Strategic Decision Making

Overcoming Heuristics and Biases

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Where Are We?

The Competitive Environment

The Organization

Understanding of the Organization and Its Competitive Environment

INFORMING

Content Process

Agreement Design Resource Allocation

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Heuristics and biases

- We heavily bias the results obtained in interviews by how we ask the question.
- The most obvious ways that we bias answers are well-studied.
- Simple techniques exist to “debias” the results.

Theory and practice show that:
- non-experts make poor estimates
- experts make good estimates, but are overconfident in their estimates
- expert estimates improve when facilitation removes certain biases
- procedures for integrating multiple expert estimates and confidence intervals affect the implicit risk profile of the estimates

Spending a little more time preparing our questions can significantly increase the credibility of the information obtained.
Expert estimates are judgments given by people and people are easily biased.

Everyone falls victim to biases, specifically:

- **motivational bias**: a discrepancy, usually conscious, motivated by one’s personal situation

- **cognitive bias**: a discrepancy, usually subconscious, introduced by the manner in which the individual processes information

**Bias**: “A preference or inclination, especially one that inhibits impartial judgment.”

These well-studied biases affect the calibration of estimates from non-experts and experts equally.
Example of Motivational Bias

Think of a major project you are working on now at work.

How long will it take you to finish your next major project?

Your estimate: _______________ months

Historical average: ____________ months
Motivational Biases affect the response the interviewee “wants” to give.

**Cause:**
Adjustment of response motivated by perception of reward or penalty.
- *Reward:* Will “improve” expected results for their area, and “weaken” expected results for the internal and external competitors.
- *Penalty:* Will give low estimate, ensuring success.

**Examples:**
- Product champion understates costs and overstates sales.
- Development geologist overestimates the probability of success.
- Individual suppresses uncertainty to appear as “expert.”
- Salesman gives low sales projections to ensure “meeting expectations.”
Debiasing “motivational biases” focuses on changing the interviewee’s desire to give biased results.

Techniques for debiasing “motivational biases”:
- Evaluate the factors potentially causing “motivational biases.”
  » What will cause the interviewee to want to give a biased assessment?

- Design reward system to encourage truthful responses.
  » Is it possible to couch the question as to avoid obvious motivational bias?

- Use formal assessment techniques making it difficult for subject to serve own interests.
  » Beyond the scope of this course.

- Disqualify subject.
  » When the interviewer is not able to remove motivational bias, the results from the interview should be considered biased and disqualified.
Cognitive Biases affect the response the interviewee is able to give, whether he or she is aware or not.

For expert estimate elicitation, the most relevant of the many well-known causes for cognitive heuristics and their associated biases are:

- Ignoring elementary statistical principles
  Base rate
- Collecting incomplete or improper data
  Confirmation
- Processing data improperly
  Anchoring and adjusting
  Overconfidence
Frank is currently in a group of professionals consisting of 30 lawyers and 70 engineers. We know the following about him.

- He is a 30-year old man.
- He is married with no children.
- He is an avid reader of history.
- He is well respected for his rhetorical skills.
- A man of high ability and high motivation, he promises to be quite successful in his field.
- He is well liked by his colleagues.

What do you assess as the probability of Frank being an engineer?
Even experts frequently violate the “base rate” statistical principle.

**Base Rate:** (the “odds” or probability that something will happen)

*What we do:* We place more emphasis on “diagnostic” data than on base rates.

*Example:* Even if told, hypothetically, that 50% of all sports fans are women (base rate), and that two million viewers are watching a football game, when asked the most probable number of men watching the football game (diagnostic), most interviewees will skew the estimate to a high percentage of male viewers.

*Fix:* When the interviewee has little direct knowledge about the measure in question, review the base rate with him/her before having interviewee infer value from diagnostic data.
We search to confirm our beliefs by collecting incomplete and improper data.

**Confirmation Bias:**

*What we do:* We look for data that supports our preliminary findings or beliefs.

*Example:* A company has experienced a recent decrease in market share. Since his company did all of his marketing for “new users,” this is where the marketing manager looked for the problem, but did not find it. By asking “disconfirming” questions, it turned out that he was capturing a high percentage of new users, while losing a high percentage of current users, which he was not measuring. His decrease in market share resulted from a net loss in customers.

*Fix:* Ask disconfirming questions, such as “What data or causes would lead the interviewee to change his/her mind?” A lack of disconfirming data increases confidence in the interviewee’s assessment.
Two cognitive biases result from the difficulty humans have with processing data properly.

Cognitive biases resulting from improper data processing:

- Anchoring and adjusting
- Overconfidence
Certain cognitive processes cause us to process data improperly, by anchoring and adjusting.

**Anchoring and adjusting:**

*What we do:* We make assessments by starting from an initial value and adjusting it to yield a final decision -- premature estimates play too large a role in determining final assessments. This leads us to state overly narrow confidence intervals, which reflect more certainty than justified by the knowledge of the assessed quantities.

*Example:* When an expert group was asked to estimate the prime interest rate six months later, the average guess was 10.9% (in 1983). Another similar group was asked if the rate would be above or below 8%, and then for their best estimate. Their average guess was 10.5%, 40 base points lower.

*Problems Areas:* Strong in point estimates, when we suggest a value first. Strong in range or distribution estimates, when start with mid-point estimate.

*Fix:* Use probability assessment procedure (see next section) that removes rather than creates anchors.

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Certain cognitive processes cause us to process data improperly, by being overconfident in our abilities.

**Overconfidence:**

*What we do:* We are insensitive to our degree of knowledge, especially when answering moderately to extremely difficult questions. We fail to collect key data because we are too confident in our opinions.

*Example:* When doctors diagnose an x-ray, they are 50% correct, but they think they are right 95% of the time.

“A severe depression like that of 1920-21 is outside the range of probability.” -- Harvard Economic Society, November 16, 1929.

*Fix:* Use probability assessment procedure (see next section) that corrects for overconfidence.
Are experts overconfident?

Answer the following questions, giving your “90% certain” estimate at the narrowest range.

1. Martin Luther King’s age at death
2. Length of the Nile River
3. Number of member countries in the OPEC
4. Number of books in the Christian Old Testament
5. Diameter of the moon
6. Weight of an empty Boeing 747
7. Year of birth of Wolfgang Amadeus Mozart
8. Gestation period of an Asian elephant
9. Distance by air from London to Tokyo
10. Deepest known point in the oceans
A “90% certain” range estimate for 10 questions should give us the right answer 9 times out of 10.

The answers are:

1. Martin Luther King’s age at death 39
2. Length of the Nile River 6700 kms (4187 mi.)
3. Number of member countries in OPEC 13
4. Number of books in the Christian Old Testament 39
5. Diameter of the moon 3,456 kms (2,160 mi.)
6. Weight of an empty Boeing 747 180,000 kgs (390,000 lbs.)
7. Year of birth of Wolfgang Amadeus Mozart 1756
8. Gestation period of an Asian elephant 645 days
9. Distance by air from London to Tokyo 9,550 kms (5,959 mi.)
10. Deepest known point in the oceans 10,860 meters (36,198 ft)
Exercise

*Individual (10 minutes)*
Identify 3-4 decisions in which you have participated in the past six months where a bias could have entered. What would you do different next time?

*In groups of two (15 minutes)*
Share with your colleague how two of the decisions were biased. The other person can help see, through the process of inquiry, if there were possibly other biases also.

*Group discussion (15 minutes)*
What were the biases that came up most? What would be the implications of reducing these typical biases?
What’s Next

- How we can improve our ability to experience the system
- Technologies that further enable our systems experiencing
- Improving our strategic decision making
Reflections from Today

Please write down any insights from today’s class, and next to them what you are going to do differently tomorrow.
The following template might help you organize these thoughts.

<table>
<thead>
<tr>
<th>Insights</th>
<th>Related Action Items</th>
</tr>
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<tbody>
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