Econ 219B
Psychology and Economics: Applications
(Lecture 7)

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March 3, 2004

Outline

1. Framing: Coherent Arbitrariness
2. Framing: General
3. Framing: Decisions under Risk
4. Framing: Examples

1 Framing: Coherent Arbitrariness

1.1 Housing markets

- Loewenstein-Simonsohn, 2002

- Individual A moves from Boston to Pittsburgh
- Individual B moves from Phoenix to Pittsburgh
- Who pays more for housing?
- Depends on previous anchor

- Issues with unobseved heterogeneity

Table 3

Housing Demand Estimations for Renters

Dependent Variable: log(dollar amount of monthly rent)							
	(1) Baseline	(2) Adds Costs in Previous City	(3) Adds Selection Adjustment	(4) Adds Fixed Effects	(5) Adds Relative Ex-penditure (t-1)	(6) Adds e(t-1)	(7) Excludes Housing Motivated Moves
constant	-0.631	-1.621	-1.376	-1.466	-1.260	-0.757	-1.853
	(0.606)	(0.697)	(0.705)	(0.712)	(0.908)	(1.223)	(0.785)
log(income)	0.284	0.284	0.252	0.254	0.248	0.232	0.294
	(0.029)	(0.029)	(0.030)	(0.030)	(0.045)	(0.074)	(0.039)
Number of children in household	0.044	0.045	0.040	0.040	0.053	0.062	0.056
	(0.017)	(0.017)	(0.017)	(0.018)	(0.020)	(0.021)	(0.018)
Number of adults in household	0.145	0.146	0.125	0.126	0.139	0.149	0.123
	(0.044)	(0.044)	(0.044)	(0.043)	(0.055)	(0.054)	(0.048)
Age of head of household	0.006	0.004	-0.001	0.001	0.006	0.003	0.000
	(0.007)	(0.007)	(0.007)	(0.007)	(0.011)	(0.010)	(0.009)
(Age squared)/100	-0.003	-0.002	0.001	-0.001	-0.680	-0.003	0.000
	(0.007)	(0.007)	(0.007)	(0.007)	(0.011)	(0.010)	(0.000)
Attended college (1 or 0)	0.131	0.132	0.116	0.119	0.108	0.137	0.117
	(0.036)	(0.036)	(0.036)	(0.036)	(0.042)	(0.041)	(0.039)
Head of household is female (1 or 0)	0.026	0.021	0.036	0.034	0.093	0.111	0.053
	(0.048)	(0.047)	(0.048)	(0.049)	(0.053)	(0.062)	(0.051)
log(median rent destination city)	0.536	0.494	0.527	0.537	0.421	0.427	0.550
	(0.083)	(0.087)	(0.085)	(0.085)	(0.097)	(0.103)	(0.093)
log(median rent origin city)	--	0.203	0.197	0.192	0.286	0.209	0.182
	--	(0.079)	(0.079)	(0.080)	(0.096)	(0.101)	(0.089)
Inverse of Mill's Ration	--	--	0.198	0.187	-0.046	0.214	0.089
	--	--	(0.061)	(0.076)	(0.219)	(0.263)	(0.080)
Rent to Median Ratio in t-1	--	--	--	--	0.188	--	--
	--	--	--	--	(0.045)	--	--
Residual from t-1	--	--	--	--	--	0.136	--
	--	--	--	--	--	(0.051)	--
Yearly Fixed Effects	no	no	no	yes	yes	yes	yes
Number of observations	646	646	646	646	461	461	490
R-square	29.88%	30.64%	31.55%	32.20%	34.67%	34.65%	35.09%

notes: Robust standard errors are presented below parameter estimates in parenthesis.

Table 4

Readjustment of Consumption on Year Following Inter-city Move

Dependent Variable:	(1) *Dlog(rent[t+1])* Baseline	(2) *Dlog(rent[t+1])* Adds (P*-P)	(3) *Dlog(rent[t+1])* Adds year fixed effects
Intercept	0.072	0.057	0.101
	(0.040)	(0.040)	(0.101)
Change in log(income)	0.199	0.170	0.157
	(0.075)	(0.076)	(0.081)
Change in # of Adults	0.206	0.231	0.253
	(0.140)	(0.140)	(0.144)
Change in # of Children	0.047	0.064	0.059
	(0.071)	(0.072)	(0.073)
log (median rent t) - log (median rent (t-1))	--	0.287	0.286
	--	(0.163)	(0.171)
Number of Observations	140	140	140
Year Fixed Effects	no	no	yes
R-square	9.50%	11.54%	12.87%

notes: Robust standard errors are presented below parameter estimates in parenthesis.

Table 5

The impact of excluding observable income from the main analysis

	(1) No controls	(2) Only Income	(3) All Observables
Intercept	1.877	-1.757	-1.621
	(0.735)	(0.724)	(0.697)
Median Rent (t)	0.462	0.478	0.494
	(0.098)	(0.088)	(0.087)
Median Rent (t-1)	0.221	0.206	0.203
	(0.092)	(0.081)	(0.079)
Income	--	0.348	0.284
	--	(0.027)	(0.029)
Child	--	--	0.045
	--	--	(0.017)
Adult	--	--	0.146
	--	--	(0.044)
Age	--	--	0.004
	--	--	(0.007)
Age squared (*100)	--	--	-0.002
	--	--	(0.007)
College	--	--	0.132
	--	--	(0.036)
Female	--	--	0.021
	--	--	(0.047)
Number of observations	646	646	646

Notes:

Robust standard errors below parameter estimates

Column 3 of table 6 is the same regression as Column 2 in Table 4

1.2 Other markets

- Marketing: sales, advertising

- Compensation:
  - Across jobs: Executives ($150 senator, $10m CEO)
  - Homogeneity within area, differences across areas if local comparisons

- Under perfect competition:
  - prices driven to marginal cost
  - coherent arbitrariness afffects quantities purchased

2 Framing: General

2.1 Ingredients of a model

1. Flaky preferences:
    - "Arbitrariness" in coherent arbitrariness
    - Slope of indifference curves varies within a range
    - Slope is affected by context, menu, behavior of others
    - WTP-type questions (good vs. money): hard
    - Choices across different goods (house vs. dinners, work vs. family, sport card A vs. sport card B, mug vs. chocolate): also hard
    - Choice within good (more or less money): easy

2. Narrow frame:

    - Experiments: set by experimenter (gain/losses, whose welfare is relevant)

    - Field: determined by memory constraints and by attention (stocks vs. other risk, housing vs. other goods)

    - We rarely challenge the frame set for us (obedience, simplify problem, memory)

3. Within frame, drive for consistency / good decisions:

    - "Coherence" in coherent arbitrariness

    - Rational side of brain wants 'rational' choices (no Dutch books)

    - Various preference features: limited self-control, altruism, (loss aversion)

2.2 Implications

1. When does 'coherent arbitrariness' occurs?

    - 'Arbitrariness':
        - Flakyness of preferences
        - Products not so easy to evaluate (true for most!)

    - 'Coherence': Within-subject manipulation:
        - comparability
        - purchases temporally close to each other
        - salience (memory)

2. Psychological components:

   - People evalutate changes from context or recent past.

   - Inability to give precise evaluation of utility level (hard-wired?)

   - Context matters (framing), comparison to other alternative, to market price

   - (Trick here: find instrument for context)

   - Subjects need to think that anchor can be the answer

   - Not enough to write down SS number

   - Need to ask: "Is you WTP higher than SS no.?"

3. Debiasing:

   - In experiment no alternative use of money
   - Value of $1?

   - Variant of experiment:
     - ask people to write down uses of $1
     - best alternative activity
     - Prediction: get less effect of anchor
     - Hard to know value of Lagrangean multiplyer

3 Framing: Decisions under Risk

Justin!

4 Framing: Examples

4.1 Environmental Valuations

- Kahneman, Ritov, Schkade.

- Series of facts:

- *insensitivity to levels* (between-subjects)
  - WTP for saving 2,000 (20,000 or 200,000) migrating birds?
  - $80 ($78, $88)
  - WTP to protect 57 wilderness areas vs. one area
  - 28% more

- Reflects flakiness of preferences

- Completely different if run within-subject

- *context effects* (within subjects)
  - Rate importance of problem and satisfaction from contributing to solve:
    * Coral reef problems
    * Multiple myeloma among elderly

	Import.		Moral sat.	
	CR first	M First	CR first	M First
CR	3.54	3.24	3.78	3.62
M	4.18	2.84	4.26	3.24

	WTP	
	CR first	M First
CR	$45	$69
M	$109	$59

- First evaluation reflects best guess given flaky preferences

- Second evaluation reflects rationalization given first evaluation

- *preference reversal* between vs. within
  - Kahneman, Schkade and Sunstein (1998)
  - 114 subjects decide on punitive damages
  - Background:
    * Child hurt beacause of flaw ($500,000 personal injury)
    * Business fraud ($10,000,000 personal injury)

	Punitive damage award	
	Between treatment	Within treatment
Child	$2,000,000	$2,500,000
Business	$5,000,000	$500,000

- Between: anchoring on personal injury amounts

- Within: Rational part of bran shouts: "Human life first!"

- *anchoring effects* (between-subjects)
  - As in coherent arbitrariness paper effect of SSN on answer to questions

- Flaky preferences: use anchor

- Issues:
  - Where is the budget set? Quite hard to make this realistic
  - Emotional reaction in immediate response
- Implications:
  - elicitation of environmental preferences?
  - scope for lobbies and politicians to manipulate preferences

- Example of field data decision on value of human life
- Ashenfelter and Greenstone (2004)
- Politicians can increase speed limit in 1987 in rural interstate streets
- Benefits: faster travel time
- Costs: more deaths
- Budget constraint: here reelection probability

Table 1: Sample Statistics for States that were Eligible to Raise the Speed Limit on Rural Interstates in 1987

	States Included in the Analysis		Excluded States
	Adopted 65 Mph	Retained 55 Mph	Adopted 65 Mph
	(1)	(2)	(3)
Number of States	21	7	19
Entire Period (1982-93)			
Rural Interstates			
Fatalities	57.3	24.3	55.6
Fatality Rate	1.390	0.839	1.529
Speed (Mph)	62.4	60.4	Unavailable
Urban Interstates			
Fatalities	41.0	53.5	41.9
Fatality Rate	0.748	0.747	0.992
Speed (Mph)	57.5	58.8	58.3
Rural Arterials			
Fatalities	228.5	168.9	215.8
Fatality Rate	3.357	2.844	3.411
Speed (Mph)	56.5	54.4	55.8
Statewide Totals			
Fatalities	988.5	948.8	838.9
Fatality Rate	2.289	1.922	2.331
Pre-Period (1982-1986)			
1986 Hourly Wage (1997$)	$12.33	$13.97	$12.33
1986 Rural Int. Traffic Density	0.0604	0.0929	0.0597
Rural Int. Fatality Rate	1.423	0.957	1.592
Rural Int. Speed (Mph)	59.5	59.3	60.2

Notes: The Fatality Rate is calculated as the number of fatalities per 100 million vehicle-miles of travel. Both the Fatality Rate and Speed entries are calculated as the weighted mean within each of the three categories of states, where the weight is the vehicle miles of travel on the relevant road(s). Traffic Density is vehicle miles of travel per miles of paved road lanes. The mean hourly wage in 1986 is calculated from the 1986 *Current Population Survey Outgoing Rotation Group*. It is calculated from all workers that report an hourly wage greater than $2.50. The survey top-codes the hourly wages of workers that are paid on an hourly basis at $99.99. We constructed an hourly wage for workers that are not paid hourly and also top-coded it at $99.99. The Fatalities, Hourly Wage and Traffic Density entries are the mean across states within each category. See the text and Figure 2 for the identity of the states in each category.

Table 2B: Difference in Differences Estimates of 65 Mph Speed Limit on Fatality Rates and Speeds

	DD of Levels Normalized by Pre-Period Level in Adopting States (1)	DD of Natural Logarithms (2)
Rural Interstates (Affected Roadtype)		
Fatality Rate	13.0%	0.311
Speed	4.7%	0.045
Urban Interstates (Unaffected Roadtype)		
Fatality Rate	-5.9%	-0.063
Speed	-0.9%	-0.009
Rural Arterials (Unaffected Roadtype)		
Fatality Rate	-3.2%	0.005
Speed	0.9%	0.008

See Notes to Tables 1 and 2A. The entries in this table represent two different difference in differences estimates of the effects of the 65 mph speed limit on fatality rates and speeds. The column (1) entries are the raw DD estimates from Table 2A, normalized by the pre-period level in adopting states. The column (2) entries are calculated with the mean of ln (fatality rate) and ln (speed) for adopters and non-adopters in the pre and post periods. The entries are equal to the post - pre difference of weighted means among adopters minus the post - pre difference of weighted means among non-adopters, where the weight is vehicle miles of travel.

Table 6A: Estimates of the Monetary Value of the Time Saved per Marginal Fatality

Sample	(1)	(2)	(3)
Functional Form I: Ln Transformation			
Rural Interstates	---------	-0.113**	---------
Only		(.037)	
		[$1.64 million]	
Rural Interstates &	-0.095*	-0.076*	-0.076**
Urban Interstates	(.040)	(.034)	(.031)
	[$1.38 million]	[$1.11 million]	[$1.11 million]
Rural Interstates &	-0.166**	-0.146*	-0.122*
Rural Arterials	(.057)	(.066)	(.051)
	[$2.42 million]	[$2.12 million]	[$1.78 million]
All Three	-0.128**	-0.103**	-0.099**
	(.042)	(.041)	(.034)
	[$1.86 million]	[$1.50 million]	[$1.44 million]
Year Indicators	Yes	No	No
Year-Roadtype Indicators	No	Yes	Yes
State-Roadtype Indicators	Yes	Yes	Yes
State-Year Indicators	No	No	No

Notes: See Notes to Table 5. The entries report the results from regressions of ln (Hours of Travel) on ln (Fatalities), where an indicator for whether the 65 mph speed limit was in force is an instrumental variable for ln (Fatalities). Ln (vmt) is a control and its effect is allowed to vary by roadtype. The entries are the parameter estimates and heteroskedastic consistent standard errors (in parentheses) on ln (Fatalities) and the implied monetary value of the time saved per marginal fatality, V, [in square brackets]. * indicates significance at 5% level; ** indicates significance at 1% level.

4.2 Menu effects

- Choice between A, B, C, and D

- Availability of C and D affects references between A and B

- Three effects:

  1. Emphasis of trade-off

  2. Dominated option increases attractiveness

  3. Preference for middle ground

- *Emphasis of trade-off.* (Simonson and Tversky, 1992)

- Table 29.1 and Figure 29.2 in CVF

- Conjecture: All of this depends on rational size of brain trying to find 'best' choice
  - Uncertainty about tradeoff
  - Use background trade-off to infer indifference curves
  - (could be rational information story)

- *Dominated option.* (Simonson and Tversky, 1992)

	$6 cash	Nice Cross pen	So so pen
Group A (N=106)	64%	36%	
Group B (N=115)	52%	46%	2%

- Preference for dominance

- Rational part of brain finds easier to prefer pen

- *Preference for middle ground.*

	Minolta $170	Min.+ $240	Min.++ $470
A:N=106	50%	50%	
B:N=115	22%	57%	21%

- Absence of dominance

- Brain looks for cues, such as middle ground

- Field avenues:

- Clear implictions for marketing

- Field experiments:
  - charities
  - car washing
  - health insurances
  - credit card contracts

- Consumer welfare?

- Important application. Why Psychology and Economics is best field:-)
  - more interesting than economics
  - way more serious than pyshology
  - nice middle ground
  - P&E dominates both disciplines!