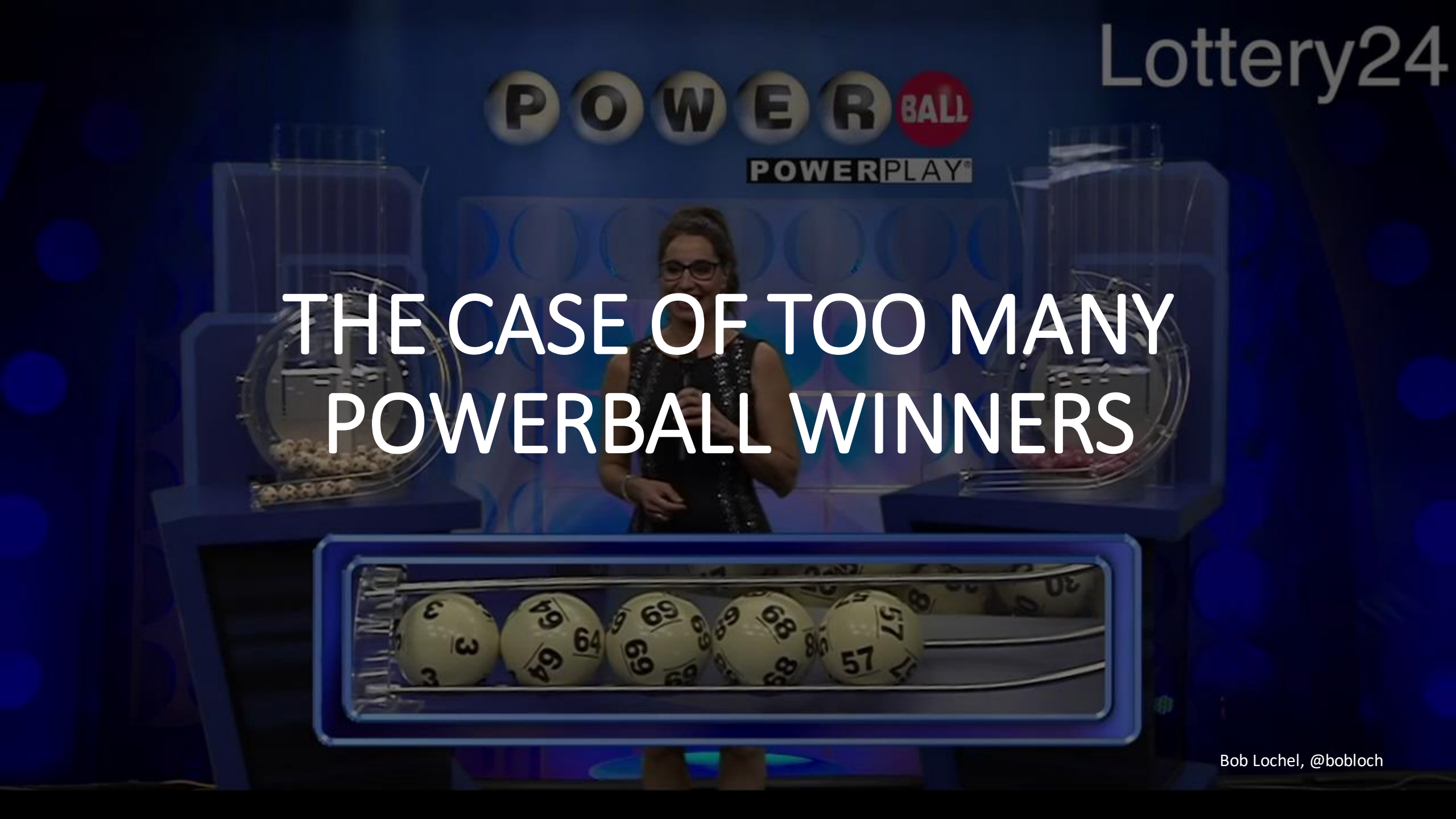
That's the word from Fox Sports North, which notes, "He barely had to move in most cases, too, as the foul balls were hit right to him." Lucky duck.

Bob Lochel, @bobloch



GUILTY OF FOUL PROBABILITY SHENNANIGANS

THE CASE OF THE FOUL BALL HOARDER



THE CASE OF TOO MANY POWERBALL WINNERS

Bob Lochel, @bobloch

JUST THE FACTS…

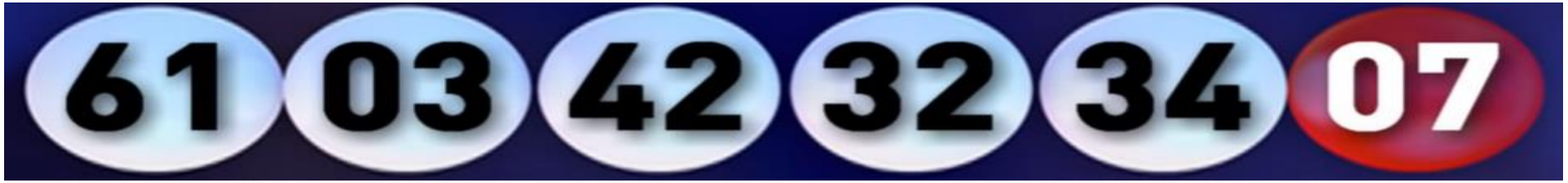
- In Powerball, 5 white numbers from 1-69 are drawn, and one red number from 1-26 is drawn.
- To win the jackpot, a player must match all 5 white numbers and the red number. If there are multiple jackpot winners, the money is split amongst winners.
- Players who select all the white balls correctly, but not the red ball, earn “second prize”, typically $100,000.

JUST THE FACTS…

- In a typical Powerball game, there are about 4-5 second-prize winners.
- In a drawing in May 2005, there were 110 second-chance winners.
- Cost: about $800,000 vs $19,000,000

JUST THE MATH

JUST THE MATH



OF POSSIBLE POWERBALL DRAWINGS:

$$\mathrm{nCr}(69,5) \cdot 26 = 292\,201\,338$$

PROBABILITY OF WINNING JACKPOT:

$$\frac{1}{\mathrm{nCr}(69,5) \cdot 26} = 3.422297813 \times 10^{-9}$$

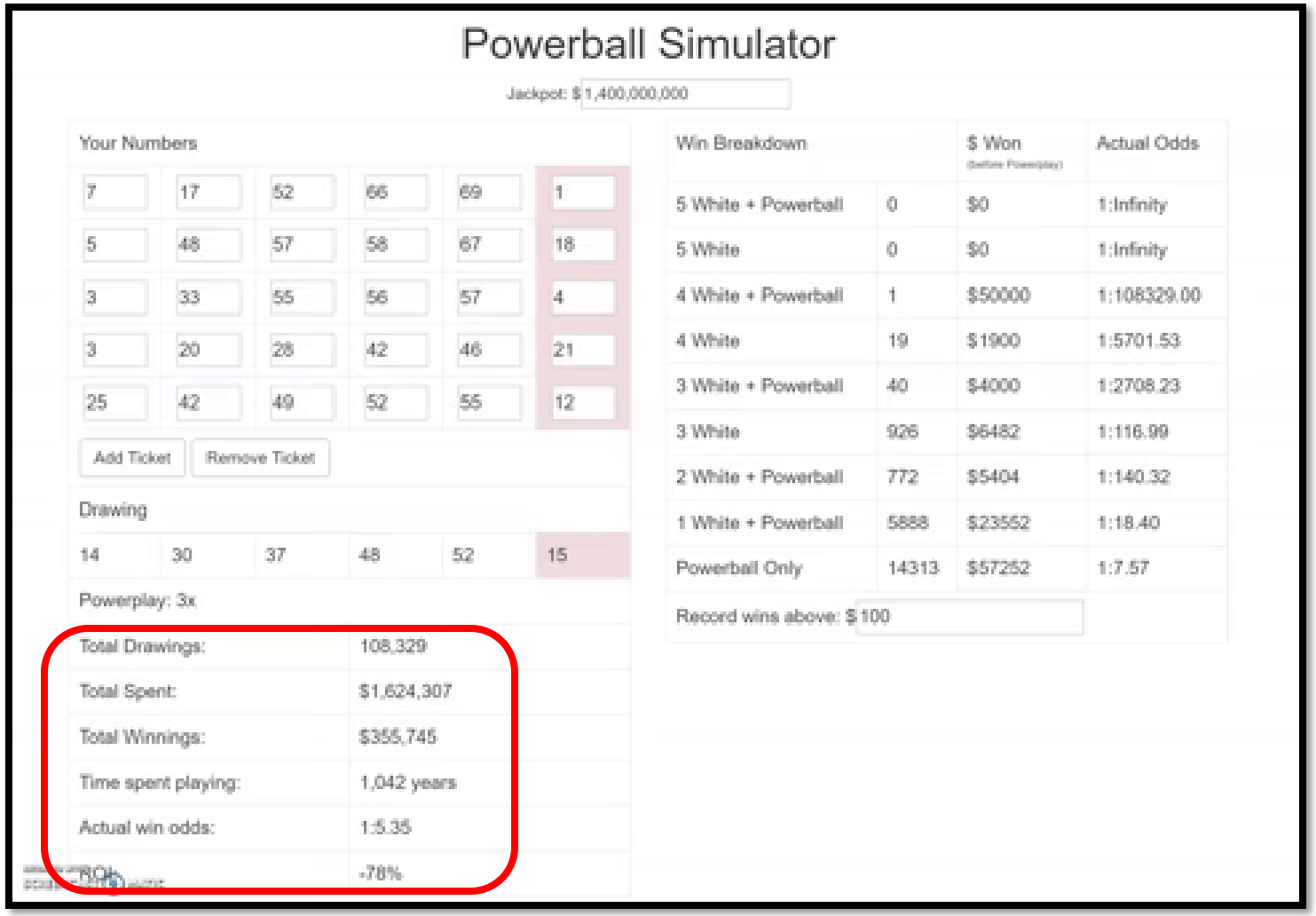
PROBABILITY OF WINNING SECOND PRIZE:

$$\frac{1}{\mathrm{nCr}(69,5)} \cdot \left(\frac{25}{26}\right) = 8.5557445326 \times 10^{-8}$$

Bob Lochel, @bobloch

SIMULATOR:

http://www.adamlamers.com/lottery_simulator



Bob Lochel, @bobloch

Bob Lochel
@bobloch

Class today is obsessed with this Powelball simluator: adamlamers.com/lottery_simula…
One student actually hits the jackpot....a cry of "I'm so good at gambling!" is heard.
Sorry @hhcoralreef....you may want to have a convo with your son today.

9:25 AM · Jan 3, 2018 · Twitter Web Client

Bob Lochel, @bobloch

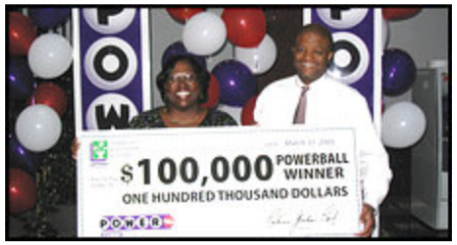
JUST THE FACTS…

- Lottery officials tracked down winners, spread out in 26 states.
- "We expected four or five and ended up with 110," Chuck Strutt, executive director of the Multi-State Lottery Association, said Wednesday. "That's well beyond the realm of normal possibilities."

Fortune Cookie Has Got Their Numbers

By Michelle Garcia
Special to The Washington Post
Thursday, May 12, 2005

NEW YORK, May 11 -- "All the preparation you've done will finally be paying off," read the fortune in Jacquelyn W. Garrett's cookie. The prophecy caught her eye, but it was the numbers stretched across the slip of paper that paid off for her. She played them in the Powerball lottery and won second prize.



Jacquelyn Garrett, with lottery representative Sidney Chambers, was among 110 people with winning tickets. (Tennessee Education Lottery)

TOOLBOX

She was not alone -- an additional 109 people used the

Is it possible?
Is it plausible?
Are there reasonable alternative explanations?

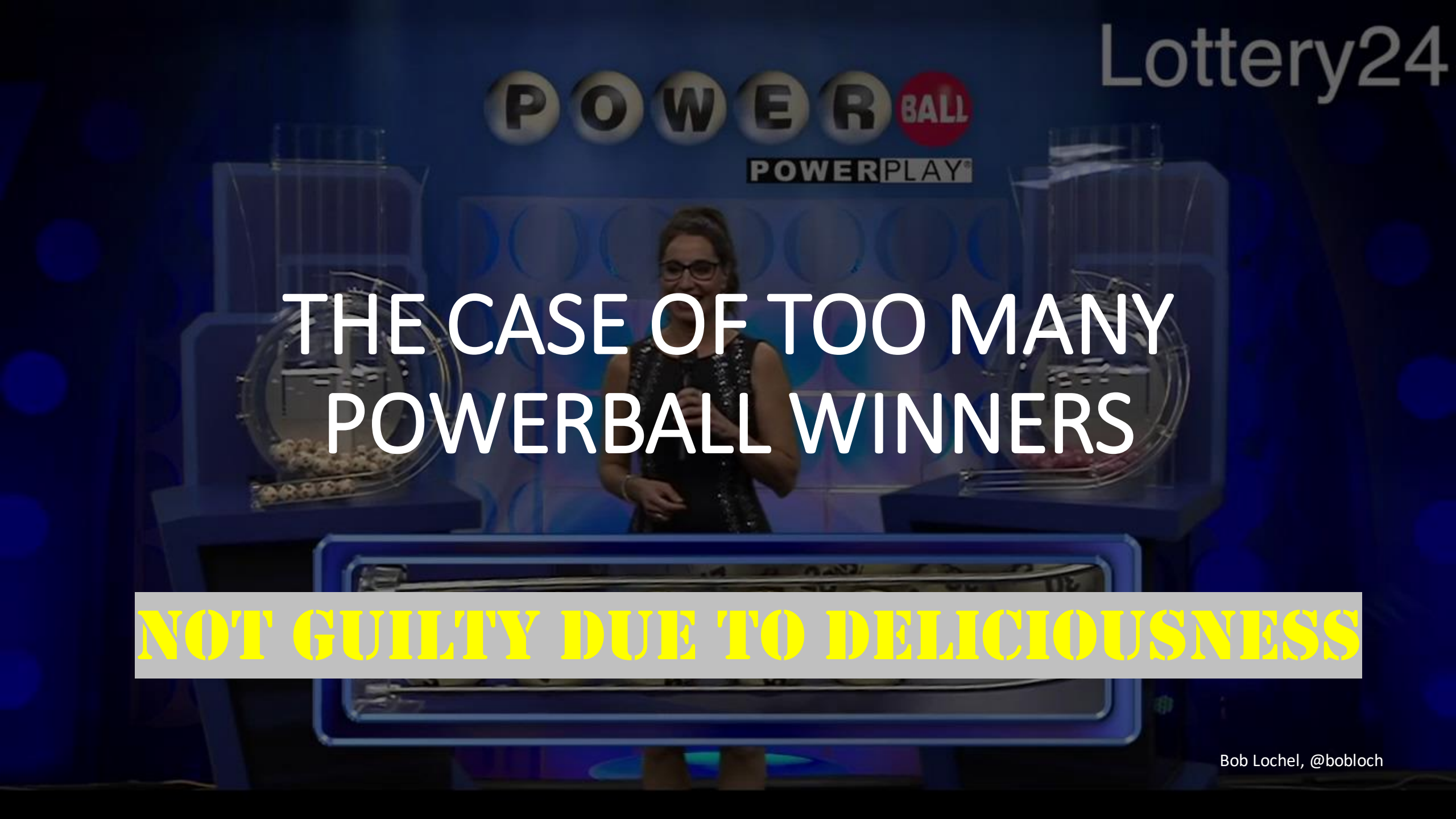
Lottery officials followed the fortune cookie trail, locating the distributor and then narrowing down the cookie makers to three possibilities. The New York Times on Wednesday identified the fortune cookie factory as Wonton Food, a Queens-based company that cranks out 4 million cookies a day.

Derrick Wong, a sales executive at Wonton Food, said the company started printing lottery numbers on fortunes 10 years ago, to distinguish itself from competitors. Numbers are randomly chosen from a big bowl, lottery style, he said.

If the winners had chosen 42 instead of 40, they would have struck the $25 million jackpot. "It actually would have been better for us," said Strutt, explaining that jackpots are divided among the winners.

Garrett said she got her fortune cookie at her favorite Chinese restaurant in suburban Nashville. "I didn't recognize the numbers would mean anything," said Garrett, a schoolteacher. "I was just interested in the fact that this was something positive to me."

Bob Lochel, @bobloch



THE CASE OF TOO MANY POWERBALL WINNERS

NOT GUILTY DUE TO DELICIOUSNESS

Bob Lochel, @bobloch

THE CASE OF THE BIMODAL ELECTION

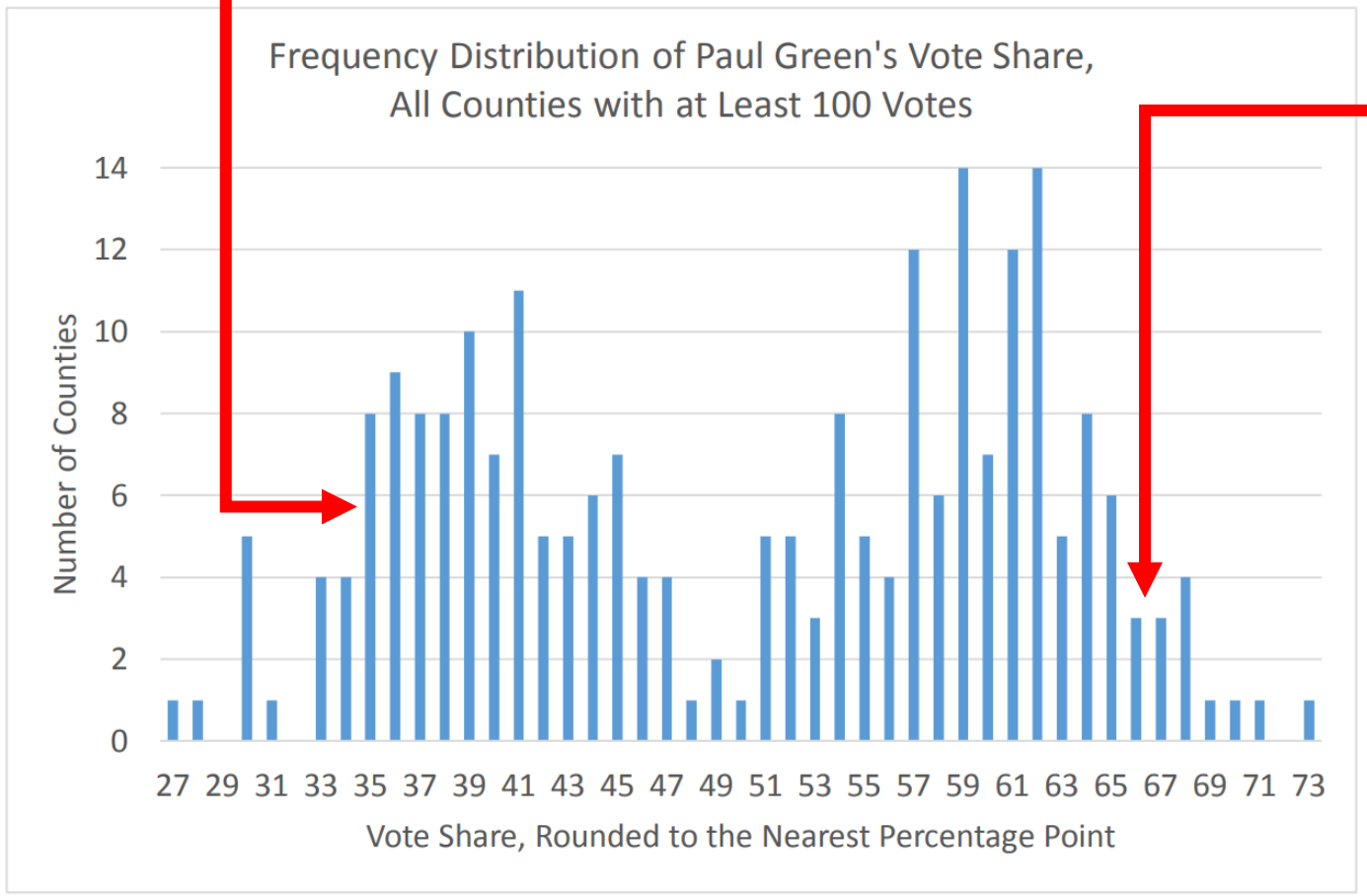
Bob Lochel, @bobloch

JUST THE FACTS…

- 2016 Texas state Supreme Court primary election between Paul Green and Rick Green.
- 233 counties in Texas voted and the percentage vote for each candidate per county was tabulated.

Figure 2. Results Portfolio for the March 1, 2016 Republican Primary for Position 5 on the Texas Supreme Court, between Paul Green and Rick Green.

(a) Histogram of Vote Shares across Counties



Paul Green: 35%
Rick Green 65%

Paul Green: 67%
Rick Green 33%

VOTE SHARE FOR PAUL GREEN, PER COUNTY.
Describe what you observe.
Could random chance explain these results?
What plausible alternate explanations exist?

Source: Philadelphia Inquirer

Ballot for the 2017 Democratic primary for Common Pleas Court

JUDGE OF THE COURT OF COMMON PLEAS

(Vote for not more than 9)

Juez de la Corte de Primeras Instancias

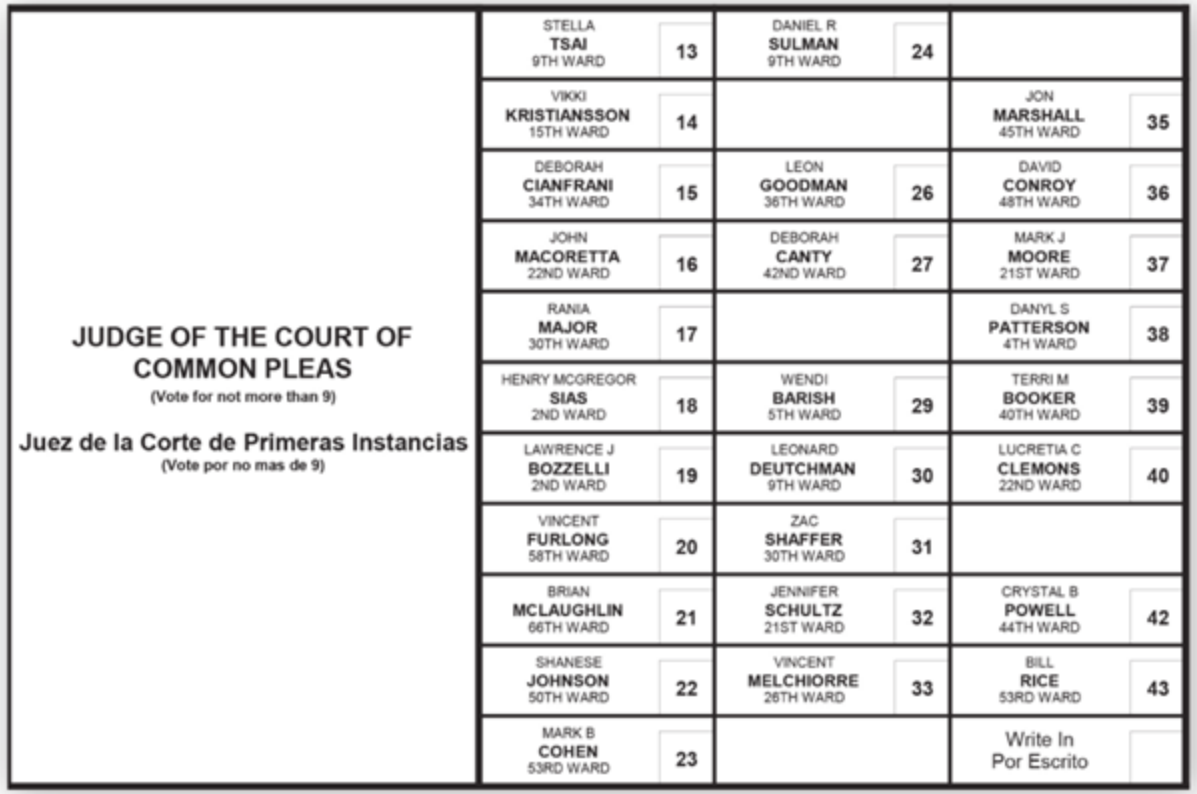
(Vote por no mas de 9)

STELLA **TSAI** 9TH WARD 13	DANIEL R **SULMAN** 9TH WARD 24	
VIKKI **KRISTIANSSON** 15TH WARD 14		JON **MARSHALL** 45TH WARD 35
DEBORAH **CIANFRANI** 34TH WARD 15	LEON **GOODMAN** 36TH WARD 26	DAVID **CONROY** 48TH WARD 36
JOHN **MACORETTA** 22ND WARD 16	DEBORAH **CANTY** 42ND WARD 27	MARK J **MOORE** 21ST WARD 37
RANIA **MAJOR** 30TH WARD 17		DANYL S **PATTERSON** 4TH WARD 38
HENRY MCGREGOR **SIAS** 2ND WARD 18	WENDI **BARISH** 5TH WARD 29	TERRI M **BOOKER** 40TH WARD 39
LAWRENCE J **BOZZELLI** 2ND WARD 19	LEONARD **DEUTCHMAN** 9TH WARD 30	LUCRETIA C **CLEMONS** 22ND WARD 40
VINCENT **FURLONG** 58TH WARD 20	ZAC **SHAFFER** 30TH WARD 31	
BRIAN **MCLAUGHLIN** 66TH WARD 21	JENNIFER **SCHULTZ** 21ST WARD 32	CRYSTAL B **POWELL** 44TH WARD 42
SHANESE **JOHNSON** 50TH WARD 22	VINCENT **MELCHIORRE** 26TH WARD 33	BILL **RICE** 53RD WARD 43
MARK B **COHEN** 53RD WARD 23		Write In Por Escrito

Bob Lochel, @bobloch

Source: Philadelphia Inquirer

Ballot for the 2017 Democratic primary for Common Pleas Court



JUDGE OF THE COURT OF COMMON PLEAS (Vote for not more than 9) / Juez de la Corte de Primeras Instancias (Vote por no mas de 9)						
	STELLA TSAI 9TH WARD	13	DANIEL R SULMAN 9TH WARD	24		
	VIKKI KRISTIANSSON 15TH WARD	14			JON MARSHALL 45TH WARD	35
	DEBORAH CIANFRANI 34TH WARD	15	LEON GOODMAN 36TH WARD	26	DAVID CONROY 48TH WARD	36
	JOHN MACORETTA 22ND WARD	16	DEBORAH CANTY 42ND WARD	27	MARK J MOORE 21ST WARD	37
	RANIA MAJOR 30TH WARD	17			DANYL S PATTERSON 4TH WARD	38
	HENRY MCGREGOR SIAS 2ND WARD	18	WENDI BARISH 5TH WARD	29	TERRI M BOOKER 40TH WARD	39
	LAWRENCE J BOZZELLI 2ND WARD	19	LEONARD DEUTCHMAN 9TH WARD	30	LUCRETIA C CLEMONS 22ND WARD	40
	VINCENT FURLONG 58TH WARD	20	ZAC SHAFFER 30TH WARD	31		
	BRIAN MCLAUGHLIN 66TH WARD	21	JENNIFER SCHULTZ 21ST WARD	32	CRYSTAL B POWELL 44TH WARD	42
	SHANESE JOHNSON 50TH WARD	22	VINCENT MELCHIORRE 26TH WARD	33	BILL RICE 53RD WARD	43
	MARK B COHEN 53RD WARD	23			Write In Por Escrito	

Percent of the vote arranged by ballot position

7.7% Tsai ✓	4.1% Sulman	
7.6% Kristiansson ✓		0.9% Marshall
5.3% Cianfrani ✓	4.0% Goodman	3.4% Conroy
3.6% Macoretta	4.7% Canty ✓	1.5% Moore
3.7% Major		2.0% Patterson
3.8% Sias	3.9% Barish	1.7% Booker
2.9% Bozzelli	1.5% Deutchman	5.7% Clemons ✓
4.3% Furlong ✓	4.8% Shaffer ✓	
3.2% McLaughlin	4.1% Schultz	3.0% Powell
4.5% Johnson ✓	2.9% Melchiorre	0.7% Rice
4.4% Cohen ✓		

SOURCE: Philadelphia City Commissioners

JOHN DUCHNESKIE / Staff Artist

What do you notice? What do you wonder?
Is there sufficient evidence that ballot position matters?

Bob Lochel, @bobloch

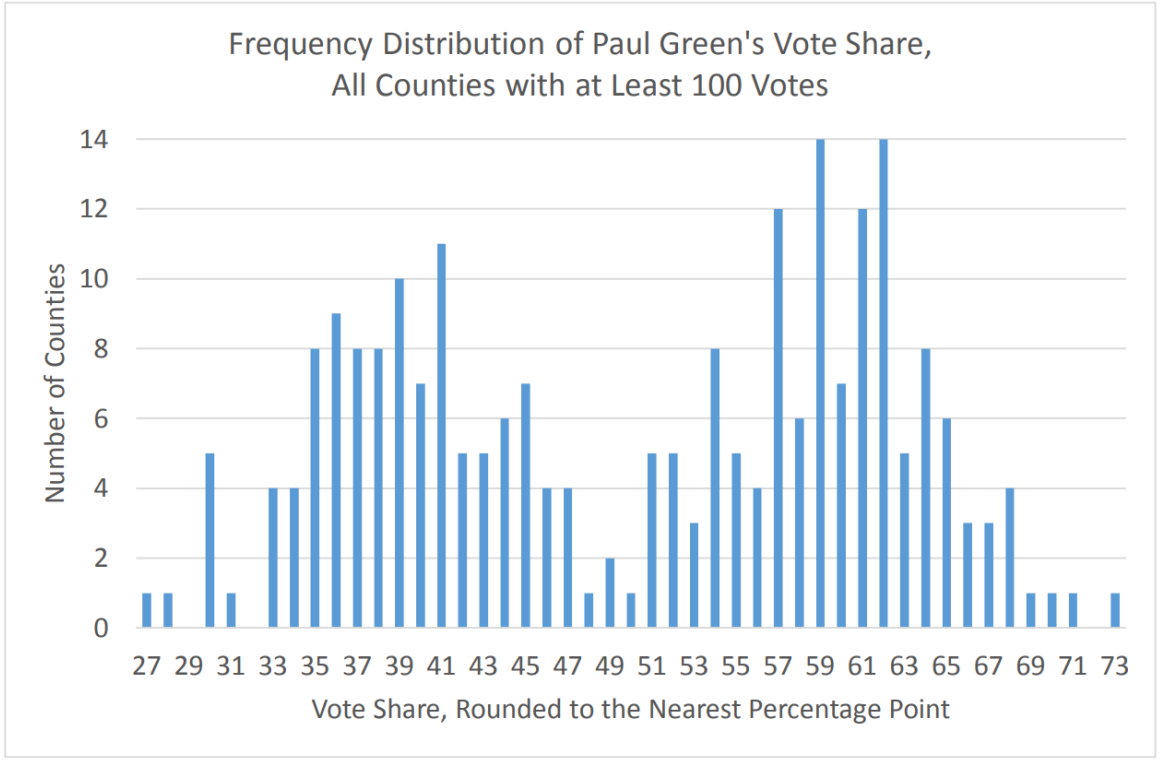
Primary and runoff elections in Texas provide an ideal test of the ballot order hypothesis, because ballot order is randomized within each county and the state offers many counties and contests to analyze. Doing so for all statewide offices contested in the 2014 Democratic and Republican primaries and runoffs yields precise estimates of the ballot order effect across 24 different contests, including several not studied previously. Except for a few high-profile, high-information races, the ballot order effect is large, especially in down-ballot races for judicial positions. There, the empirical results indicate that going from last to first on the ballot raises a candidate's vote share by nearly ten percentage points. The magnitude of this effect is not sensitive to demographic and economic factors.
Darren Grant, Sam Houston State University (May, 2017)

Source:
https://www.shsu.edu/dpg006/ballot%20order.pdf

THE “PERFECT STORM” - GREEN v. GREEN

Figure 2. Results Portfolio for the March 1, 2016 Republican Primary for Position 5 on the Texas Supreme Court, between Paul Green and Rick Green.

(a) Histogram of Vote Shares across Counties



(b) Randomization Tests.

Paul Green is listed first on 121 of 233 ballots, or 51.9%.
Rick Green is listed first on 112 of 233 ballots, or 48.1%.

Bob Lochel, @bobloch

ESTABLISHING BALLOT POSITION IN PHILADELPHIA

Tim Dowling with the Horn & Hardart can | Photo Credit: Holly Otterbein

Bob Lochel, @bobloch

The Man Who Solved ‘Jeopardy!’

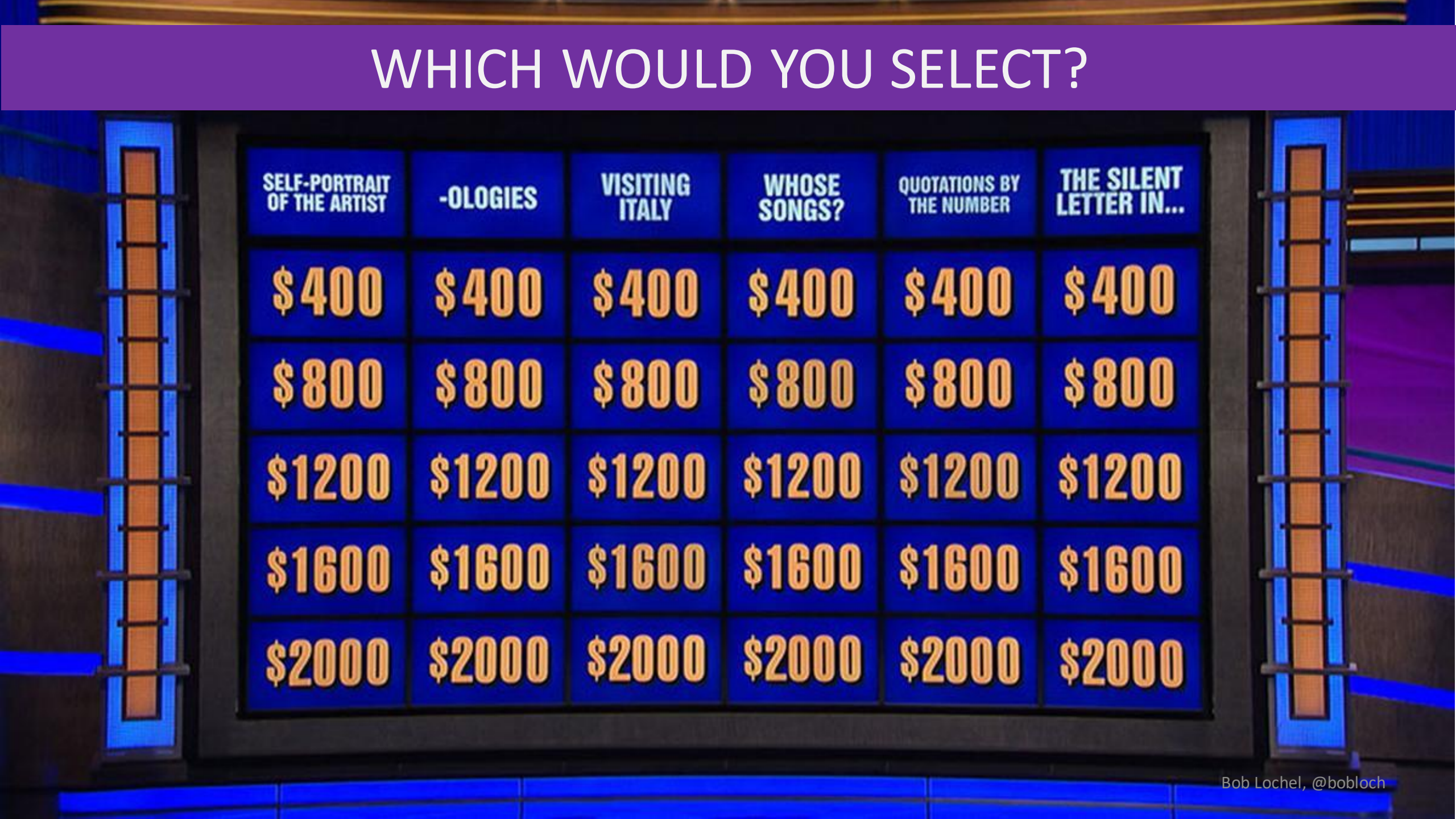
James Holzhauer has taken the game to its logical conclusion.

Why James Holzhauer Is Bad for ‘Jeopardy!’ (Column)

America Has a James Holzhauer Problem and It's Reaching Crisis Proportions

How ‘Jeopardy!’ Champion James Holzhauer Is Ruining the Show

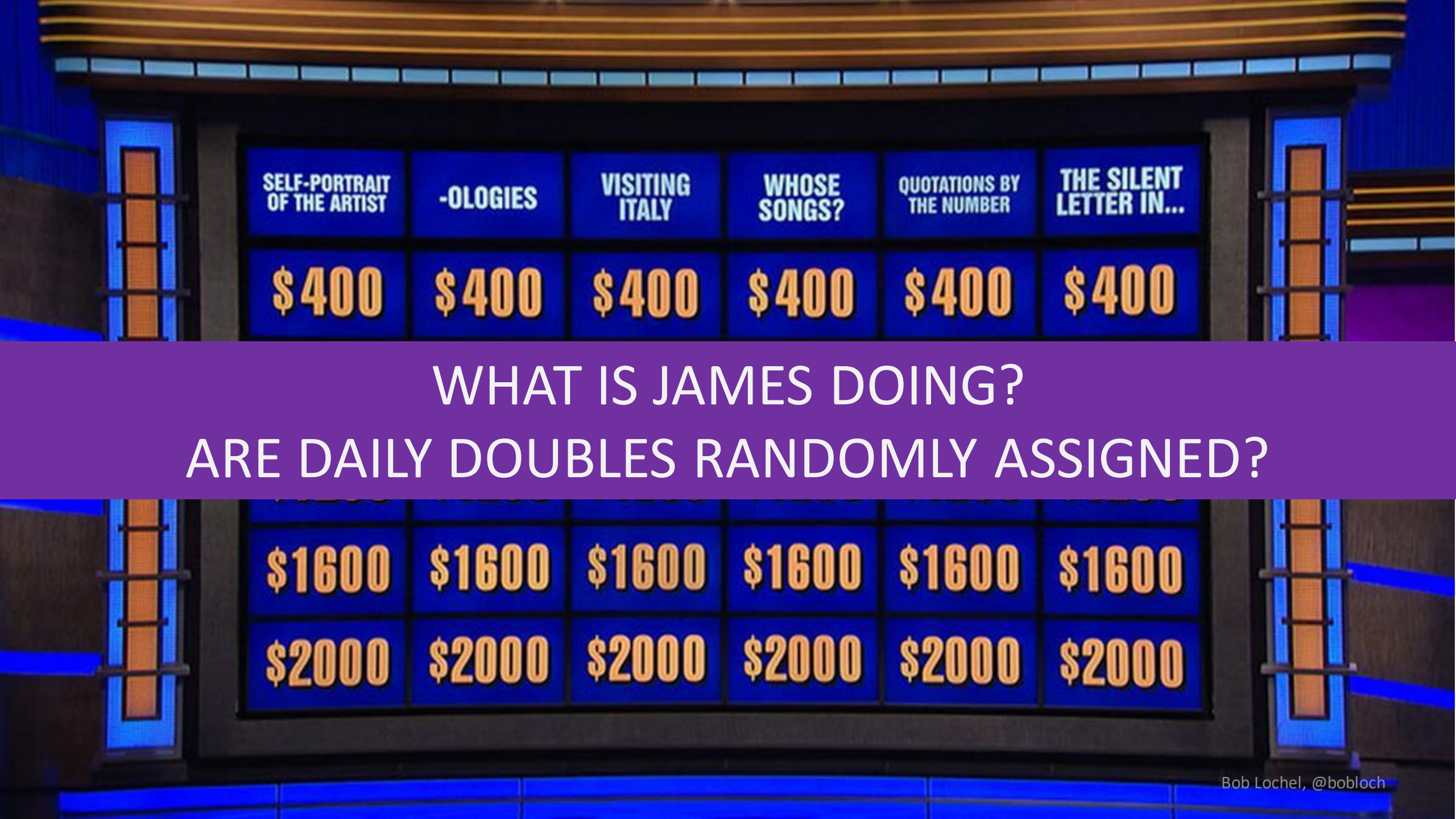
WHICH WOULD YOU SELECT?



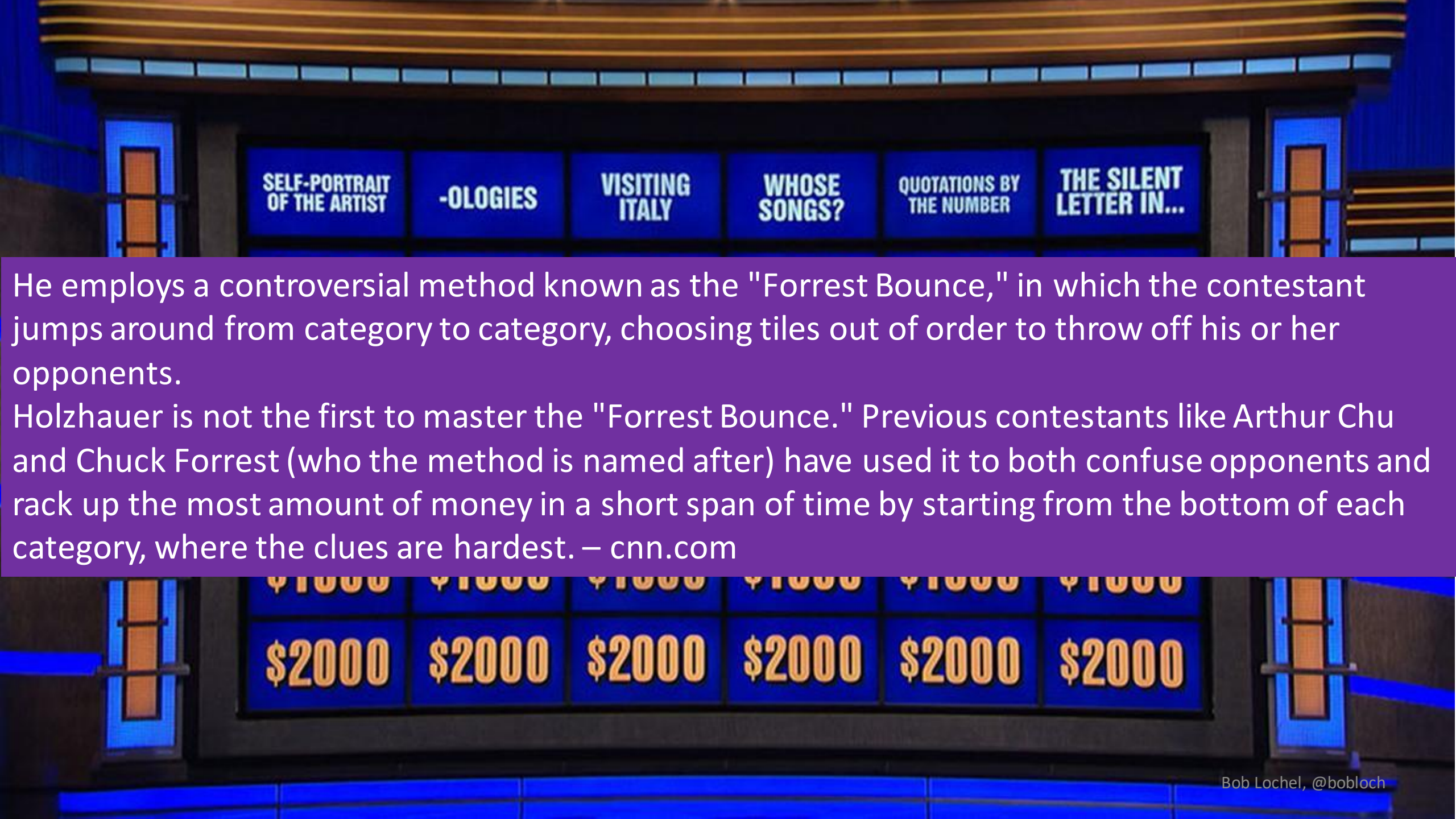
Bob Lochel, @bobloch

Bob Lochel, @bobloch


SELF-PORTRAIT OF THE ARTIST
-OLOGIES
VISITING ITALY
WHOSE SONGS?
QUOTATIONS BY THE NUMBER
THE SILENT LETTER IN...
$400 $400 $400 $400 $400 $400
$800 $800 $800 $800 $800 $800
$1200 $1200 $1200 $1200 $1200 $1200
$1600 $1600 $1600 $1600 $1600 $1600
$2000 $2000 $2000 $2000 $2000 $2000
Bob Lochel, @bobloch



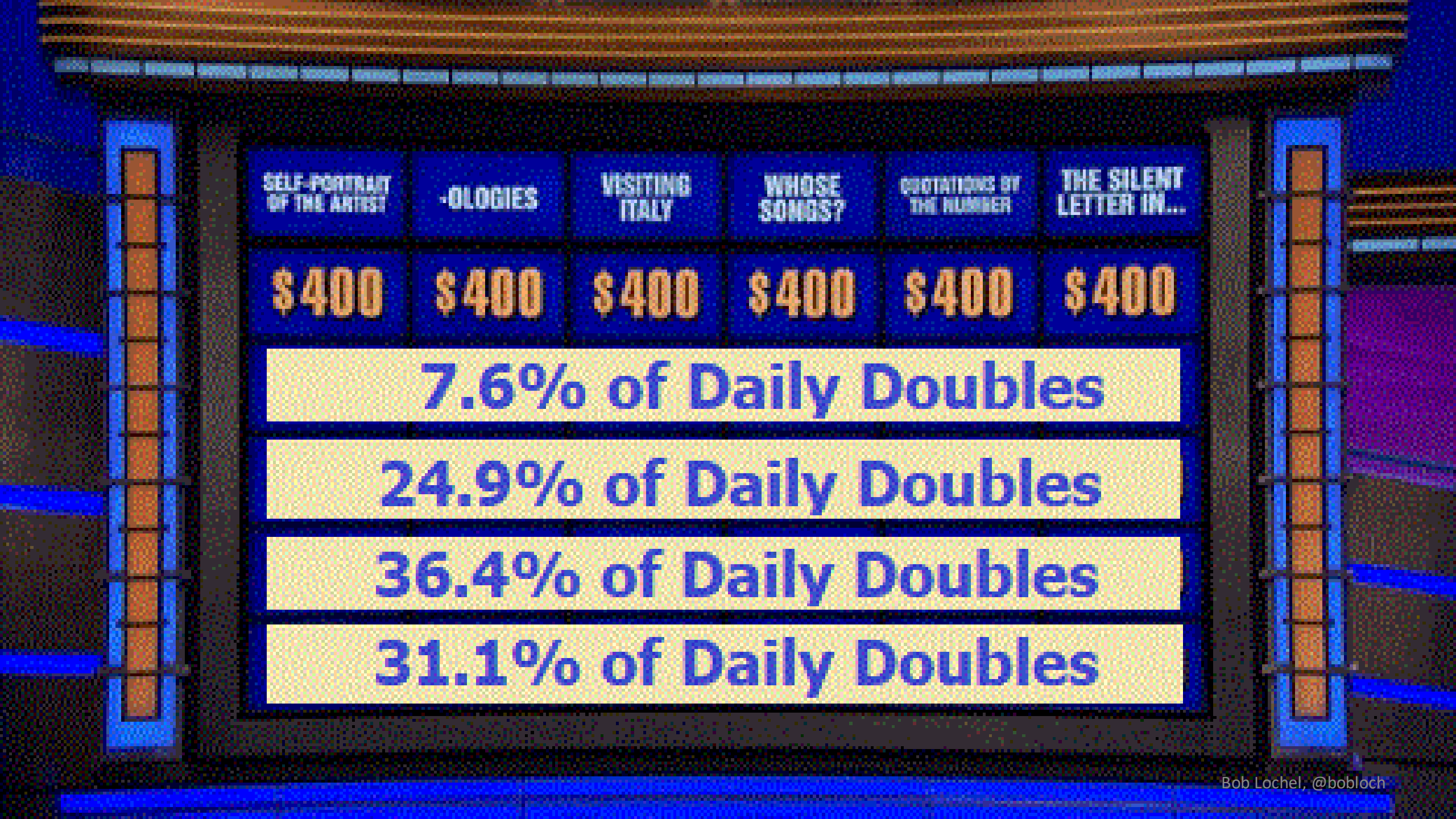
WHAT IS JAMES DOING?
ARE DAILY DOUBLES RANDOMLY ASSIGNED?



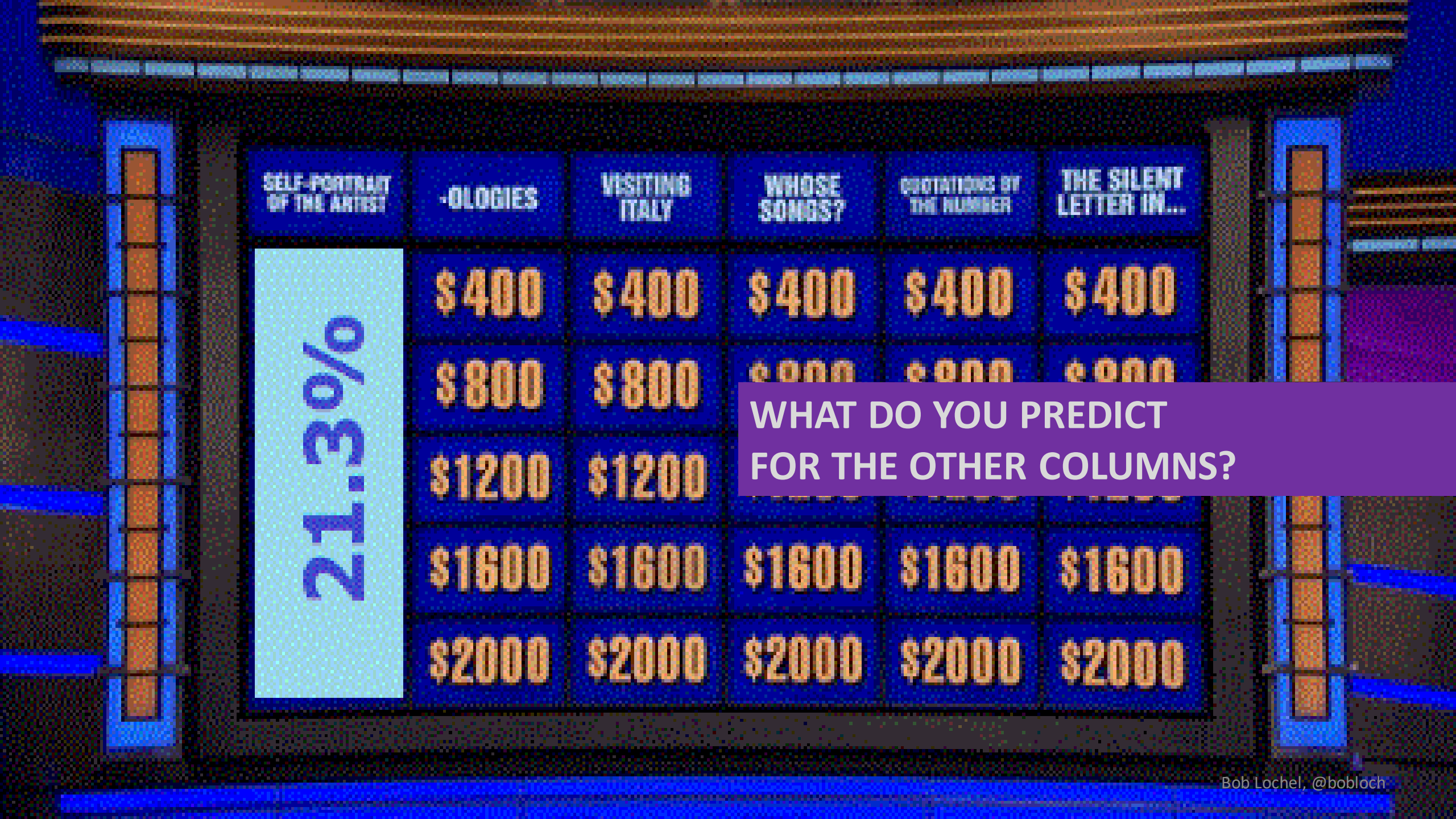
He employs a controversial method known as the "Forrest Bounce," in which the contestant jumps around from category to category, choosing tiles out of order to throw off his or her opponents.

Holzhauer is not the first to master the "Forrest Bounce." Previous contestants like Arthur Chu and Chuck Forrest (who the method is named after) have used it to both confuse opponents and rack up the most amount of money in a short span of time by starting from the bottom of each category, where the clues are hardest. – cnn.com

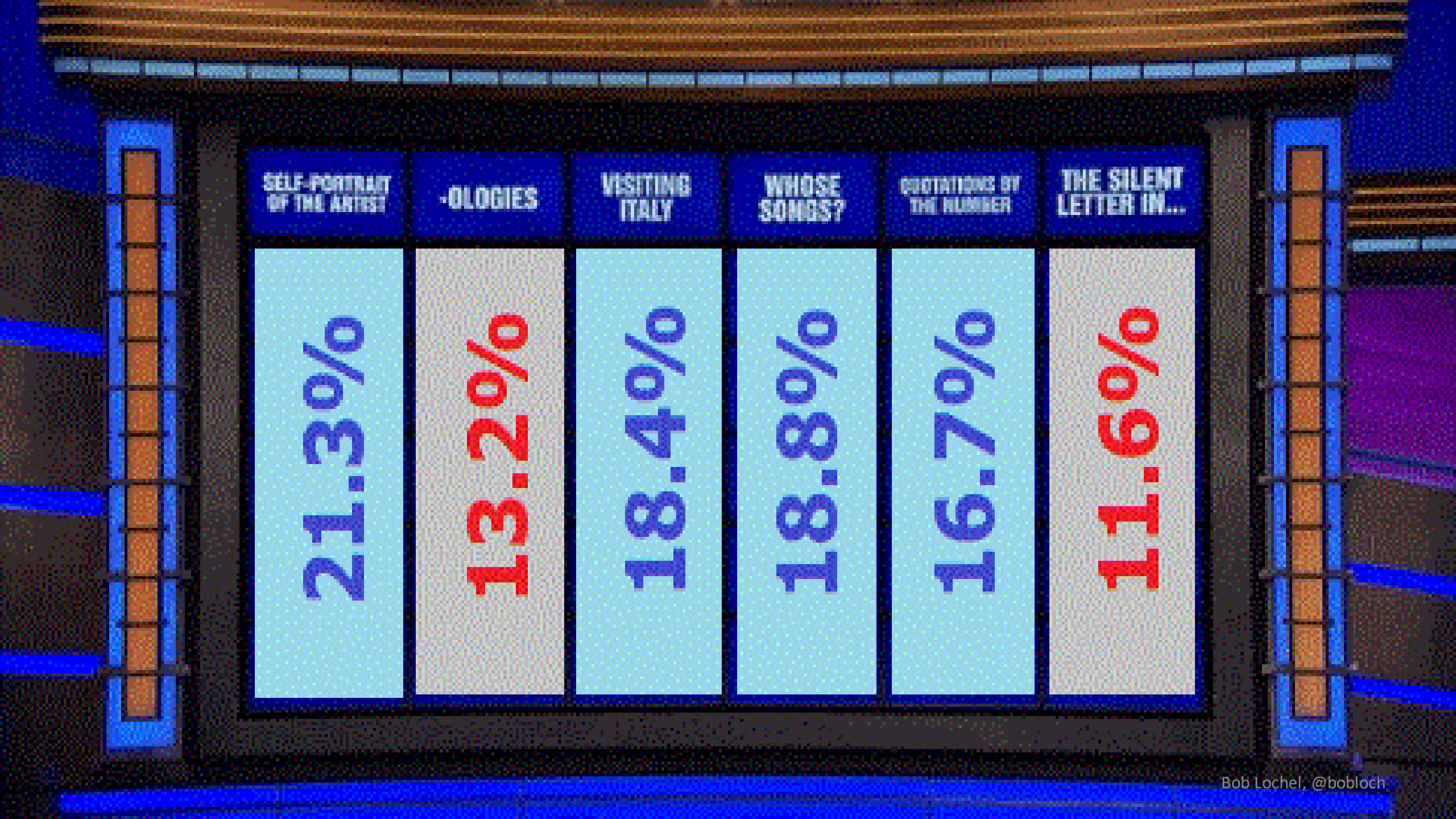
Bob Lochel, @bobloch



Bob Lochel, @bobloch



Bob Lochel, @bobloch


SELF-PORTRAIT OF THE ARTIST
21.3%
-OLOGIES
13.2%
VISITING ITALY
18.4%
WHOSE SONGS?
18.8%
CIVILIZATIONS BY THE NUMBER
16.7%
THE SILENT LETTER IN...
11.6%
Bob Lochel, @bobloch

Source: thejeopardyfan.com

DOES DAILY-DOUBLE HUNTING WORK?

	James Holzhauer	Ken Jennings
Categories With 0 Correct	11	15
% of Bottom-Row Clues Responded To Correctly	58.59%	53.16%
Daily Doubles Played	76	69
Daily Doubles Correct	72	59
Daily Double %age	94.74%	85.51%
Average Daily Double Wager	$8,984	$3,265
Total Net Gain On Daily Doubles	$654,416	$159,299
Average Net Gain On Daily Doubles	$8,611	$2,309
Average Score At End Of First Round	$12,564	$9,327
Average Lead At End Of First Round	$8,273	$5,555

THE CASE OF THE BIMODAL ELECTION

NOT GUILTY DUE TO RANDOMNESS

Bob Lochel, @bobloch

THE CASE OF HAY FEVER

Bob Lochel, @bobloch

JUST THE FACTS…

- On the TV show “The Amazing Race”, teams of 2 complete a series of challenges in a race around the world.
- In the infamous “Hay Fever” task, there are 270 large hay bales, of which 20 contain clues. When a team finds a clue, they can move to the next challenge.
- There are 7 teams remaining.

On average, how many hay bales do you feel it will take to find a clue?

What is the probability you find a clue in the first hay bale you check?
What is the probability is takes you 2 hay bales to find a clue?

TEAMS ARRIVE AFTER COMPLETING PREVIOUS TASK

Hayden and Aaron Arrive

Depart second

Lori and Bolo Arrive

“Vintage” Couple Arrives

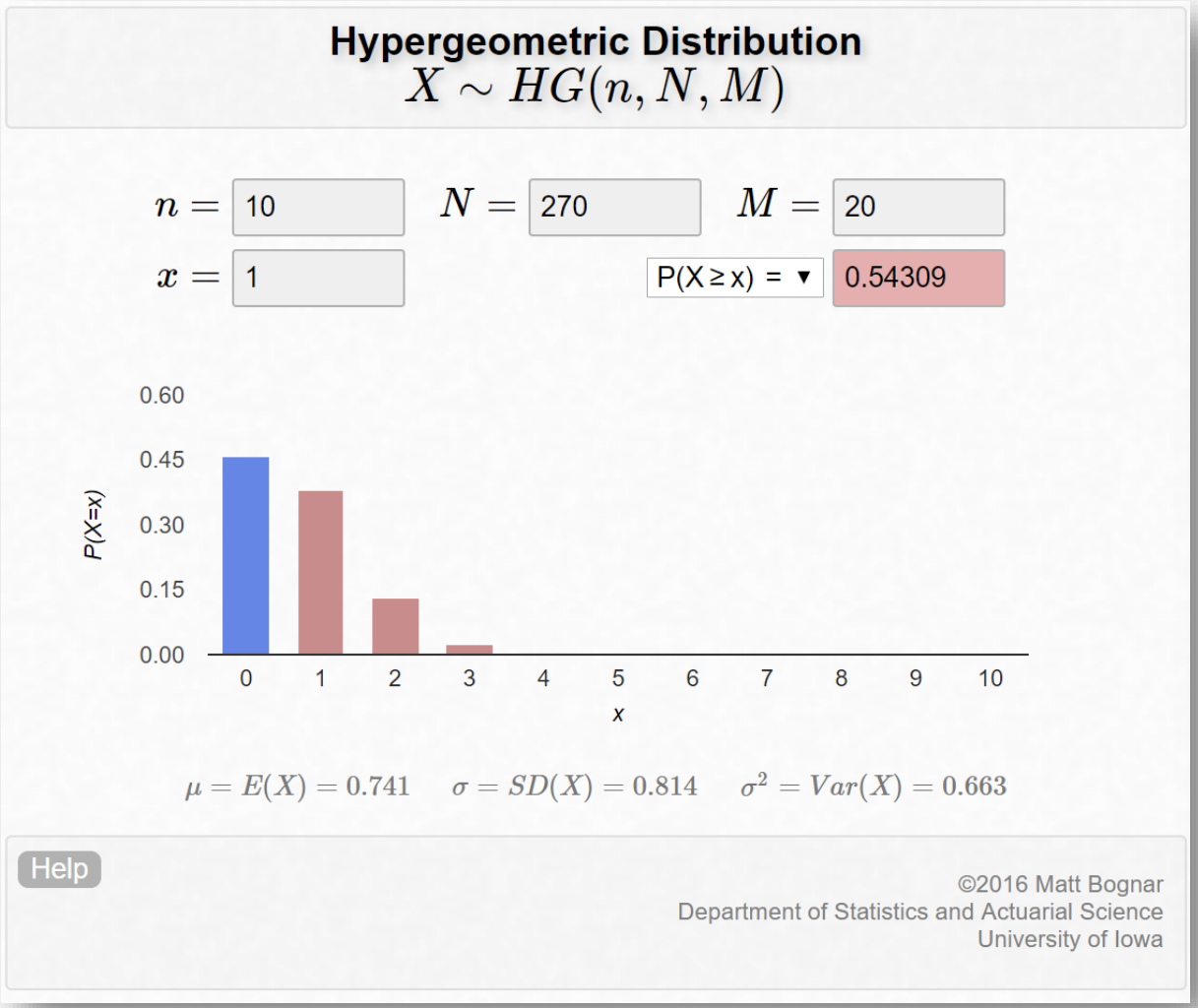
JUST THE MATH

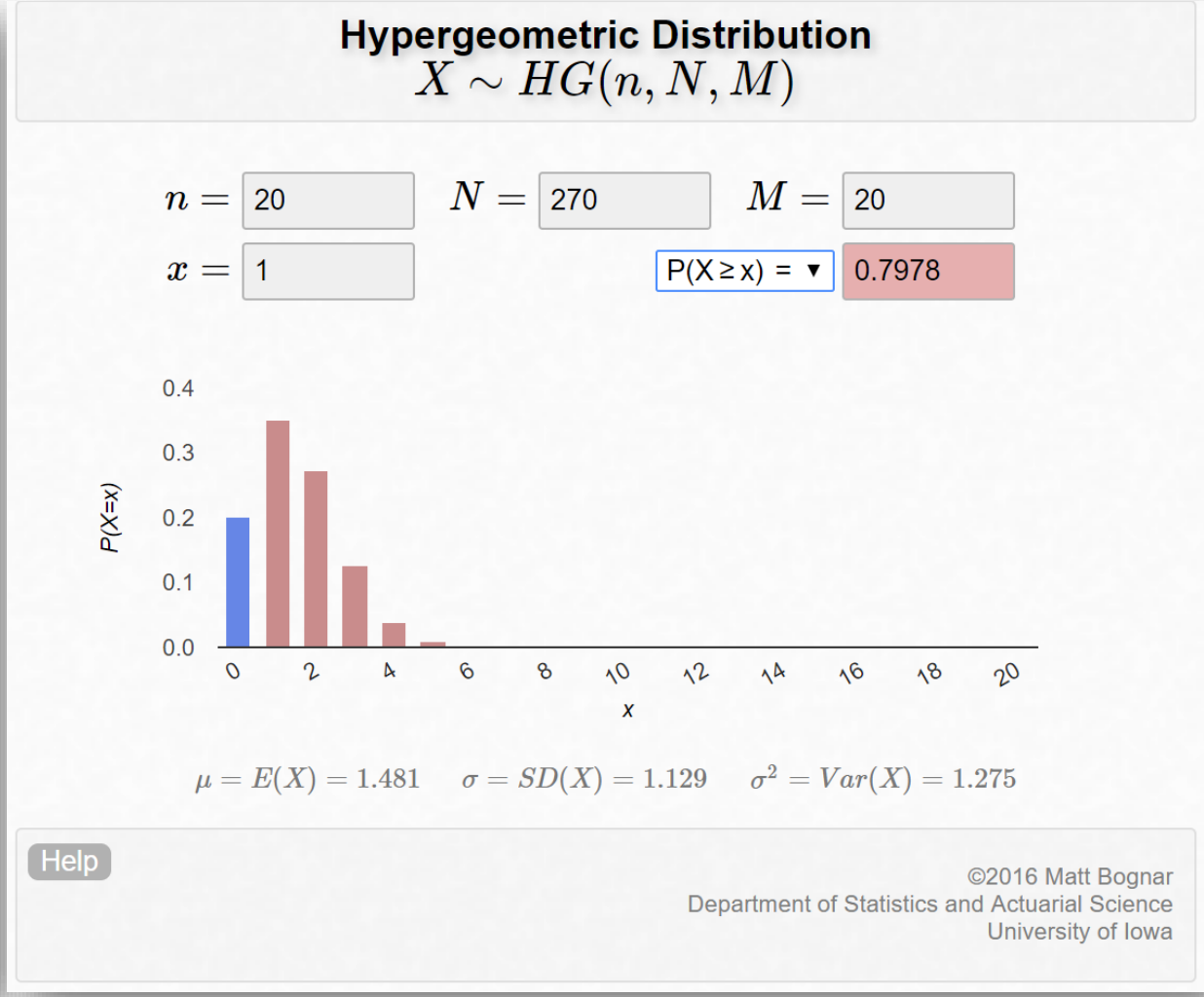
Let X = the number of haybales checked until success	
P (x = 1)	$\left(\frac{20}{270}\right) = 0.0740740740741$
P (x = 2)	$\left(\frac{250}{270}\right)\left(\frac{20}{269}\right) = 0.068842076277$
P (x = 3)	$\left(\frac{250}{270}\right)\left(\frac{249}{269}\right)\left(\frac{20}{268}\right) = 0.0639614813171$
P (x = 4)	$\left(\frac{250}{270}\right)\left(\frac{249}{269}\right)\left(\frac{248}{268}\right)\left(\frac{20}{267}\right) = 0.0594099152308$
P (x = 5)	$\left(\frac{250}{270}\right)\left(\frac{249}{269}\right)\left(\frac{248}{268}\right)\left(\frac{247}{267}\right)\left(\frac{20}{266}\right) = 0.0551663498572$

About a 32% chance you find one clue within the first 5 hay bales.

BUT……

JUST THE (MORE ADVANCED) MATH



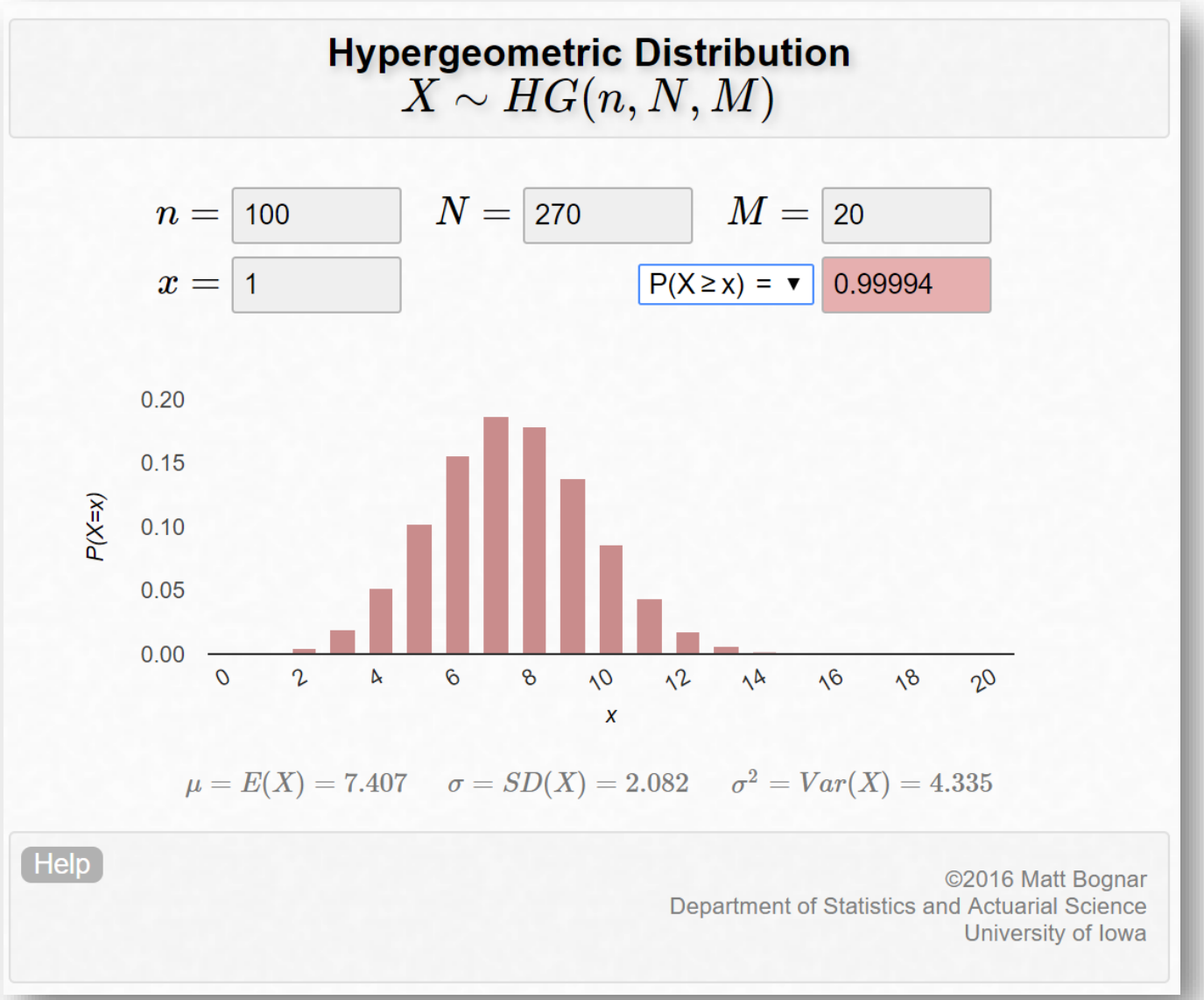


Thanks Matt Bognar! University of Iowa.

BACK FROM OUR MATH COMMERCIAL BREAK….

A LONG DAY'S JOURNEY INTO NIGHT….

A LONG DAY'S JOURNEY INTO NIGHT….



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THE CASE OF THE PLINKO WINNER

Bob Lochel, @bobloch

JUST THE FACTS…

- The game Plinko was first played in 1983.
- Contestants strive to win the "big prize" in the center slot.
- Contestants can earn up to 5 Plinko chips to play.

GALTON BOARD!

Bob Lochel, @bobloch

JUST THE MATH

A Plinko chip encounters 12 rows of pegs on its journey down the board. Safe to assume each pegs yields a 50-50 event (left or right)

Releasing the chip down the middle is optimal strategy…

Check out Game Show talks from Bowen Kerins

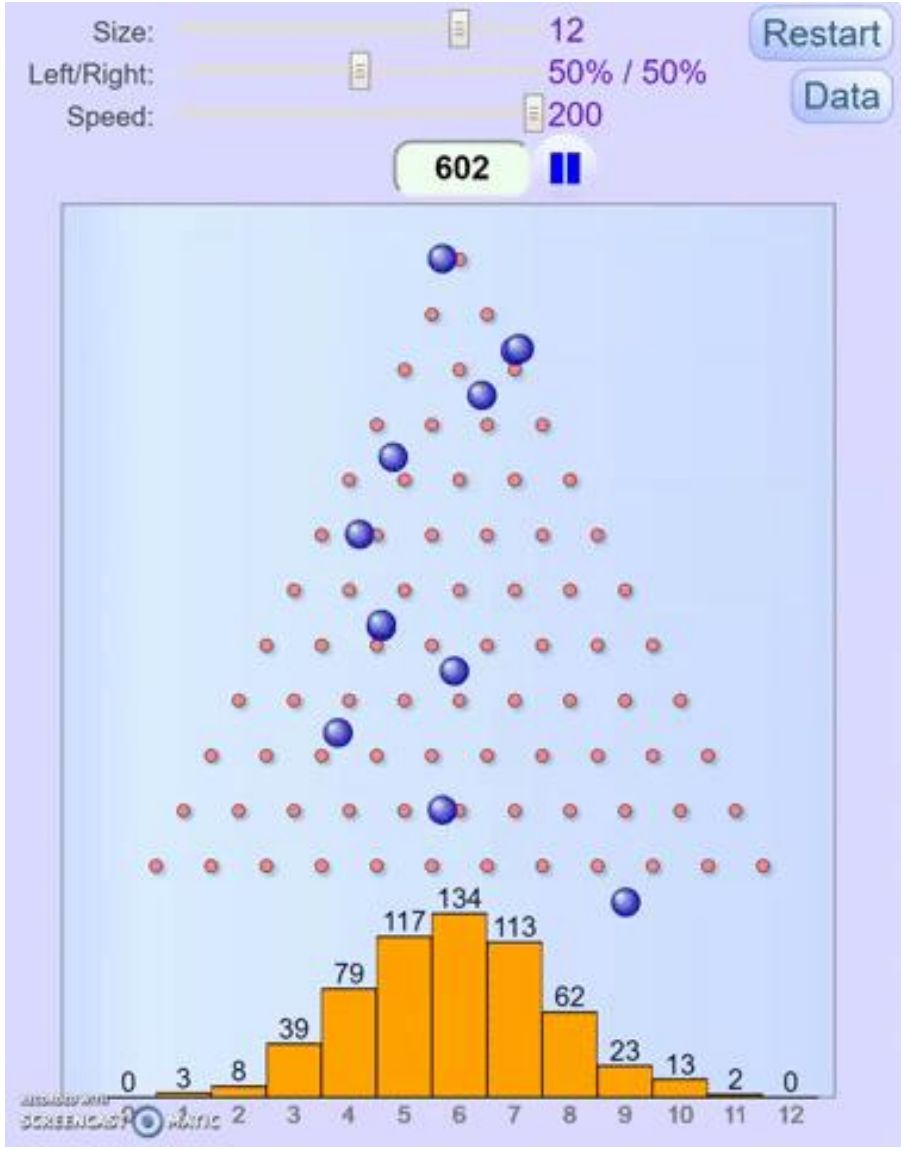
$$\binom{12}{6}(.5)^6(.5)^6 = 0.2255859375$$

Since the year 2000, there have been **2091** Plinko chip releases…

303 have landed in the center slot (just **14.5%**). What gives?

Thanks tpirstats.com!

LET'S SIMULATE!



Galton Board:

https://www.mathsisfun.com/data/quincunx.html

JUST THE FACTS…

- On an 2008 episode of the show a contestant earned 5 Plinko chips.
- The first three Plinko chips each landed in the middle slot, a $30,000 win!
- This segment never aired, so it is not known where the chips were released.

JUST THE MATH

PROBABILITY OF 3 MIDDLE SLOTS IN A ROW

Dropping down the middle:

$$(0.22559)^3 = 0.01148046642229$$

Using historical data:

$$(0.145)^3 = 0.003048625$$

PRODUCERS STOPPED TAPING BEFORE THE 4TH CHIP WAS RELEASED AND THE SEGMENT NEVER AIRED….
WHY????

Bob Lochel, @bobloch

DREW CAREY ON SIRIUS XM

THE CASE OF THE PLINKO WINNER

GUILTY - MUST ENDURE RICE A RONI IN PERPETUITY

Bob Lochel, @bobloch

PROBABILITY EVENTS AS MYSTERY STORIES

- Use scenarios which deserve investigation! Leverage the "Gasp"
- Is it possible? Is it plausible?
- What's the evidence?
- What are the clues?
- Is the mathematics correct?
- What are plausible alternate explanations?

IS IT POSSIBLE? IS IT PLAUSIBLE? BECOME A PROBABILITY DETECTIVE.

Bob Lochel

Hatboro-Horsham High School

Mathcoachblog.com