

Made to Stick: Why Some Ideas Survive and Others Die

How to Communicate Effectively

- The idea is to give you tools for **communicating your data science findings effectively**



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- Chip Heath: professor of organizational behavior at Stanford Graduate School of Business
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A sticky idea is a...

- Simple
- Unexpected
- Concrete
- Credible
- Emotional
- Story

Getting Past the Curse of Knowledge

- In 1990 Ph.D. thesis work, Elizabeth Newton had people tap rhythms of well-known songs (e.g. "Happy Birthday") for listeners
- Listeners correctly guessed 3 out of 120 times
- But tappers *thought* each time that listeners had a 50-50 chance and were surprised their song messages weren't ever getting through
- Tappers didn't adequately imagine what it was like to not have the song already in your head
- Heath brothers: This is a metaphor for the Curse of Knowledge - the better you know something, the harder it is to communicate it

Rule 1: Simple

- "A successful defense lawyer says, 'If you argue ten points, even if each is a good point, when they get back into the jury room they won't remember any.'"
- Find the core of your idea - ideally both simple *and* profound
- Likened to the "Commander's Intent" that appears atop military orders - a very brief statement of objectives that can't become obsolete due to unforeseen events
 - It's suggested that commanders fill in the blank, "If we do nothing else during tomorrow's mission, we must _____."

Simple: Southwest Airlines

- Herb Kelleher, former CEO of Southwest Airlines:
 - "I can teach you the secret to running this airline in thirty seconds. This is it: **We are THE low-fare airline.** Once you understand that fact, you can make any decision about this company's future as well as I can."
- Example - should the airline serve chicken salad in addition to its peanuts on Houston to Las Vegas?
 - "...will adding that chicken Caesar salad make us THE low-fare airline from Houston to Las Vegas? Because [if not], we're not serving any damn chicken salad."
- Example - why are Southwest Airlines employees so visibly having fun on the intercom?

Simple: It's the Economy, Stupid

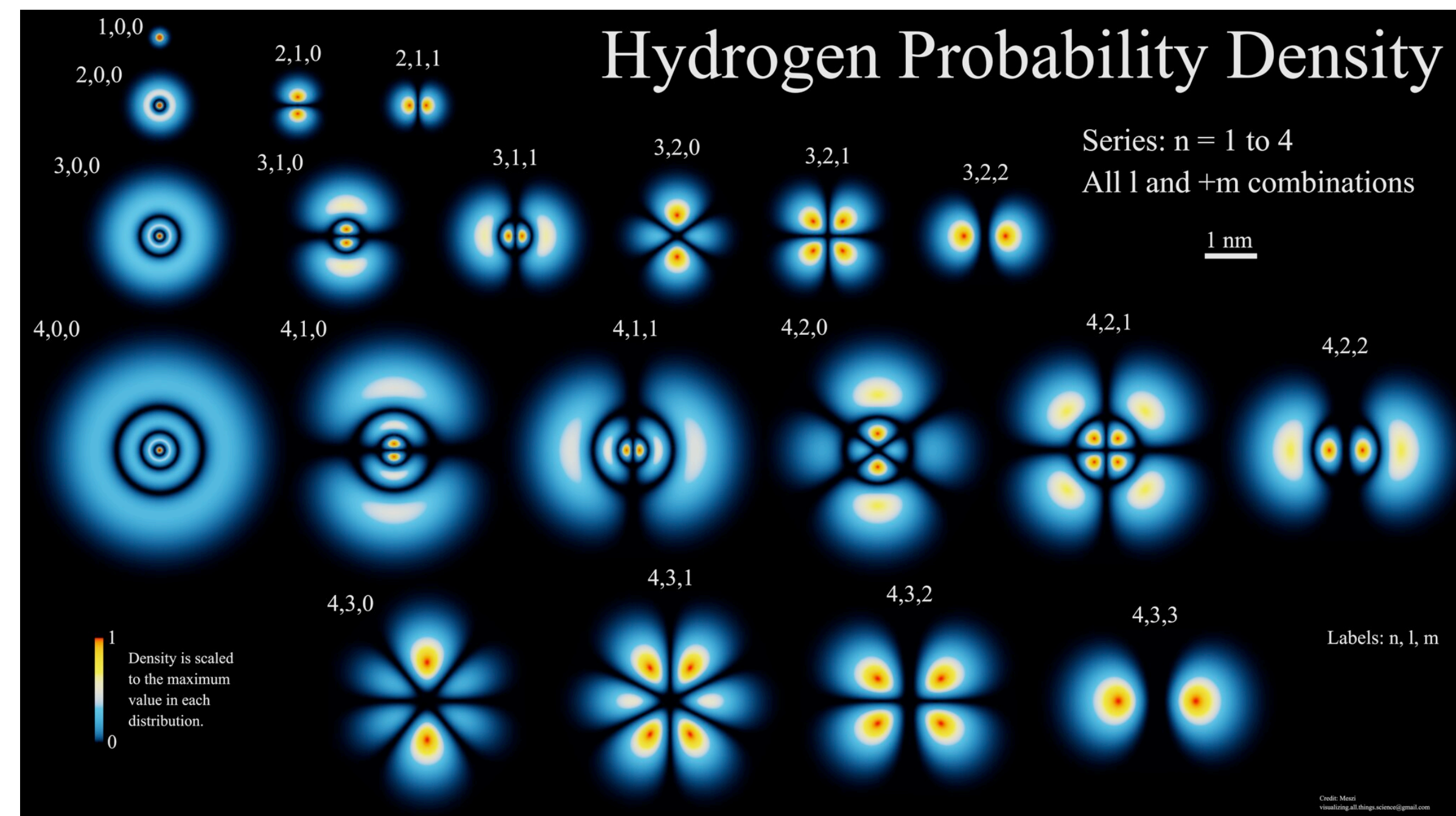
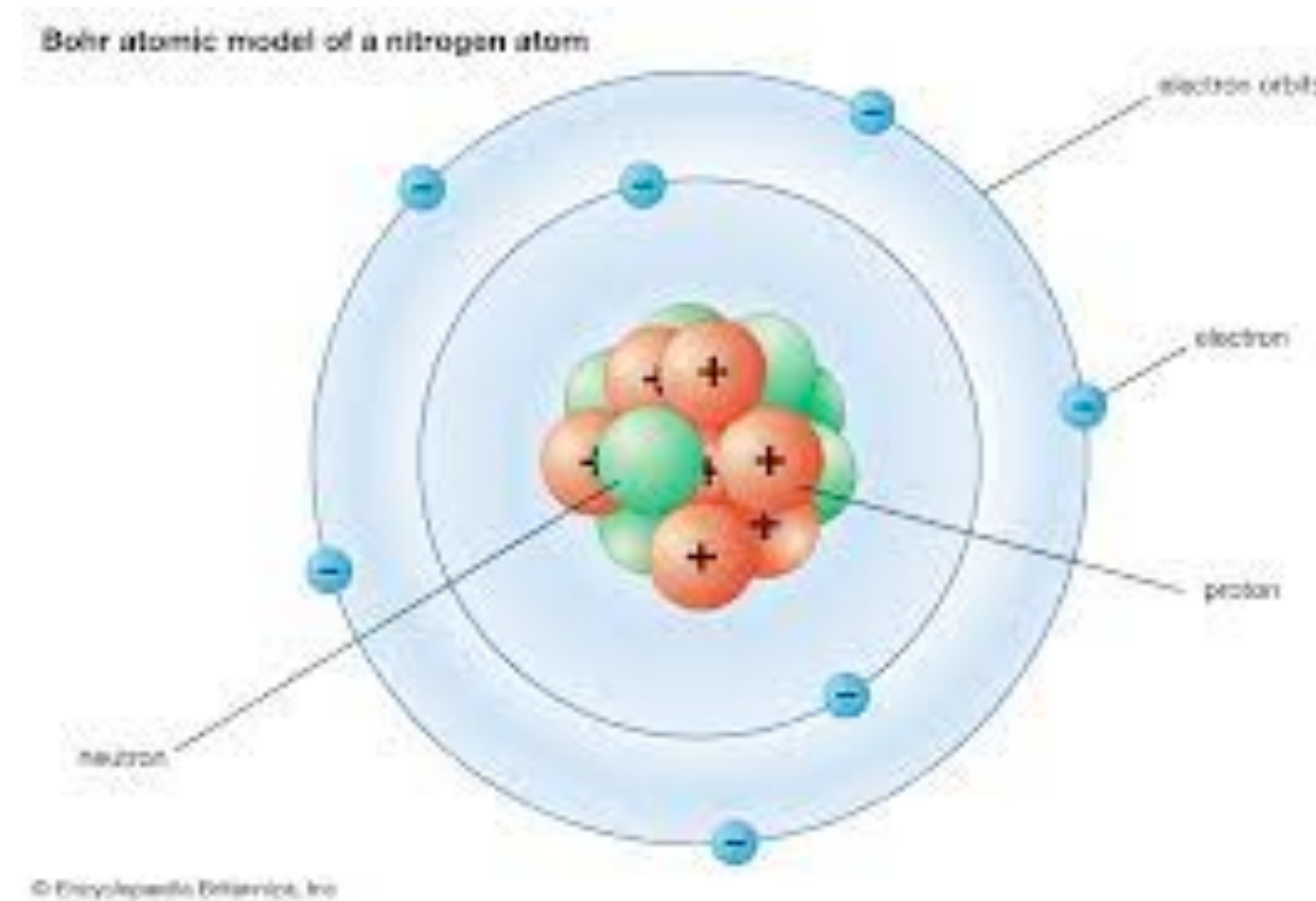
- Bill Clinton was a "policy wonk" who liked to discuss minutia on many political topics
- The famous campaign line "It's the economy, stupid" is due to his political adviser James Carville
 - "There has to be message triage. If you say three things, you don't say anything."
- Clinton avoided talking about the balanced budget, another issue he was fond of, so that the improving the economy message could shine

Simple: Proverbs

- Remember, the core idea is ideally both simple *and* far-reaching
- "A bird in the hand is worth two in the bush."
- "Do unto others as you would have them do unto you."
- "Don't throw the baby out with the bathwater."

Sometimes an oversimplification is necessary

- The Bohr model of the atom is an example - electrons don't really orbit in circular paths, but it's a step in the right direction for elementary school



Rule 2: Unexpected

- It's difficult to get someone's attention, and people think they know everything
- Can therefore try to either **surprise** or generate **mystery**
 - Surprise: A car commercial that ends in an accident - so buckle up! (Actual Ad Council campaign)

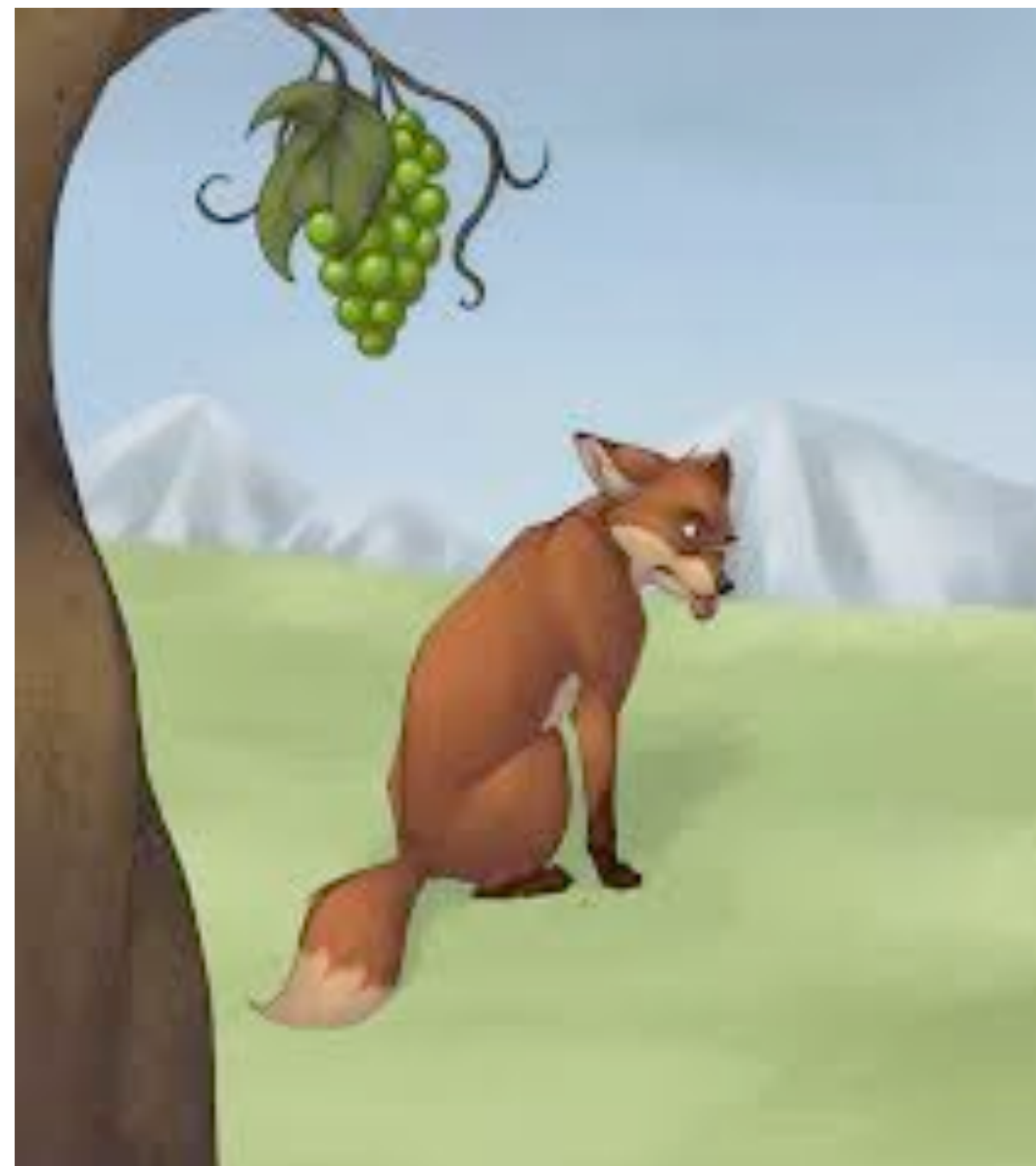


Mystery: Gap Theory of Curiosity

- George Loewenstein, behavioral economist at Carnegie Mellon: curiosity occurs when we sense a gap in our knowledge
- But gaps need to be opened before they can be closed
 - News teaser example: "What chemical in your home may be killing you right now?"
- And gaps must be small; an *abyss* of missing knowledge doesn't work
 - If you want someone curious about what happened in the football game, they've got to know football
 - Roone Arledge of *Monday Night Football*, winner of 36 Emmys, was a master of filling in enough backstory to get people to care about a game and its rivalries

Rule 3: Concrete

- It's much easier for people to remember concrete imagery than abstractions
- Aesop's fables are a clear example of concrete stories, like foxes dismissing unreachable grapes as sour



Concrete Math Education

- 1993 studies comparing Japanese, Taiwanese, and US elementary math education found much greater use of concrete illustrations (like showing tiles moving around) in the Japanese and Taiwanese classrooms
 - 37% of lessons in Japan, 20% in Taiwan, just 2% in US
- US also didn't use word problems as much, 31% versus 61% in the Asian classrooms
- US consistently lags behind the other two in math performance

"Saddleback Sam"

- A very successful church near Irvine, California described the kind of person they were trying to reach as "Saddleback Sam":
 - "Saddleback Sam is the typical unchurched man who lives in our area. His age is late thirties or early forties. He has a college degree and may have an advanced degree. He is married to Saddleback Samantha..."
- Their success in outreach may stem from the concreteness of the person they are trying to reach -- if a campaign seems like it could reach many but wouldn't sway Sam, it's trashed
- 50,000 members of the church - with a concrete goal, the church prospered

Rule 4: Credible

- You want people to *believe* your message
- Where does authority come from?
 - Experts
 - Firsthand knowledge
 - Details
 - Statistics
 - "Try-it-yourself"

Details are convincing

- Research shows subjects more willing to side with a defendant (rated suitable parent 5.8/10 versus 4.3/10) when the arguments in her favor contained more details like son's "Darth Vader toothbrush"



"Try-it-yourself"

- Wendy's 1984 "Where's the Beef?" campaign increased revenue 31% by just asking the listener to note that their patties had more beef than Burger King or McDonald's



Rule 5: Emotional

- The listener has to *care* about the message - some emotion should be invoked
- John Caples, very successful ad copywriter: "The most frequent reason for unsuccessful advertising is advertisers who are so full of their own accomplishments (the world's best seed!) that they forget to tell us why we should buy (the world's best lawn!)."
- At the same time, avoid "Maslow's basement" - assuming that others work on more base desires than you

Maslow's Hierarchy, More Like a List

- In 1954, Maslow identified the following general human needs
 - Transcendence: helping others realize their potential
 - Self-actualization: realize our own potential
 - Aesthetic: finding order, symmetry, balance
 - Learning: knowing and understanding
 - Esteem: achievement, gaining approval
 - Belonging: finding love and friends
 - Security: finding safety
 - Physical: hunger, thirst
- Maslow thought of people starting on the bottom and working up, but everybody actually pursues these simultaneously

Rule 6: Stories

- Credible ideas make people believe, emotional stories make people care, and stories make people *act*
- Hearing a story is like engaging in a simulation, with the relevant brain areas activated
 - Studies show people who imagine activities can practice and improve that way
- The audience is thus more prepared to act on the message
- Jared Fogle is a prime example: man lost 245 lbs eating at Subway; story resulted in an ad campaign that caused 18% sales growth (where 7% is normal)

An alternative checklist

- For an idea to stick, it needs to make the audience...
 - Pay attention
 - Understand and remember it
 - Agree and believe it
 - Care
 - Be able to act on it

Curse of Knowledge dangers

- But it's easy to *believe* that the audience will...
 - Pay attention - of course, it's so interesting!
 - Understand and remember it - because everything was perfectly clear
 - Agree and believe it - as all right-thinking people should
 - Care - the way you do!
 - Be able to act on it - the intended course of action is so obvious

Proxies

- Pay attention - UNEXPECTED
- Understand and remember it - CONCRETE/SIMPLE
- Agree and believe it - CREDIBLE
- Care - EMOTIONAL
- Be able to act on it - STORY

How does this apply to data science work?

- Simple?
- Unexpected?
- Concrete?
- Credible?
- Emotional?
- Stories?

Summary

- Heath and Heath argue that the most memorable messages are
 - Simple
 - Unexpected
 - Concrete
 - Credible
 - Emotional
 - Stories

What did we learn in this course?

- Suppose your boss at a telecom company wants you to make a model predicting when people decide to leave the service for a different one. You can...
 - use SQL to extract tables of data from the company's relational database (lecture 29)
 - join multiple such dataframes to create a single large table (lecture 28, 29)
 - explore the dataframe with essential stats such as mins, maxes, averages and correlations, possibly uncovering problems with the data (lecture 11)
 - clean the columns that have missing or badly formatted data (lecture 13, 28)

What did we learn in this course?

- Use decision forests with scikit-learn (20, 22)
- Write predictions on a new dataset to a CSV (15)
- Visualize the impact of the most important features using matplotlib (4) or seaborn (30)
- Effectively communicate what the most important feature is in a presentation (35)

Other tools included scraping the web, optimizing code for speed, NLP, regression, calculating centrality, pivot tables, and generally programming in Python!

Course Evaluations are Open!

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