



Judgment and Decision Making

Instructor Manual

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Humans are often not as rational when it comes to decision-making as we'd like to think. We are full of bias and often rely on what we think we know. Because judgment and rational decision-making involve complex processes that use more resources than our brains can process, we often make emotional decisions. Psychologists know that judgment isn't rational. Three important biases are overconfidence, anchoring, and framing. We use the easiest information to access and do not always pay attention to more complicated aspects of the decision-making process. Because our biases are predictable, researchers are coming up with ways to overcome these biases to help people make better decisions, by pushing the use of System 2 processing to make logical and unemotional decisions and by changing the environment and framing of the question to push people to better decisions.

Learning Objectives

- Relevant APA Learning Objectives (Version 2.0)
 - Describe key concepts, principles, and overarching themes in psychology (1.1)
 - Describe applications of psychology (1.3)
 - Use scientific reasoning to interpret psychological phenomena (2.1)
 - Demonstrate psychology information literacy (2.2)
 - Engage in innovative and integrative thinking and problem solving (2.3)
 - Incorporate sociocultural factors in scientific inquiry (2.5)

- Content Specific Learning Objectives: Judgment and Decision Making
 - Understand the systematic biases that affect our judgment and decision making.
 - Develop strategies for making better decisions.
 - Experience some of the biases through sample decisions.

Abstract

Humans are not perfect decision makers. Not only are we not perfect, but we depart from perfection or rationality in systematic and predictable ways. The understanding of these systematic and predictable departures is core to the field of judgment and decision making. By understanding these limitations, we can also identify strategies for making better and more effective decisions.

Class Design Recommendations

Judgment and decision making is ideally taught in one class period. This topic is one that some instructors omit, but it provides some explicit real-world uses of psychology. Please also refer to the Noba PowerPoint slides that compliment this outline.

1st class period (50 min – 75 min):

- Introduction
- What Does a Rational Decision look like, six steps
- Bias
 - Overconfidence / Activity
 - Anchoring
 - Framing
- Activity
- Bounded

- willpower bounded
- self-interest bounded (activity)
- ethicality
- awareness
- Fixing it
- Conclusions

Module Outline

Introduction

- According to Herbert Simon's bounded rationality framework, we try to make rational decisions, but cognitive limitations prevent us from being fully rational. We retain a relatively small amount of information in our usable memory and are left with making the best decision with the information we have.
- Tversky and Kahneman's research provides critical information about systematic biases in our judgment.

What Would a Rational Decision Look Like?

- When faced with making a difficult decision there are six steps you should take:
- Define the problem
- Identify the criteria necessary to judge the multiple options
- Weight the criteria
- Generate alternatives
- Rate each alternative on each criterion
- Compute the optimal decision
- Unfortunately, when faced with a large decision we rely heavily on our intuition, or the way we think through these six questions is biased by our intuition.

Biases in Our Decision Process

- Bounded rationality taught us that judgment is not rational, but it didn't tell us how our decision making is biased. Heuristics allow us to cope with the complexities of decision-making and also lead to predictable bias.
- Overconfidence is our tendency to be overly confident in our judgments, thinking we are right, when in fact we may be wrong. When asked to give a range answer to 10 questions, most people will be overly confident they know the answer and make their range too small, answering 3-7 questions correctly.
- Anchoring is when we allow the first information provided to affect our thinking. In the problem about corrupt businessmen most people say 10 is low and 200 is high. But when asked what number they think, the people who heard 10 in the question tend to give numbers half as small as those who hear 200. They have anchored onto that first number and shift their guess from that.
- Framing is how the question is asked. In the examples given, the same question is asked about 600 sick people. However, the first question is framed around saving lives and the second question around losing lives. Answers differ based on the outcome even though the choices are objectively the same in both scenarios.
- These are only three types of bias that affect our judgment; there are many other assumptions we make that bias our decision making.

Contemporary Developments

- In 2000, Thaler suggested that decision making is bounded in two ways not captured by bounded rationality.
- First our willpower is bounded and we give more weight to present concerns than future concerns. And our immediate concerns are not always consistent with our long-term goals.
- Our self-interest is bounded in that we care what happens to others. Sometimes we may give a positive outcome out of a desire to be fair, other times we give a negative outcome to ourselves in order to harm others.
- Bounded ethicality refers to the notion that our ethics are limited in ways we're not aware of ourselves.
- Bounded awareness refers to the array of focusing failures affecting our judgment, specifically failing to notice important information.

Fixing Our Decisions

- We all have biases; one path to fixing them is the distinction between System 1 and System 2 decision-making. System 1 processing is our intuition. It is fast and emotional. System 2 processing is slow and logical. The six steps for rational decision-making are a System 2 process.
- System 2 is not required for every decision we make. System 1 is more than sufficient for decisions like what to wear or what to eat. But we should rely on System 2 more than we do, because often people use System 1 for big decisions that would be better made in a logical manner.
- One example of overriding System 1 and making System 2 decisions is Billy Beane of the Oakland Athletics. His story is featured in the movie Moneyball.
- The book “Nudge: Improving Decisions about Health Wealth, and Happiness” outlines a strategy for how we can change environments, taking into account human biases.
- Opt-in vs. Opt-out is one environment change. Many companies have an opt-in policy for retirement plans, when this is changed to an opt-out policy enrollment increases. Many people want to be part of the plan they just don’t get around to doing so, and those who feel strongly against opt out. A similar trend is seen in the differing policies for organ donations around the world. Countries with opt-out policies have much higher donation rates than countries, such as the US that have opt-in policies.
- Our bias is predictable, meaning research can open new ways of helping people make better decisions.

Difficult Terms

Bounded awareness

Bounded ethicality

Bounded rationality

Self-awareness bounded

System 1

System 2

Willpower bounded

Lecture Frameworks

“Judgment and Decision Making” is a module that really gets students thinking about what they know and what they think they know.

1st class period

- Discussion/warm-up
 - Start by asking students about the criteria they use to make decisions? *pro/con lists, what you want, location, cost, pay, impact on others, etc...* Ask if students think they make rational decisions most of the time.
- Lecture – Bias in Thinking: Refer to PowerPoint slides for the following:
 - Talk about the theory of Simon and Tversky and Kahneman. Talk about the six points of rational decision making and why we don't often follow these.
 - Activity Slides: Ask students the 10 questions from problem 1 in the Noba module. The questions are also contained in appendix slides. Students should write their answer and put a lower and upper range so that they are 98% sure their answer is in the range. *Even if students have answered these questions while reading, it is unlikely they will have remembered all of the answers, although ranges may be smaller. And if they do, then they have already learned the point of the activity through reading on their own.* After showing the answers, ask how many students got 9-10 correct, meaning the correct answer was in their RANGE. Then ask how many of these students remembered the answers from the reading. Then ask how many students got 3-7 correct.
 - Discuss overconfidence.
 - Remind students of Problem 2. Discuss anchoring.
 - Remind students of Problem 3. Discuss framing.
- Activity – The Monty Hall Dilemma *See Activities/Demonstrations for instructions*
- Lecture: Contemporary Developments: Refer to PowerPoint slides for the following:
 - Discuss four ways decision making is bounded: willpowers, self-interest, ethicality, awareness
 - Make a Deal: Ask for two volunteers. Have 10 pieces of candy. The rules are person A gets the candy and decides how much to share with person B. Person B then decides if

he will take the deal. If he does, both walk away with the candy allotted. If person B doesn't like the deal no one gets candy. *If you do this a few times you might see different allotments and answers. If you do this only one time then, ask person B why they chose the way they did. Then ask person A why they chose the way they did.* Ask about alternatives. Why would B say no; isn't some candy better than no candy?

- In what ways were you bounded by your decision-making? Did you go through the six steps of rational decision-making? Why not? What if it was hundred dollar bills instead of candy?
- Fixing Decisions: Refer to PowerPoint slides for the following:
 - Talk about System 1 vs. System 2. Ask students for examples of decisions they have to make and which system would be best used for making each one.
 - Talk about changing the environment to help people make better decisions. Talk about ethical concerns that may come up here, such as who is deciding what the "best" default decision is.

Activities & Demonstrations

The Monty Hall Dilemma: In-Class Activity

Kelley, M. R. (2004). Demonstrating the Monty Hall dilemma. *Teaching of Psychology* 31 (3) 193-195.

In this demonstration based off the TV game show *Let's Make a Deal*, hosted by Monty Hall (hence the name) students have to learn to trust the probability math rather than their own intuition to win the game. Even after the winning strategy (to switch) is explained to them, many students will continue to trust their intuition.

The basic premise of the activity is there are three "doors" (you can use images or cups) where one has a prize, the other two contain nothing or a nominal object. When first asked to pick a door there is a 33% chance of picking correctly. Then one of the other doors shows the nothing prize and the player is asked to stay or switch. Most of us will say that now there is a

50% chance of being right, so it doesn't matter. This activity proves us wrong in that assumption.

Materials

- 3 large (not clear) cups
- 1 prize object (a piece of candy) and optionally 2 nothing objects (two small rocks).

On the board or on students' paper, have them make a tally sheet, something like this:

Stay		Switch	
Win	Lose	Win	Lose

Instructions

- Ask for a student volunteer who will be the final choice maker. This student has to choose the first cup (1, 2, or 3). Then show one of the remaining rock cups. Now ask the student if he wants to stay or switch his choice.
- Tally the result then ask the student why they made that decision. You will most likely get an answer that the choice is now 50/50 so it's doesn't matter.
- Ask another student to come up and do the same thing.
- Tally and note if the student made the same choice to stay or switch and ask why.
- After a second trial explain the math to the students. It's actually better to switch because after the student chose there was a $\frac{1}{3}$ chance the prize is with the student and a $\frac{2}{3}$ chance the prize is not with the student. Knowing that one of the cups has a rock does not change the $\frac{2}{3}$ probabilities that the other cup has the prize (because there is a $\frac{2}{3}$ chance the student chose wrong initially).
- Students will probably argue with you, so do more trials. If you do and graph 20, you will see that switching provides more wins than staying.
- Some discussion topics for WHY students choose wrong are heuristics (trial and error), anchoring, and base rate neglect. Hopefully after this activity, students will also understand that, while it seems not to matter what choice is made, thinking through logically and

mathematically will lead to a better choice.

Make a Deal to Share

This activity is good to show how our decisions can be bounded by self-interest. Does Person A choose to share fairly or unfairly? Does Person B act in self-interest and take what is offered (better than nothing) or reject the deal (rather both get nothing to hurt you)?

Materials Life savers or other small candy

Instructions

- Ask for two volunteers. Give 10 pieces of candy to Person A. Person A decides how much to share with Person B. A splits with B. At this point give no other information.
- Then tell Person B she gets to decide if she will accept the deal. If she does, both walk away with the candy allotted. But B also has the option to reject the deal, both walking away with nothing.
- Person B makes a decision. *Then ask person B why she chose the way she did. Then ask person A why he chose the way he did.*
- What about self-interest? Personal gain vs. causing harm.
- Do the activity a second time. Does A choose differently knowing the rules? Does B?
- If you do more trials (with new participants each time) Keep track of the divisions and decisions.
- At the end, discuss the different options that were presented and how people decided. Were the decisions rational?
 - This activity is loosely based on the Prisoner's Dilemma
 - Rapoport, A. (1965). *Prisoner's dilemma: A study in conflict and cooperation* (Vol. 165). University of Michigan Press.
 - http://en.wikipedia.org/wiki/Prisoner's_dilemma
 - Alternative activity: Prisoner's Dilemma for Second Graders <http://boards.straightdope.com/sdmb/showthread.php?t=565425>

Alternate Monty Hall Dilemma

DiBattista, D. (2011). Evaluation of a digital learning object for the Monty Hall dilemma. *Teaching of Psychology* 38(1) 53-59 doi:10.1177/0098628310390916

David DiBattista developed a digital learning module of the Monty Hall dilemma, found here: <http://www.brocku.ca/psychology/people/dibattista.htm>. This online module has a learning component and a game component where students can play the classic 3-door version or a more complex 20-door version of the game. Both versions give an explanation as to the probability and allow students to play for as many trials as they want in order to understand why their intuition may lead them to the wrong answer and why understanding of probability may be false. This would make a great homework or extra credit assignment.

Additional Activities

Thompson, W. B., Vermette, P. J., & Wisniewski, S. A., (2004). Ten cooperative learning activities for the cognitive psychology course. *Teaching of Psychology*, 31 (2) 134-136.

- This gives 10 short activities for decision-making and problem solving. Some of these are primarily to introduce content and others to follow-up and reinforce. One activity below:
- *Decision-Making Heuristics*: Within their teams, students described a major life decision (e. g., college choice), then speculated how specific decision-making heuristics (e.g., representativeness), a concept that they had just studied, may have affected their decisions.

Alternative: Prisoner's Dilemma for Second Graders <http://boards.straightdope.com/sdmb-/showthread.php...>

- A way to play the prisoners dilemma with red and yellow (plastic) chips. This is written to work in a class of second graders, but works well for college age too. If students are able to pair up and do several trials to see what different scenarios get them, they can come up with what the most rational decision is (to get the most points) but also understand that decisions are often emotional.

Supplementary Material

Video: The Monty Hall Dilemma was featured in an episode of the TV show Numb3rs.

Episode 113 "Manhunt" This is a clip of the segment from YouTube.

<http://www.youtube.com/watch?v=bbCM8w18h-Q>

Outside Resources

Book: Bazerman, M. H., & Moore, D. (2013). Judgment in managerial decision making (8th ed.). John Wiley & Sons Inc.

Book: Kahneman, D. (2011) Thinking, Fast and Slow. New York, NY: Farrar, Straus and Giroux.

Book: Thaler, R. H., & Sunstein, C. R. (2008). Nudge: Improving Decisions about Health, Wealth, and Happiness. New Haven, CT: Yale University Press.

Evidence-Based Teaching

Stewart, A. C., Williams, J., Smith Gratto, K., Black, S., & Kane, B. (2011). Examining the impact of pedagogy on student application of learning: Acquiring, sharing, and using knowledge for organizational decision making. *Decision Sciences Journal Of Innovative Education*, 9(1), 3-26. doi:10.1111/j.1540-4609.2010.00288.x

- This study compares two leadership training programs to evaluate their effectiveness for leadership and decision making skills. The technical learning program was associated with information acquisition. The game based training was associated with better decision-making.

Suggestions from the Society for Teaching's Introductory Psychology Primer

POSSIBLE ASSESSMENTS (In or Out of Class) Ask students to identify times when they have made one of the following mistakes: representativeness bias, availability bias, overconfidence bias (or any others you cover). Have them write a brief essay explaining the mistake and how it is an example of the concept. (LO 1.2a, 3.1e) Ask students to draw a conceptual map of the

material in the module. Have them develop a hierarchical organization to the material representing their understanding of the concepts involved. (LO 1.3c)

ACTIVITIES & TECHNIQUES

Overconfidence Activity: Select some word puzzles (e.g., <http://thinks.com/brainteasers/index.htm>). Pick ones that are easy to present (e.g., only visual display). Show several and quickly give students the answers. Ask them how long it would take them to solve one. Then present a novel problem (without the solution) and time how long it takes students to complete it. Students usually will believe the novel problem will be easy to solve and they will be able to do it quickly, demonstrating overconfidence. It is a fun way to demonstrate the concepts. (LO 3.1e) Thinker (available at <http://cat.xula.edu/thinker/decisions/heuristics/ranking>) has a variety of web-based demonstrations of common decision making errors, including the representativeness heuristic, the availability heuristic, framing effects, and the gambler's fallacy. Great for critical thinking development. Select interactive demonstrations that expand upon static concepts from the book. (LO 3.1e) Functional Fixedness Activity (taken from Myers, 2007): Ask students to arrange six matchsticks so that they form three equilateral triangles. You may do it as a thought exercise, or actually provide your students with some sticks. Most students will be fixated on two-dimensional solutions. The only way to answer the problem is to create a three-dimensional pyramid. Also a fun way to demonstrate the concept. (LO 3.1e, 5.2) 46

Links to ToPIX Materials

Activities, demonstrations, handouts, etc.:

<http://topix.teachpsych.org/w/page/19980978/Cognition%20in%20the%20Classroom>

Thinking-Language Intelligence In the News:

<http://topix.teachpsych.org/w/page/26682121/Cognition%20in%20the%20News>

Video, Books, and Film:

<http://topix.teachpsych.org/w/page/39237027/>

Video:

<http://topix.teachpsych.org/w/page/19980979/Cognition%20>

Teaching Topics

Teaching The Most Important Course

http://nobaproject.com/documents/1_Teaching_The_Most_Important_Course.pdf

Content Coverage

http://nobaproject.com/documents/2_Content_Coverage.pdf

Motivating Students

http://nobaproject.com/documents/3_Motivating_Students_Tips.pdf

Engaging Large Classes

http://nobaproject.com/documents/4_Engaging_Large_Classes.pdf

Assessment Learning

http://nobaproject.com/documents/5_Assessment_Learning.pdf

Teaching Biological Psychology

http://nobaproject.com/documents/6_Teaching_Bio_Psych.pdf

PowerPoint Presentation

This module has an associated PowerPoint presentation. Download it at

http://nobaproject.com//images/shared/supplement_editions/000/000/123/Judgement%20and%20Decision%20Making.ppt?1416598980.

About Noba

The Diener Education Fund (DEF) is a non-profit organization founded with the mission of re-inventing higher education to serve the changing needs of students and professors. The initial focus of the DEF is on making information, especially of the type found in textbooks, widely available to people of all backgrounds. This mission is embodied in the Noba project.

Noba is an open and free online platform that provides high-quality, flexibly structured textbooks and educational materials. The goals of Noba are three-fold:

- To reduce financial burden on students by providing access to free educational content
- To provide instructors with a platform to customize educational content to better suit their curriculum
- To present material written by a collection of experts and authorities in the field

The Diener Education Fund is co-founded by Drs. Ed and Carol Diener. Ed is the Joseph Smiley Distinguished Professor of Psychology (Emeritus) at the University of Illinois. Carol Diener is the former director of the Mental Health Worker and the Juvenile Justice Programs at the University of Illinois. Both Ed and Carol are award- winning university teachers.

Acknowledgements

The Diener Education Fund would like to acknowledge the following individuals and companies for their contribution to the Noba Project: The staff of Positive Acorn, including Robert Biswas-Diener as managing editor and Peter Lindberg as Project Manager; The Other Firm for user experience design and web development; Sockeye Creative for their work on brand and identity development; Arthur Mount for illustrations; Chad Hurst for photography; EEI Communications for manuscript proofreading; Marissa Diener, Shigehiro Oishi, Daniel Simons, Robert Levine, Lorin Lachs and Thomas Sander for their feedback and suggestions in the early stages of the project.

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R. Biswas-Diener & E. Diener (Eds), Noba Textbook Series: Psychology. Champaign, IL: DEF Publishers. DOI: nobaproject.com



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