Decision Making

The psychology of choice

Assumptions of Neoclassical Economics ("*Homo Economicus*")

- Selfishness – an individual chooses on the basis of his/her own interests (no true, systematic altruism)
- Stable, exogenous preferences – what the individual wants is well-defined, available to introspection, and stable over time
- Formal rationality – an individual's preferences, tastes, etc. are consistent with each other

Rational Choice Theories for Individuals

- Utility theory – one agent, choice depends only on states of nature

Example: A decision that depends on states of nature

- Options:
  - Plan picnic outdoors
  - Plan picnic indoors
- Possible states of nature
  - Rain
  - No rain
- Choice depends on likelihood of rain, relative quality of picnic indoors/outdoors with and without rain

Rational Choice Theories for Individuals (Von Neumann and Morgenstern, 1944)

- Utility theory – one agent, choice depends only on states of nature

- Game theory – more than one agent, choice depends on what other agents may choose

Example: a decision that depends on what others may do

- Options:
  - Go to the beach
  - Go to the cinema
- Your friend may choose to:
  - Go to the beach
  - Go to the cinema
- You cannot control or know what your friend will do
- Both of you know each other's preferences
- Choice depends on what you think your friend will do, which depends on what s/he thinks you will do, and so on…

Expected Utility Theory – Crucial Features

- Utility ("degree of liking") is defined by (revealed) preferences
  - i.e. U(A) > U(B) iff A is preferred to (chosen over) B

Expected Utility Theory – Crucial Features

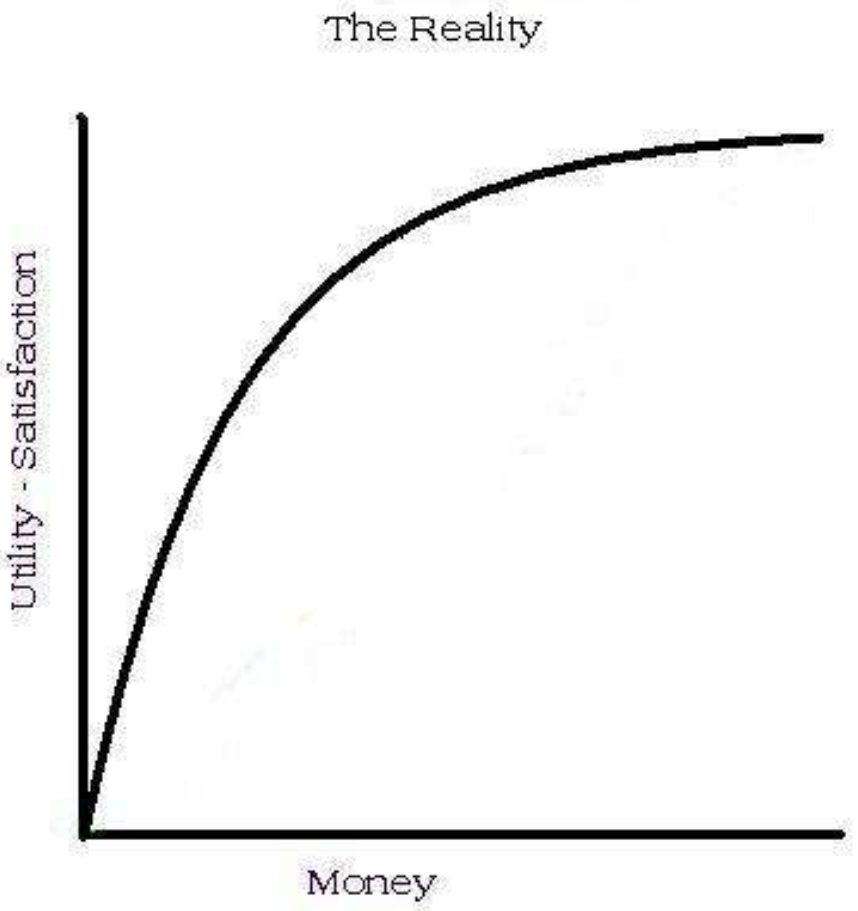
- Utility ("degree of liking") is defined by (revealed) preferences
  - i.e. U(A) > U(B) iff A is preferred to (chosen over) B
- Preferences are well ordered
  - i.e. transitive: If A ? B and B ? C, then A ? C

Expected Utility Theory – Crucial Features

- Utility ("degree of liking") is defined by (revealed) preferences
  - i.e. U(A) > U(B) iff A is preferred to (chosen over) B
- Preferences are well ordered
  - i.e. transitive: If A ? B and B ? C, then A ? C
- Choices under uncertainty are determined by *expected utility*
  - Expected utility is a probability-weighted combination of the utilities of all *n* possible outcomes O_i

$$\sum_{i=1}^{n} U(O_i)P(O_i)$$

A Concave Utility Curve



Example: Application of Utility Theory

- Options:
  - Gamble (50% chance to win $100; else $0)
  - Sure Thing (100% chance to win $50)
- Expected *values* are the same:
  - EV(Gamble) = (.5)($100) + (.5)($0) = $50
  - EV(Sure Thing) = (1)($50) = $50
- But their expected *utilities* may still differ
  - EU(Gamble) = .5U($100) + .5U($0)
  - EU(Sure Thing) = U($50)

Expected utility theory says that utilities are…

- Not directly observable (internal to an individual)
- Not comparable across individuals
- Constrained by revealed preferences (i.e. choices between gambles)

- Note: Anderson gets the relationship between utility and value wrong

Do people's choices obey the theory of expected utility (i.e., formal rationality)?

Expected Utility Theory – Crucial Features

- Utility ("degree of liking") is defined by (revealed) preferences
  - i.e. U(A) > U(B) iff A is preferred to (chosen over) B

Utility versus Preference (Lichtenstein and Slovic, 1971; 1973)

- Ps given two options:
  - P bet: 29/36 probability to win $2
  - $ bet: 7/36 probability to win $9
- Two conditions:
  - Choose one: Most prefer P bet
  - Value the bets: Most value $ bet higher
- Shows utility (based on cash value) is not consistent with revealed preference

Expected Utility Theory – Crucial Features

- Utility ("degree of liking") is defined by (revealed) preferences
  - i.e. U(A) > U(B) iff A is preferred to (chosen over) B
  - Contradicted by preference reversal

Expected Utility Theory – Crucial Features

- Utility ("degree of liking") is defined by (revealed) preferences
  - i.e. U(A) > U(B) iff A is preferred to (chosen over) B
  - Contradicted by preference reversal
- Preferences are well ordered
  - i.e. transitive: If A ? B and B ? C, then A ? C

Tests of Transitivity (A. Tversky, 1969)

- Ps shown ratings of college applicants on three dimensions:

Applicant	Intelligence	Stability	Social
A	69	84	75
B	72	78	65
C	75	72	55
D	78	66	45
E	81	60	35

- **Ps chose A over B, B over C, C over D, D over E, but……E over A (difference in intelligence outweighed)**

Expected Utility Theory – Crucial Features

- Utility ("degree of liking") is defined by (revealed) preferences
  - i.e. U(A) > U(B) iff A is preferred to (chosen over) B
  - Contradicted by preference reversal
- Preferences are well ordered
  - i.e. transitive: If A ? B and B ? C, then A ? C
  - Contradicted by three-option intransitivities (and preference reversals)

Expected Utility Theory – Crucial Features

- Utility ("degree of liking") is defined by (revealed) preferences
  - i.e. U(A) > U(B) iff A is preferred to (chosen over) B
  - Contradicted by preference reversals
- Preferences are well ordered
  - i.e. transitive: If A ? B and B ? C, then A ? C
  - Contradicted by three-option intransitivities (and preference reversals)
- Choices under uncertainty are determined by *expected utility*
  - Expected utility is a probability-weighted combination of the utilities of all *n* possible outcomes O_i

$$\sum_{i=1}^{n} U(O_i)P(O_i)$$

Testing Expected Utility (Tversky and Kahneman, 1981)

- Choose between
  - A. Sure win of $30
  - B. 80% chance to win $45

Testing Expected Utility (Tversky and Kahneman, 1981)

- Choose between:
  - A. Sure win of $30
  - B. 80% chance to win $45
- Choose between:
  - C. 25% chance to win $30
  - D. 20% chance to win $45

Testing Expected Utility (Tversky and Kahneman, 1981)

- Choose between:
  - A. Sure win of $30 [78 percent]
  - B. 80% chance to win $45 [22 percent]
- Choose between:
  - C. 25% chance to win $30 [42 percent]
  - D. 20% chance to win $45 [58 percent]

Testing Expected Utility (Tversky and Kahneman, 1981)

- Choose between:
  - A. Sure win of $30 [78 percent]
  - B. 80% chance to win $45 [22 percent]
- Choose between:
  - C. 25% chance to win $30 [42 percent]
  - D. 20% chance to win $45 [58 percent]
- But this pattern is inconsistent with EUT:
  - EU(A)>EU(B) => u($30)>.8u($45)
  - EU(D)>EU(C) => .25u($30)<.2u($45)
  - Multiply both sides of bottom inequality by 4: contradicts top inequality

Testing Expected Utility (Tversky and Kahneman, 1981)

- Choose between:
  - A. Sure win of $30 [78 percent]
  - B. 80% chance to win $45 [22 percent]
- Choose between:
  - C. 25% chance to win $30 [42 percent]
  - D. 20% chance to win $45 [58 percent]
- But this pattern is inconsistent with EUT:
  - EU(A)>EU(B) => u($30)>.8u($45)
  - EU(D)>EU(C) => .25u($30)<.2u($45)
  - Multiply both sides of bottom inequality by 4: contradicts top inequality
- This is called a “certainty effect”: certain gains have extra psychological value

Expected Utility Theory – Crucial Features

- Utility ("degree of liking") is defined by (revealed) preferences
  - i.e. U(A) > U(B) iff A is preferred to (chosen over) B
  - Contradicted by preference reversals
- Preferences are well ordered
  - i.e. transitive: If A ? B and B ? C, then A ? C
  - Contradicted by three-option intransitivities (and preference reversals)
- Choices under uncertainty are determined by *expected utility*
  - Expected utility is a probability-weighted combination of the utilities of all *n* possible outcomes O_i
  - Contradicted by certainty effect

$$\sum_{i=1}^{n} U(O_i)P(O_i)$$

So, people's choices do not obey formal rationality.

Are their preferences nonetheless stable?

Neoclassical Assumptions About Preferences

- The chosen option in a decision problem should remain the same even if the surface description of the problem changes (descriptive invariance)

A Test of Descriptive Invariance (Tversky and Kahneman, 1981)

- Consider a two-stage game. In the first stage, there is a 75% chance to end the game without winning anything, and a 25% chance to move into the second stage. If you reach the second stage, you have a choice between
  - Sure win of $30
  - 80% chance to win $45
- Your choice must be made before the game starts, i.e. before the outcome of the first stage is known

A Test of Descriptive Invariance (Tversky and Kahneman, 1981)

- Consider a two-stage game. In the first stage, there is a 75% chance to end the game without winning anything, and a 25% chance to move into the second stage. If you reach the second stage, you have a choice between
  - Sure win of $30 [74 percent]
  - 80% chance to win $45 [26 percent]
- Your choice must be made before the game starts, i.e. before the outcome of the first stage is known

A Test of Descriptive Invariance (continued)

- But this gamble is formally identical to a problem we saw earlier, namely:
  - Choose between:
    - C. 25% chance to win $30 [42 percent]
    - D. 20% chance to win $45 [58 percent]

A Test of Descriptive Invariance (continued)

- But this gamble is formally identical to a problem we saw earlier, namely:
  - Choose between:
    - C. 25% chance to win $30 [42 percent]
    - D. 20% chance to win $45 [58 percent]
- Compare:
  - Consider a two-stage game. In the first stage, there is a 75% chance to end the game without winning anything, and a 25% chance to move into the second stage. If you reach the second stage, you have a choice between
    - Sure win of $30 [74 percent]
    - 80% chance to win $45 [26 percent]

A Test of Descriptive Invariance (continued)

- But this gamble is formally identical to a problem we saw earlier, namely:
  - Choose between:
    - C. 25% chance to win $30 [42 percent]
    - D. 20% chance to win $45 [58 percent]
- Compare:
  - Consider a two-stage game. In the first stage, there is a 75% chance to end the game without winning anything, and a 25% chance to move into the second stage. If you reach the second stage, you have a choice between
    - Sure win of $30 [74 percent]
    - 80% chance to win $45 [26 percent]
- A violation of descriptive invariance
- This is known as a "pseudo-certainty" effect: When a stage of the problem is presented as involving a certain gain, it carries extra weight even if getting to that stage is itself uncertain.

Framing Effects (Tversky and Kahneman, 1981)

- Problem 1: Imagine that the U.S. is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:
  - If Program A is adopted, 200 people will be saved **[72 percent]**
  - If Program B is adopted, there is 1/3 probability that 600 people will be saved, and 2/3 probability that no people will be saved. **[28 percent]**
- Problem 2:
  - If Program C is adopted 400 people will die **[22 percent]**
  - If Program D is adopted there is 1/3 probability that nobody will die, and 2/3 probability that 600 people will die. **[78 percent]**
- But the programs are identical! This example also violates descriptive invariance.
- Shows *reflection effect*: Risk aversion in the domain of gains; risk seeking in the domain of losses

Neoclassical Assumptions About Preferences

- The chosen option in a decision problem should remain the same even if the surface description of the problem changes (descriptive invariance)
  - Contradicted by pseudo-certainty and framing effects

Neoclassical Assumptions About Preferences

- The chosen option in a decision problem should remain the same even if the surface description of the problem changes (descriptive invariance)
  - Contradicted by pseudo-certainty and framing effects
- The chosen option should depend only on the outcomes that will obtain after the decision is made, not on differences between those outcomes and
  - the status quo
  - what one expects
  - the overall magnitude of the decision

Status Quo Bias (Kahnemen, Knetsch, and Thaler, 1990)

- “Sellers” each given coffee mug, asked how much they would sell if for
- “Buyers” not given mug, asked how much they would pay for one
- Median values:
  - Sellers: $7.12
  - Buyers: $2.87

Status Quo Bias (Kahnemen, Knetsch, and Thaler, 1990)

- "Sellers" each given coffee mug, asked how much they would sell if for
- "Buyers" not given mug, asked how much they would pay for one
- Median values:
  - Sellers: $7.12
  - Buyers: $2.87
- "Choosers" asked to choose between mug and cash – preferred mug if cash amount was $3.12 or lower, on average
- Shows "endowment effect" – we value what we have; and "loss aversion" – we don't want to lose it

Mental accounts and expectations (Tversky and Kahneman, 1981)

- Imagine that you have decided to see a play where admission is $20 per ticket. As you enter the theater you discover that you have lost the ticket. The seat was not marked and the ticket cannot be recovered. Would you pay $20 for another ticket?

Mental accounts and expectations (Tversky and Kahneman, 1981)

- Imagine that you have decided to see a play where admission is $20 per ticket. As you enter the theater you discover that you have lost the ticket. The seat was not marked and the ticket cannot be recovered. Would you pay $20 for another ticket?

Mental accounts and expectations (Tversky and Kahneman, 1981)

- Imagine that you have decided to see a play where admission is $20 per ticket. As you enter the theater you discover that you have lost ***a $20 bill***. Would you still pay $20 for a ticket to the play?

Mental accounts and expectations (Tversky and Kahneman, 1981)

- Imagine that you have decided to see a play where admission is $20 per ticket. As you enter the theater you discover that you have lost the ticket. The seat was not marked and the ticket cannot be recovered. Would you pay $20 for another ticket? **[No: 54%]**
- Imagine that you have decided to see a play where admission is $20 per ticket. As you enter the theater you discover that you have lost ***a $20 bill***. Would you still pay $20 for a ticket to the play? **[Yes: 88%]**
- But in both problems, the final outcome is the same if you buy the ticket: you have the same amount of money and you see the play. Why should these cases differ?

Dependence on Ratios (Tversky and Kahneman, 1981)

- Imagine that you are about to purchase a jacket for $250, and a calculator for $30. The calculator salesman informs you that the calculator [jacket] you wish to buy is on sale for $20 [$240] at the other branch of the store, located 20 minutes drive away. Would you make the trip to the other store?
- Results:
  - 68% willing to make extra trip for $30 calculator
  - 29% willing to make extra trip for $250 jacket
- Note: save same amount in both cases: $10. Why the discrepency?

Neoclassical Assumptions About Preferences

- The chosen option in a decision problem should remain the same even if the surface description of the problem changes (descriptive invariance)
  - Contradicted by pseudo-certainty and framing effects
- The chosen option should depend only on the outcomes that will obtain after the decision is made, not on differences between those outcomes and
  - the status quo: Contradicted by endowment effect
  - what one expects: Contradicted by mental accounts
  - the overall magnitude of the decision: Contradicted by ratio effect

More Neoclassical Assumptions About Preferences

- Preferences over future options should not depend on the transient emotional state of the decision maker at the time of the choice (state independence)

Endowment Effect Revisited (Van Boven, Dunning, and Loewenstein, 2000)

- Replicated coffee mug endowment effect
  - Avg. selling price: $6.37
  - Avg. buying price: $1.85
- Sellers [Buyers] asked to estimate how much buyers [sellers] would pay, and rewarded for accurate predictions
  - Sellers' estimate of buying price: $3.93
  - Buyers' estimate of selling price: $4.39
- Result shows "projection bias": estimates are biased toward Ps emotional state at the time of estimate (attached or unattached to mug)
- Validated for predicting one's own selling price before owning a mug (Loewenstein & Adler, 1995)

Why you shouldn't shop on an empty stomach (Read & Van Leeuwen, 1998)

- Office workers choose between healthy and unhealthy snacks to be received in a week
- Decision times and projected snack reception times either when
  - hungry (late in afternoon)
  - satiated (right after lunch)
- Results: % choosing unhealthy snack:

		Future Hunger	
		Hungry	Satiated
Current Hunger	Hungry	78%	42%
	Satiated	56%	26%

More Neoclassical Assumptions About Preferences

- Preferences over future options should not depend on the transient emotional state of the decision maker at the time of the choice (state independence)
  - Contradicted by projection bias

More Neoclassical Assumptions About Preferences

- Preferences over future options should not depend on the transient emotional state of the decision maker at the time of the choice (state independence)
  - Contradicted by projection bias
- Preferences between future outcomes should not vary systematically as a function of the time until the outcomes (delay independence)

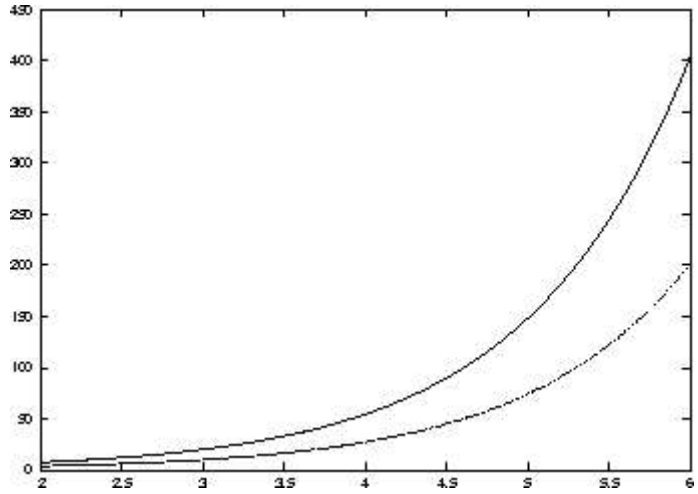
Testing Delay Independence (Ainslie and Haendel, 1983)

- Ps chose between two prizes to be paid by reputable company:
  - 1. $50 today versus $100 in 6 months
  - 2. $50 in 12 months versus $100 in 18 months

Testing Delay Independence (Ainslie and Haendel, 1983)

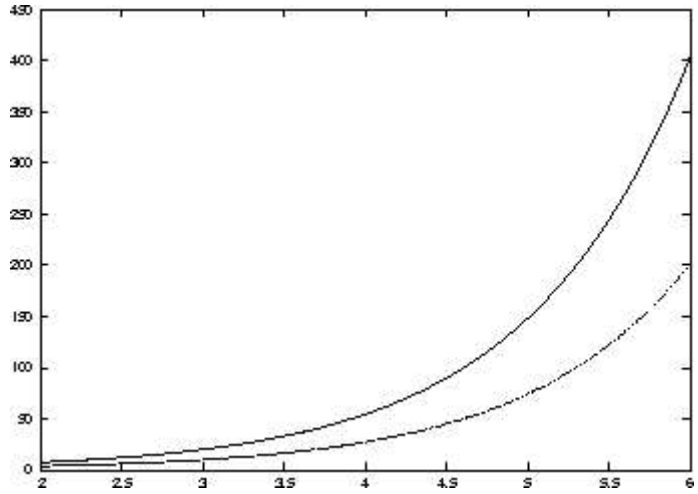
- Ps chose between two prizes to be paid by reputable company:
  - 1. $50 today versus $100 in 6 months
  - 2. $50 in 12 months versus $100 in 18 months
- Most chose $50 today in problem 1, but $100 in 18 months in problem 2
- Violates delay independence – illustrates hyperbolic discounting

Temporal Discounting

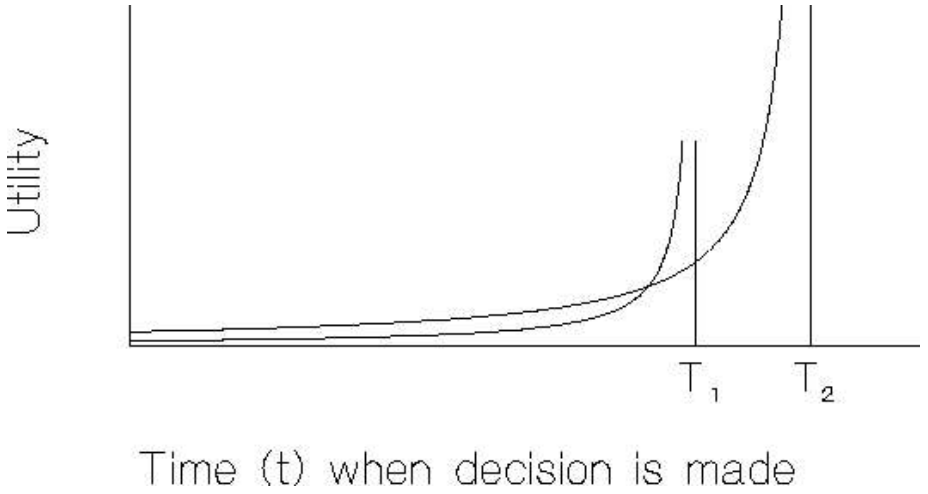


Normative Theory: exponential discounting
(constant discount rate)

Temporal Discounting



Normative Theory: exponential discounting (constant discount rate)



Descriptive Theory: hyperbolic discounting (temporal myopia/impulsiveness)

More Neoclassical Assumptions About Preferences

- Preferences over future options should not depend on the transient emotional state of the decision maker at the time of the choice (state independence)
  - Contradicted by projection bias
- Preferences between future outcomes should not vary systematically as a function of the time until the outcomes (delay independence)
  - Contradicted by hyperbolic discounting/impulsiveness

More Neoclassical Assumptions About Preferences

- Preferences over future options should not depend on the transient emotional state of the decision maker at the time of the choice (state independence)
  - Contradicted by projection bias
- Preferences between future outcomes should not vary systematically as a function of the time until the outcomes (delay independence)
  - Contradicted by hyperbolic discounting/impulsiveness
- Experienced utility should not differ systematically from
  - decision utility
  - predicted utility
  - retrospective utility

The Harvard/Yale Assistant Professor's Problem (Anecdotal)

- Harvard and Yale grant tenure to very few junior faculty
- But prestige considerations often cause acceptance of job offers over schools more likely to grant tenure (e.g. Michigan)
- Result can be a miserable experience: drop in status, feeling of failure when assistant professorship is over
- Possibly an instance of decision utility (revealed by choice) being inconsistent with experienced (and even predicted) utility
- Anticipated by Adam Smith: people exaggerate importance of social status

Failures of Hedonic Prediction

- People neglect effects of adaptation to surroundings in predicting future utility
  - Misprediction, after initial (unpleasant) exposure, of (non) enjoyment of plain yogurt after 8 daily episodes of consumption (Kahneman & Snell, 1992)
  - Change in social comparison group (e.g. teaching at Harvard/Yale, moving to a new neighborhood)
  - Weariness with travel – planning overly long vacations, too much time at the beach
- Assistant professors overestimate effects of tenure decision on happiness one year later (Gilbert and Wilson, 2000)

A Test of Hedonic Memory (Kahneman et al., 1993)

- Ps given two unpleasant experiences:
  - Short trial: Hold hand in 14°C water for 60s
  - Long trial: Hold hand in water for 90s; 14°C for 60s, followed by gradual rise to 15°C over next 30s
- After second trial, Ps called in to repeat one of the two trials exactly
  - 65% chose to repeat the long trial
- Interpretation: “duration neglect” – people remember and overweight the end of the experience (a gradual decline in pain)

Application in Clinical Setting (Redelmeier and Kahneman, 1996)

- Patients undergoing colonoscopy reported intensity of pain every 60s
- Later provided several measures of remembered utility for the whole experience
- Remembered utility ratings reflected not total utility (addition of pain ratings) but a “peak and end” rule: highest and last pain ratings dominated memory
- Failure to integrate moment utilities: may account for difference in reported happiness between French and U.S. survey-takers

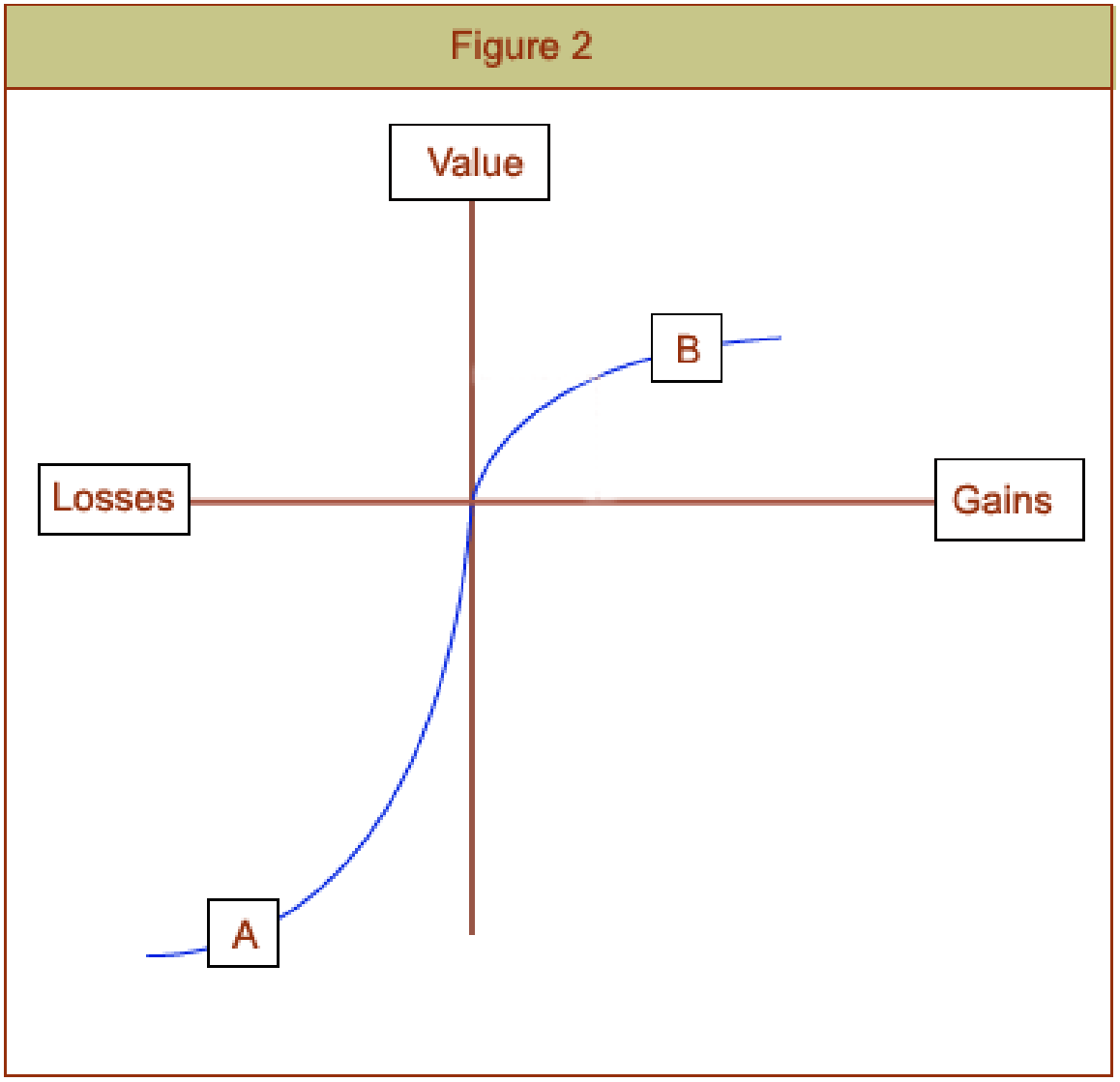
More Neoclassical Assumptions About Preferences

- Preferences over future options should not depend on the transient emotional state of the decision maker at the time of the choice (state independence)
  - Contradicted by projection bias
- Preferences between future outcomes should not vary systematically as a function of the time until the outcomes (delay independence)
  - Contradicted by impulsiveness
- Experienced utility should not differ systematically from
  - decision utility: Harvard/Yale junior faculty problem
  - predicted utility: Contradicted by failure to predict adaptation
  - retrospective utility: Contradicted by duration neglect and failure to integrate moment utilities

Prospect Theory (Kahneman and Tversky, 1979; 1992)

- Prospects are evaluated according to a value function that exhibits
  - reference dependence (subjectively oriented around a zero point, defining gains and losses)
  - diminishing sensitivity to differences as one moves away from the reference point
  - loss aversion: steeper for losses than for gains

The Value Function



Prospect Theory (Kahneman and Tversky, 1979; 1992)

- Prospects are evaluated according to a value function that exhibits
  - reference dependence (subjectively oriented around a zero point, defining gains and losses)
  - diminishing sensitivity to differences as one moves away from the reference point
  - loss aversion: steeper for losses than for gains
- Probabilities are transformed by a weighting function that exhibits diminished sensitivity to probability differences as one moves from either certainty (1.0) or impossibility (0.0) toward the middle of the probability scale (0.5)
  - Refinement of reflection effect: risk *aversion* for medium-to-high probability gains and low probability losses; risk *seeking* for medium to high probability losses and low probability gains

Some everyday, observed consequences of prospect theory (Camerer, 2000)

- Loss aversion:
  - Equity premium in stock market: stock returns too high relative to bond returns
  - Cab drivers quit around daily income target instead of “making hay while sun shines”
  - Most employees do not switch out of default health/benefit plans
  - People at quarter-based schools prefer quarters, at semester-based schools prefer semesters
- Reflection effect:
  - Horse racing: favorites underbet, longshots overbet (overweight low probability loss); switch to longshots at end of the day
  - People hold losing stocks too long, sell winners too early
  - Customers buy overpriced “phone wire” insurance (overweight low probability loss)
  - Lottery ticket sales go up as top prize rises (overweight low probability win)

More serious consequences

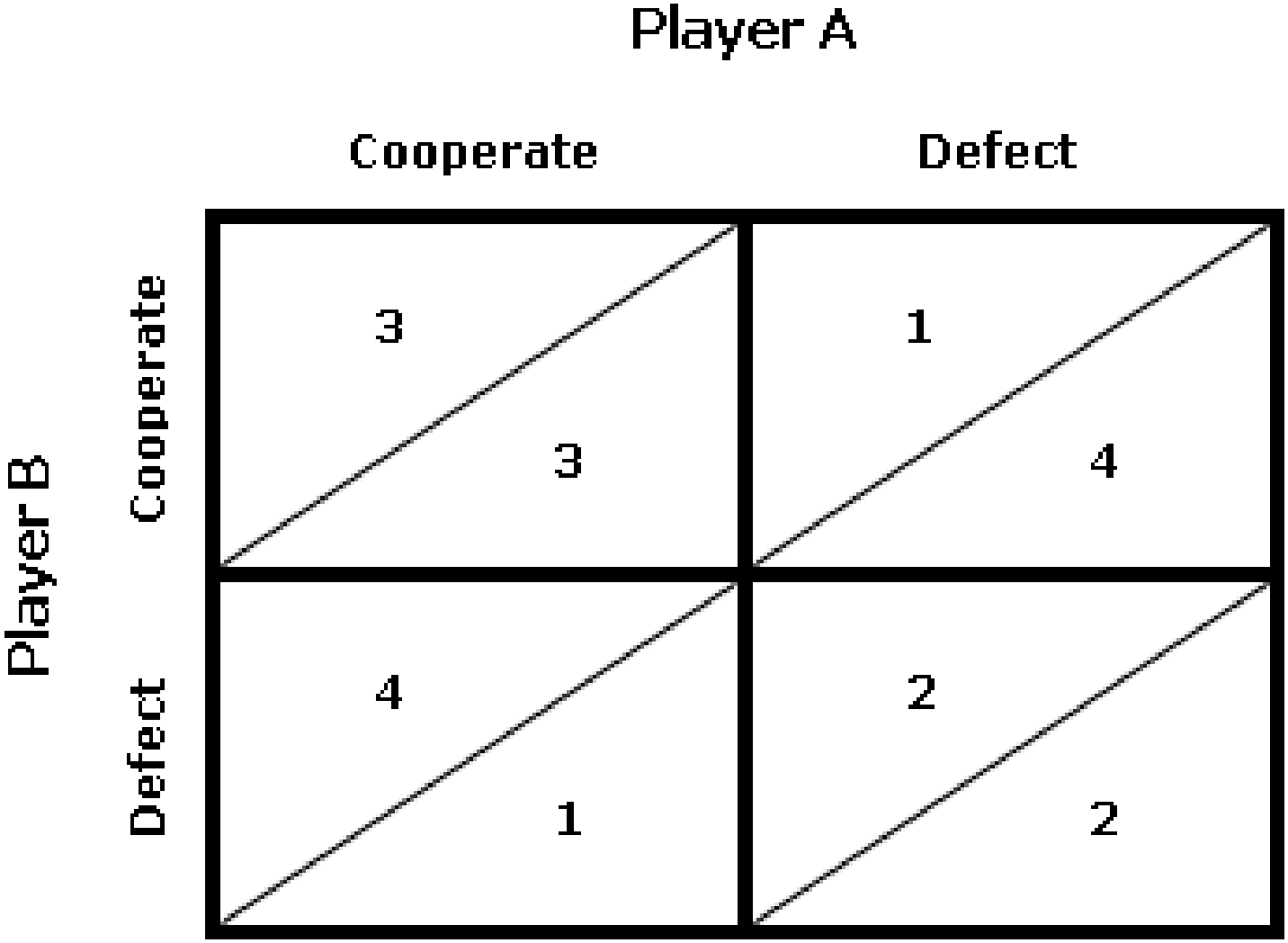
- Loss aversion makes individuals/societies unwilling to switch to healthier living (fear loss of income, unsustainable luxuries)
- Risk seeking for likely losses can cause prolonged pursuit of doomed policies, e.g. wars that are not likely to be won, choosing court trial instead of bargaining
- Risk seeking for unlikely gains can lead to excessive gambling in individuals, quixotic policies when leaders get too powerful

Okay, people are rational and don't have stable preferences, but aren't they at least basically selfish?

Self-Interest Assumption in Game Theory

- Choices in games should always reflect what is best for the decision maker, i.e. what will maximize the decision maker's payoff

Prisoner's Dilemma (Tucker, 1955)



Prisoner's Dilemma Labeling Experiment (Ross and Samuels, 1993)

- When PD is labeled the "Wall Street Game", only 1/3 cooperate
- When it is labeled the "Community Game", 2/3 cooperate
- Shows presence of both tendencies – defection and cooperation – which can be evoked by social signals

The Ultimatum Game (Guth et al., 1982)

- $100 in one dollar bills available to be divided between two players
- “Proposer” chooses a division
- “Receiver” can either
  - accept: both receive proposed amounts
  - reject: both receive nothing
- How much should the Proposer offer?

The Ultimatum Game (Guth et al., 1982)

- $10 in one dollar bills available to be divided between two players
- “Proposer” chooses a division
- “Receiver” can either
  - accept: both receive proposed amounts
  - reject: both receive nothing
- How much should the Proposer offer?

Ultimatum game experiment (Thaler, 1988)

- Most proposers offer $5 (even split), or a little less, to the receiver
  - altruism

- Low offers ($1) usually rejected
  - “altruistic punishment”

Dictator Game (Kahneman et al., 1986)

- One P (student in class) asked to divide $20 between self and other P. Other P has no choice to accept/reject.
- Two possibilities:
  - Even split ($10 each)
  - Uneven split ($18 for self, $2 for other)
- Game theory predicts uneven split
- 76% chose an even split

Ultimatum and Dictator Games in Traditional Societies (Henrich et al., 2001)

- Ps tested 15 small-scale societies
- Ultimatum game:
  - Mean offer varied from 0.26 to 0.58 (0.44 in industrial societies)
  - Rejection rate also quite varied: low offers rarely rejected in some groups, in others *high* offers are often rejected
- Great variation in behavior even among nearby groups; depends on deep aspects of culture, experience:
  - e.g. meat-sharing Ache (Paraguay) and village-minded Orma (Kenya) made generous offers, family-focused Machiguenga (Peru) showed low cooperation

Ultimatum and Dictator Games in Traditional Societies (Henrich et al., 2001)

- Ps tested 15 small-scale societies
- Ultimatum game:
  - Mean offer varied from 0.26 to 0.58 (0.44 in industrial societies)
  - Rejection rate also quite varied: low offers rarely rejected in some groups, in others *high* offers are often rejected
- Great variation in behavior even among nearby groups; depends on deep aspects of culture, experience:
  - e.g. meat-sharing Ache (Paraguay) and village-minded Orma (Kenya) made generous offers, family-focused Machiguenga (Peru) showed low cooperation
- General conclusion: there is no such thing as *homo economicus*; cooperation behavior is highly variable, heavily determined by cultural norms

Effects of a Norm of Self-Interest

- People describe involvement in social cause as being more self-interest motivated than it is (Miller, 1999)
- Voting behavior in U.S. becoming more self-interest-driven (McCarty, in press), may reflect shift toward greater norm of self-interest in politics
- Economic theories and language “can become self-fulfilling” (Ferraro, Pfeffer, and Sutton, 2003)

Finally…

- Cognitive psychology can inform many areas of research, theory, and practice that do not now properly incorporate its insights

- Theories about psychology, whether grounded in data or not, can have profound consequences for the way we live