

Quantitative Methods of Policy Analysis

An Introduction

1.14.13

Pick a range for each question 90% likely to contain the correct answer

- In Spring 2011, how many on-campus degree-seeking students were enrolled at CU?
- What percent of CU students are graduate students?
- Population of the City of Boulder in 2011?
- How many housing units were in Boulder in 2011?
- Population of Boulder County in 2011?
- Size of Boulder County in square miles?
- When was the city of Boulder incorporated?
- What year did Colorado gain statehood?
- Estimated population of the United States 7/2011?
- Number of nations in Africa?

Answers

- CU students: 29,894 *CU “At a Glance” 7/2011
- Grad students: 17.1% * CU “At a Glance” 7/2011
- City pop: 98,889 *U.S. Census 7/2011
- Housing units: 43,620 *2011 Boulder Community Data Stats
- County pop: 299,378 * U.S. Census 7/2011
- County size: 741 mi² *County Land Use Department
- Incorporation: 1871
- Statehood: 1876
- U.S. pop: 311,591,917 * U.S. Census 7/2011
- African Nations: 54 * U.N. Member Roster

“Bad decisions can damage a business and a career, sometime irreparably. So where do bad decisions come From? In many cases, they can be traced back to the way the decisions were made – the alternatives were not clearly defined, the right information was not collected, the costs and benefits were not accurately weighted. But sometimes the fault lies not in the decision making process but rather in the mind of the decision maker”

Hammond et al. 1998
Harvard Business Review

Hidden Traps in Decision Making

- The Anchoring Trap
- The Status Quo Trap
- The Sunk Cost Trap
- The Confirming Evidence Trap
- The Framing Trap

The Anchoring Trap

Disproportionate weight given to initial info

Take the last 3 digits of your phone number and add to 400, do you think that Attila the Hun was defeated in Europe before or after that year?

Take a guess as to when Attila the Hun was defeated

TABLE 1. Estimates of date of Attila's defeat depend on initial anchor (after Russo and Schoemaker 1989).

Range of initial anchor (last three digits of phone number plus 400)	Average estimate of year of Attila's defeat
400–599	629
600–799	680
800–999	789
1000–1199	885
1200–1399	988

Actual Date of Atilla the Hun's Defeat...451 AD

Solutions

- Always view a problem from different perspectives
- Consider a problem on your own before consulting others
- Seek information and opinions from a variety of people
- Do not provide your own opinion first when asking for advice
- Be aware of the strategic advantage of providing the initial proposal

The Status Quo Trap

Breaking from the status quo means taking action

Taking action means taking responsibility

Taking responsibility means risk of criticism and regret

But...not taking action is in itself a decision at a minimum to condone the current state of affairs

Consider: Is getting a degree in ENVIS (or whatever else) really serving your career objectives?

Solutions

- Focus on your objectives and their relationship to the status quo
- Never use the status quo as your *only* alternative
- Ask yourself if you would choose the status quo if it weren't the status quo
- Avoid exaggerating costs of switching from SQ
- Evaluate alternatives in terms of the future as well as the present

The Sunk Cost Trap

Make decisions in a way that justifies past decisions. E.g., lenders throwing good money after bad

Penalties for failure often reinforce the sunk cost trap

Solutions

- Reassign problems to someone new without a history or vested interest in the original decision (or seek out independent opinions)
- Examine why admitting a mistake distresses you - be realistic
- Do not cultivate a failure-fearing culture

The Confirming Evidence Trap

“We seek out information that supports our existing interests or point of view while avoiding information that contradicts it.”

Hammond et al. 1998

- We often decide what to do before we figure out why we want to do it.
- We are more engaged by things we prefer than not

Solutions

- Double check that you are considering pro as well as con evidence
- Find a devil's advocate
- Avoid leading questions that invite confirming evidence

The Framing Trap

- Adopt Policy A: \$2M of \$6M will be saved
- Adopt Policy B: 33.3% chance to save \$6M
66.6% chance to save \$0

72% Favor A

- Adopt Policy C: \$4M of \$6M will be lost
- Adopt Policy D: 33.3% chance of losing \$0
66.6% chance of losing \$6M

78% Favor D

A = C and B = D

Solutions

- Always try to reframe the problem in multiple ways
- Try posing the problem in a neutral or redundant way

The Groupthink Trap

Each subject was asked whether the test line in Fig. 1 was equal in length to line A, B, or C.

- If subjects were tested individually, 99% of subjects answered B.
- If person in front of the test subject said A, the error rate increased from 1% to 2%.
- If two people ahead of the test subject said A, the error rate increased to 13%.
- If three people ahead of the test subject said A, the error rate increased to 33%.
- If, as well, the subject was told a monetary reward for the group as a whole depended on how many members of the group gave the correct answer, the error rate increased to 47%.

Russo and Schoemaker (1989)

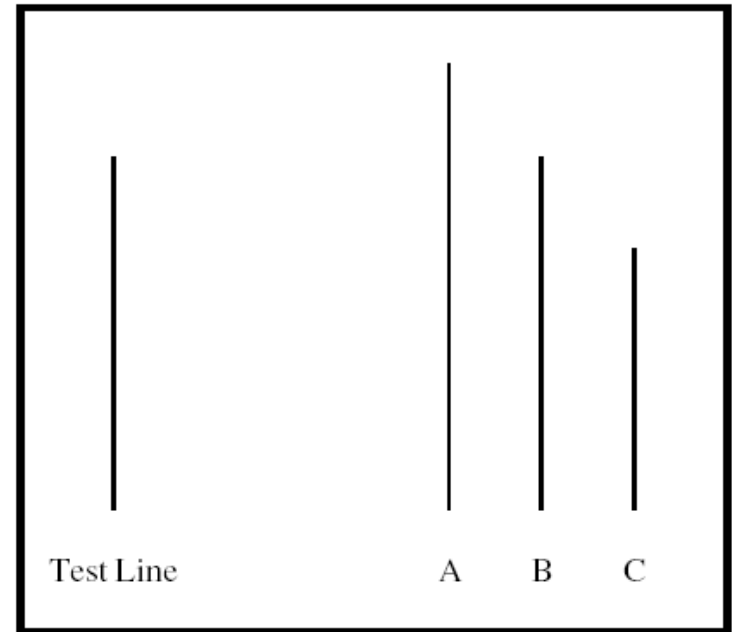


FIG. 1. The "Asch" test. Is the test line equal in length to A, B, or C?

Estimating and Forecasting Traps

Distance/weight/volume – frequent judgment and quick feedback

Estimates of uncertain events – feedback rare, sometimes impossible

E.g. Judge likelihood that Dow Jones will be higher in 1 year...

...compare to weather forecasts

- The Overconfidence Trap
- The Prudence Trap
- The Recallability Trap
- The Confirming Evidence Trap
- The Framing Trap

The Overconfidence Trap

Most people set too narrow a range of predictions

When asked about the level of the DJIA closing price one week ahead at 1% level of being exceeded or falling below, actual results show DJIA falls outside the predicted range 20-30% of the time.

- Only 1 week!
- How reliable is expert elicitation?

How do your risks compare to your peers for various diseases?

- Asthma
- Drug addiction
- Food poisoning
- Influenza
- Lung cancer
- Pneumonia

Above average OR Below average

How do your risks compare to your peers for various diseases?

Ratio of “Below Average” to “Above Average”

- Asthma 9:1
- Drug addiction 8:1
- Food poisoning 7:1
- Influenza 3:1
- Lung cancer 2:1
- Pneumonia 5:1

The Prudence Trap

Too cautious: “Just to be on the safe side”

US automaker planning production based on anticipated sales, dealer inventories, competitor actions, and costs. Each department slanted its forecasts towards building more cars. Compounded by upper management slanting as well. Result was oversupply and loss of potential revenue.

State out loud what you anticipate your grade will be in this class.

The Recallability Trap

- Overemphasize extreme events
- Overemphasize new information

Chance of dying in a plane crash: 1 in 2,089,232

Chance of dying in a car accident: 1 in 88,263 ...

24x

Chance of dying in a motorcycle accident = 16x car accident

Are we conflating the magnitude of an outcome with probability?

Quantitative methods as a solution?

- Yes?
 - Consider statistics on car vs plane accidents
 - *If past occurrence is a good guide to the future*
- No?
 - Consider expert elicitation of DJIA
 - *Making uncertain projections of the future*

Some definitions

- What is policy?
 - A commitment to a course of action in pursuit of desired ends; a decision
- What is a “policy process”?
 - Formulation, promulgation, and application of decision
- What is politics?
 - Bargaining, negotiation, and compromise in pursuit of desired ends