1 Value determination

✓Single attribute value
- Utility (a la expected utility theory & prospect theory)
  - Only affected by reference point and framing
- It's all relative - Alternatives matter
- Mere exposure effect

✓Multi-attribute value
- Normative methods
  - Componential context model
- Heuristics

✓A "new" approach - purely heuristic (Gigerenzer & Brunswik)

2 It's all relative

✓Items are valued in a particular context
- Items are compared to already-experienced items to determine their value (see later discussion of complex value).
  - The general form of Festinger's (1954) social comparison theory.
- Items are compared to visible alternatives
  - Earlier discussion of decoy effect.

3 Mere exposure effect

✓Familiar items are judged to be more liked than novel items (Zajonc, 1968).
- Familiarity does *not* necessarily breed contempt.
- *Mere* exposure increases value.
  - This is the principle behind advertising.
- This effect occurs even when the exposure is unconscious (and is stronger…)

4 Affective judgment without recognition

✓Kunst-Wilson & Zajonc (1980)
- Presented octagons during initial phase (mere exposure phase) at durations of 1 ms.
- Judgment phase - shown pairs of octagons.
  - Which one do you like better?
  - Which one did you see earlier?
- Had definite preference for unrecognized but repeated octagons (~ 65% vs. 35%).

5 Mere exposure? The role of complexity

✓Cox and Cox (2002)
- Used two types of stimuli, visually complex and visually simple (fashionable dresses).
  - Initially, simple designs liked more (4.2 vs. 3.2, 7-pt scale).
- With exposure, complex designs increase (4.3).
- With exposure, simple designs decrease (3.6)

✓Berlyne's (1970) hypothesis
- Complex stimuli are initially too complex, but exposure increases familiarity.
- But, repetition of simple stimuli creates boredom.
- Hypothesized an *optimum stimulation level*.

6 When *does* familiarity breed contempt?

✓Norton, Frost, and Ariely (2007) report circumstances involving the *judgment of people* (on-line

dating simulation and real data).

- With exposure, dates were judged less liked. Why?

✓Exposure involved *acquiring new information* about the person.

✓Liking was based on perceived similarity between self and other - new information made judge aware of *differences*.

- So, ambiguity was a good thing. Be mysterious!

7 Multi-attribute value

✓Many choice situations involve multiple attributes

- *Computer*: quality, cost, RAM, disk size, video-RAM, quality of support, warranty, etc.
- *Mate*: cleanliness, personality, facial attractiveness, body, earning potential, family.

✓How is all of this information weighted and integrated?

- Theories like prospect theory are silent about multi-attribute situations.

8 Two classes of methods

✓Normative

✓Heuristics

9 Normative methods

✓These methods are *exhaustive* and consider all of the alternatives and attributes.

✓Multi-attribute utility theory (MAUT)

- Weight all attributes by their importance.
- Consider each alternative one at a time and calculate a "global utility"
  - GU = attribute 1 * weight1 + attribute 2 * weight 2 + ….
- Choose the option with the highest global utility.

10 Normative methods, cont.

✓Additive difference method

- Compare two alternatives at a time.
- Compare attribute-by-attribute - estimate the difference between the alternatives.
- Sum up all of the differences to create an overall difference score.
- Keep the winner of this comparison and compare with another alternative.
- Continue until only one winner left.

11 Componential context model (Tversky & Simonson, 1993)

✓Recall the effect of less preferred alternatives on decision making?

✓This model allows for the components or attributes to change in importance as a function of context.

✓Consequence

- Losses in the value of one attribute can loom larger than gains in the value of another
- For example - losing one feature can have bigger impact than gaining new feature.

12 Heuristics

✓Elimination by aspects (Tversky, 1972)

- Pick the most important attribute and set a cutoff "acceptability" level for that attribute.
- Throw out all alternatives that don't meet level.
- Pick second most important attribute and do same thing for remaining options.
- Continue until one left.
- *Not guaranteed to find best overall alternative, it's somewhat time consuming, but it does get used by some people.*

13 ❑ Heuristics, cont.

✓Recognition heuristic (Gigerenzer)

- Easy to do
  - Earlier examples
  - Brand name shopping
- *Not guaranteed to find best overall alternative, but does surprisingly well in many cases.*
- Mere exposure effect…

14 ❑ Heuristics, cont.

✓Disjunctive heuristic

- Set "acceptability" cutoff points for the important attributes
- Look for first alternative that it as least as good as the cutoff value on ANY attribute.
- *Tends to select a heterogeneous subset of "specialists."*

✓There are many other heuristics that are used by people.

15 ❑ Evaluation of complex decision making

✓MAUT (and additive difference) produces best decisions

- But, Payne, Bettman, & Johnson (1993) found that many heuristics performed nearly as well.

✓McAllister, Mitchell, & Beach (1979) found that when the chooser was more "accountable" they tended toward the more normative methods.

16 ❑ Evaluation, cont.

✓The use of heuristics is susceptible to order and context effects.

✓Some alternatives don't have readily "separable" attributes

- For example, color choice for painting a room.
  - Hue, brightness, and saturation.
- Non-separable attributes ("integral" attributes) can't be differentially weighted or considered.
  - Requires a holistic judgment.

17 ❑ Gigerenzer's satisficing

✓Proposal

- The mind is not computing intricate probabilities and utilities
- The mind is able to reach into an "adaptive toolbox" filled with *fast and frugal heuristics*.
- Value is *heuristically* driven.

18 ❑ Perspectives on rationality

✓Unbounded rationality

- E.g., optimization under constraints

✓Bounded rationality

19 ❑ Unbounded rationality

✓No regard for constraints of time, knowledge, or computational capacity on human decision making.

✓Traditionally modeled by probability theory

- Encompasses expected utility theory

✓At best, it's a normative model; at worst, it's a poor descriptor of how people make decisions.

20 Optimization under constraints

✓Considers constraints

✓Adopts a "stopping rule" to constrain the search process.

- This optimizes the search for the right decision or best solution given the constraints

✓Problem

- The optimization process also requires considerable resources!

21 Example: Approximating expected value of a lottery ticket

✓1. Determine how much time you have.

✓2. Identify the amount of knowledge you have about probability theory and mathematics.

✓3. Identify how much you can keep in memory at once.

✓4. Determine the number of values you can compute in the time available and the amount of rounding necessary (memory limits).

✓5. NOW compute given the above limitations.

22 Example 2

23 Bounded rationality

✓Two components

- The limitations of the human mind
- The structure of the environment

✓Consequences

- Humans must use approximate methods to handle most tasks because of our limitations.
- But, the best methods are determined by the structure of the environment

24 Gigerenzer's observations

✓People tend to use dumb heuristics that are not optimal or even 'coherent' but *work.*

- These heuristics tap into cues that have some validity in the real environment.
- But, their use may seem stupid from a more analytical perspective.

25 Example 1: Identifying the relative populations of cities

26 Method 1 - a poor heuristic

✓Those starting with a letter near the beginning of the alphabet are bigger.

✓Easy to compute, but not valid.

27 Method 2 - a good heuristic: The ***recognition heuristic***

✓Cities which you have heard a lot about are bigger than those you haven't heard much about.

✓Easy to compute, surprising validity.

28 Data

✓ Gigerenzer & Goldstein (1996) quizzed Americans about pairs of 25 major German cities and 25 American cities

✓ *Which is bigger?*

- Americans cities
  - *Correct: 70% of the time*
- German cities
  - *Correct: 73% of the time!*

✓ Why?

29 ❑ Example 2: Predicting the stock market

✓ Borges et al. (1999)

✓ Examined stock recognition and performance

- Germans and Americans
- Laypeople and experts

30 ❑ Notion: A beneficial level of ignorance

✓ Experts can't use the recognition heuristic because they recognize nearly everything.

✓ Recognition heuristic less useful for domestic stocks (own country) than international stocks.

31 ❑ Predictions

✓ Laypeople will do better than experts with the recognition heuristic

✓ People will do better with international stocks than with domestic stocks with the recognition heuristic

- Note: I'll only talk about the Americans in the study.

32 ❑ Results: American stocks

✓ Americans using the recognition heuristic **underperformed** the stock market index for American stocks.

- *8% less than index (index returned 24% during the period).*

33 ❑ Results: German stocks

✓ Americans using the recognition heuristic **overperformed** the stock market index for German companies.

- *33% more than index (index was 32% during the period).*

34 ❑ Results: Laypeople outperformed the experts

✓ Laypeople, who only pick stocks that are highly recognizable, netted 5-10% higher returns than the experts did.

35 ❑ So, with enough ignorance one can outperform stock indices

✓ Note: some indices only include the major, recognizable companies.

✓ Too much ignorance (dart-board choice) does poorly.

36 ❑ How can so little information do so well?

✓ Consideration of irrelevant or nearly irrelevant information undermines decision

making process.

✓You start to pay attention to the small stuff and sacrifice attention to the big, important issues.

37 Leon Brunswik's perspective

✓Two issues

- Validity of the chosen attributes (the structure of the world)
- Use of these attributes by the decision maker (human limitations or error)
- Goal: use attributes based on their validity

✓Performance is limited by validity of cues

- Perfect (or even good) performance may not be obtainable!

38 Brunswik's Lens Model

✓Conceptualizes the process as 'seeing the world through a lens'

- Is your lens in focus so that you are getting a realistic picture of the world?
- Rose-colored glasses?

✓Brunswik wanted to analyze properties of the world, not just the organism:

- "psychology has forgotten that it is a science of organism-environment relationships and has become a science of the organism" (Brunswik, 1957, p. 6)

39 Lens Model

40 Lack of selectivity: The *dilution effect*

41 Dilution effect, cont.

✓Linking diagnostic with nondiagnostic information produces regressive judgments.

- Example: people drew strong inferences about the likely GPA of a student given studying habits, but moderated their predictions on receiving irrelevant information (e.g., the number of plants the student kept). (Nisbett, Zukier, and Lemley, 1981).

✓Documented in medical practice (Rakow et al., 2005) and auditing (Hackenbrack, 1992) *inter alia*.

✓Dilution effect is often *worse* when people are held accountable (Tetlock & Boettger, 1989).

42 Evaluation of heuristic perspective

✓Fast and frugal heuristics do a remarkably good job describing people's behavior under many circumstances.

- People quite likely do use some of these simple heuristics in their judgment of value and subsequent decision making.

✓Approach is clearly not normative.

✓Approach has too many degrees of freedom

- Too many tools in the toolbox?

✓No general formalization.