

## Coherent arbitrariness

Stable preferences in an unstable world

## Pricing?

- How do we decide if we should buy a cup of coffee (for \$3)?
- Ideally an internal representation of coffee will be compared to price.
  - If value > price → buy
  - If value < price → don't buy

## How about new products?

- How much is this sound worth?
- How come the the sound is so different from coffee?
  - Sound should be simpler...

## Some intuitions

- Can one map the pleasure of a chocolate-bar to money?
- Is this mapping immediate & direct?
- How about chocolate vs. ice-cream?

## The questions

- How do people decide about the pricing-values of goods?
  - Novel hedonic stimuli
- Do people learn over time?
  - & What

## Fundamental Values

- Economic theories assume underlying “fundamental” values.
- Rarely, however, is it possible to measure fundamental values.
  - Virtually all tests of economic predictions examine the effect of changes in circumstances on valuation.
- Such results are necessary but not sufficient condition for fundamental valuation.

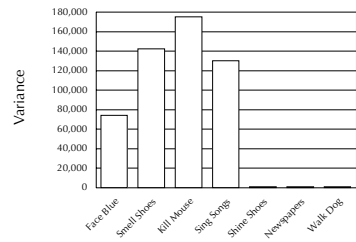
## A psychological perspective

- Sensitivity to anchors
  - Kahneman & Tversky, 1974
- Context effects
  - Simonson & Tversky, 1992
- → People often have an imperfect understanding of their own values

## How do people “create” value?

- Based on internal evaluations?
- Based on external cues?
  - If both when...
- If people don't have fundamental values, how is it that observed behavior is so consistent.

## A toy example



## Experiment 1 Procedure

- Do people have fundamental values?
- 2 (Anchor) by 2 (order) by 3 (duration) by 3 (replications)

## Experiment 1 Procedure

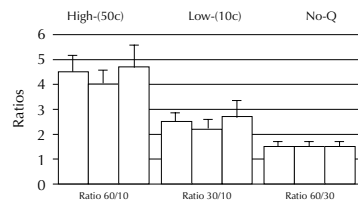
Introduction  
 Subjects listen to sound

Hypothetical question  
 No anchor  
 10€  
 50€  
 ..

Bidding for real X 9  
 Getting real payoffs

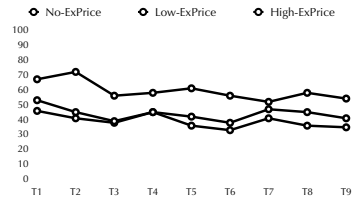
Increasing 10 sec, 30 sec, 60 sec  
 Decreasing 60 sec, 30 sec, 10 sec

## Experiment 1 Results I



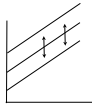
## Experiment 1 Results II

WTH over time



## Experiment 1 Conclusions

- Subjects do not have internal value for novel hedonic stimuli
- Once a response is made, other responses follow
- Coherent arbitrariness



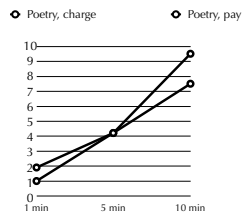
## Real products

	Mean value	Low ss#	High ss#	Increase
Trackball	16.25	10.38	21.52	107%
Keyboard	32.47	21.81	42.03	93%
\$9 wine	15.80	11.62	19.55	68%
\$82 wine	22.89	17.42	27.76	59%
Design book	18.81	14.15	23.00	62%
Belgian Chocolates	13.31	10.04	16.24	62%

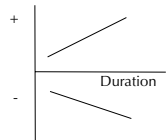
- High dependency between the prices of the 2 wines and 2 computer accessories

## Tom Sawyer

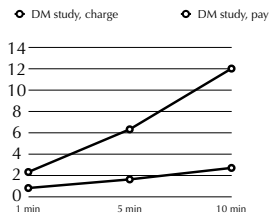
## Poetry I



## Poetry II



## Decision making exp



## "The model"

- Self herding
- Evaluating self preferences is hard
- Behavior is a signal for preferences
- Frequent behavior is taken as a strong signal

## Experiment 2 Procedure

- Will the forces of the market correct arbitrariness?
- 2 (Anchor) by 2 (order) by 3 (duration) by 3 (replications)
- Anchors were 10€ and 100€
- Groups (Markets), not individuals

## Experiment 2 Procedure

Introduction  
Subjects listen to sound

Hypothetical question  
No anchor  
10€  
100€  
...

Bidding for real X 9

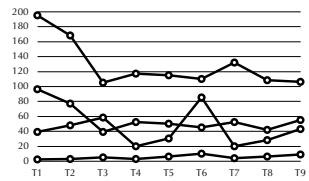
Getting real payoffs

Increasing 10 sec, 30 sec, 60 sec  
Decreasing 60 sec, 30 sec, 10 sec

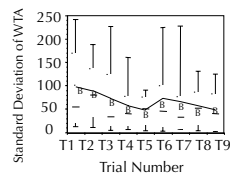
## Experiment 2 Results I

Bids and wins over time

● Bid Low-ExPrice ● Bid High-ExPrice ● Win Low-ExPrice ● Win High-ExPrice



## Experiment 2 Results II



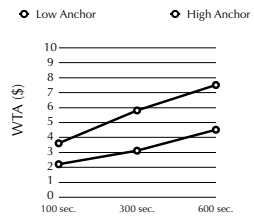
## Experiment 2 Conclusions

- Arbitrary values are not “corrected” over time
- Arbitrary values are not “corrected” in marketplaces
- Learning to arbitrary values?

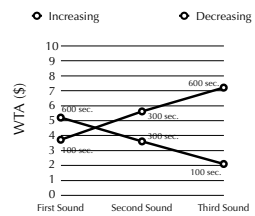
## Experiment 3

- Known random anchors
- Use subjects' own SS#
- Larger magnitude
  - 100 sec, 300 sec, 600 sec
- Same basic procedure as in Exp 1
  - Plus ranking of small annoying tasks

### Experiment 3 results I



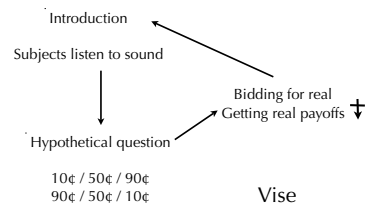
### Experiment 3 results II



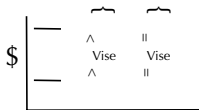
## Experiment 4

- What is the role of the first anchor?
  - Information?
  - Changes utility or mapping?
- 3 (sounds) by 2 (order) by 3 (Anchor)
  - Anchors were 10€, 50€ and 90€
  - Duration was constant at 30 sec.
  - Type of sound changed
  - Fourth trial was the same as trial#1 + vise

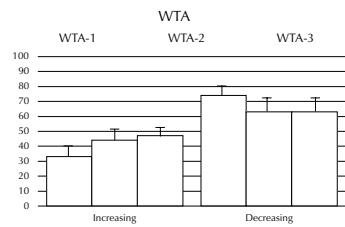
## Experiment 4 Procedure I



## Why the vise?



## Experiment 4 Results WTA





## Experiment 4 Results II

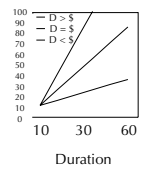
- Significant effect of order
- No effect for anchors
  
- No effect for Vise/Sound choice

## Experiment 4 Conclusions

- The first trial had a large role
- The first response determines future responses
  
- Not an inference process
  - Using the anchor as information

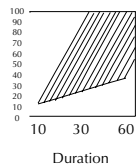
## Utility theory interpretation

- Traditional view on tradeoffs



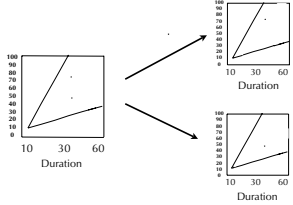
## Utility theory interpretation

- "Incomplete preference" view on tradeoffs



## Utility theory interpretation

- Initial response and its consequences



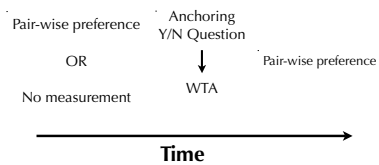
## Utilities or mapping?

- Leftovers
  - Experiment 3 (large payoffs & Random anchor)
    - Rank order of small annoying tasks
      - Blood test, missing a bus, dropping your ice-cream etc.
  - Experiment 4 (3 different anchors)
    - Choice of sound vs vise
- No effect for anchoring!

## Utilities vs. mapping experiment

- Anchoring 4 stimuli
  - A 1 sec shock from a 9V battery
  - A bad drink (OJ & vinegar)
  - Drinking from a new bedpan
  - Eating a spoon of butter
- 4 Values (\$0.5, \$1, \$2, \$4)

## The procedure



## Results Anchoring

- Bedpan: [ $R^2 = 0.46$ ,  $F = 17.96$ ,  $p < 0.01$ ]
- Butter: [ $R^2 = 0.28$ ,  $F = 5.8$ ,  $p < 0.02$ ]
- Shock: [ $R^2 = 0.34$ ,  $F = 8.8$ ,  $p < 0.01$ ]
- Drink: [ $R^2 = 0.29$ ,  $F = 6.23$ ,  $p < 0.02$ ]

## Results effects on pair-wise

- Are the pair-wise preferences influenced by the ratios of the pair-wise anchors?
  - Shock/bedpan ( $R^2 = 0.046$ )
  - Bedpan/butter ( $R^2 = 0.023$ )
  - Bedpan/drink ( $R^2 = 0.002$ )
  - Butter/shock ( $R^2 = 0.002$ )
  - Drink/Shock ( $R^2 = 0.011$ )

## Mapping or utilities -- summary

- So far evidence for mapping
- Questions
  - What makes mapping difficult?
  - Money? (sound vs. drink → no)
  - Abstract attributes?
  - Distance?

## Conclusions

- The coherence of the market seem to reflect the psychology of relative valuations
- People do not seem to have fundamental values even for simple experiences
- Is money a bad idea?

## Possible Applications / economics I

- 1 Financial markets (Shiller, 1987)
  - 1 "Who would know what the value of the Dow Jones Industrial Average should be? Is it really "worth" 6,000 today? Or 5,000 or 7,000? or 2,000 or 10,000? There is no agreed-upon economic theory that would answer these questions. In the absence of any better information, past prices (or asking prices or prices of similar objects or other simple comparisons) are likely to be important determinants of prices today."  
- From: Shiller, Robert J. "Investor Behavior in the October 1987 Stock Market Crash: Survey Evidence." Cambridge, MA: National Bureau of Economic Research, 1987.
  - 1 Market reactions are sensitive to performance relative to expectations (IBM is doing X better than expected) and to other relative changes (IBM is buying back X stocks)

## Possible Applications / economics II

- 1 Labor markets Bewley (1998).
  - 1 "Non-union companies seemed to be isolated islands, with most workers having little systematic knowledge of pay rates at other firms. Pay rates in different non-union companies were loosely linked by the forces of supply and demand, but these allowed a good deal of latitude in setting pay"  
- From: Bewley, Truman. "Why Not Cut Pay?" *European Economic Review* 42, 1998, pp. 459-490.
  - 1 Well being within a company is related to relative pay to others and to former levels

## Possible Applications / economics III

- 1 contingent valuation
  - 1 "valuations of any particular quantity [of a good] would be sensitive to its relative position within the range selected for valuation, but insensitive to which range is chosen, resulting in insensitive (or incoherent) values across studies using different quantity ranges" Frederick and Fischhoff (1998, p. 116)  
- From: Frederick, S., and B. Fischhoff. "Scope Insensitivity in Elicited Values." *Risk Decision and Policy* 3, 1998, pp. 109-124.
  - 1 BUT, within subjects evaluations are coherent

## Possible Applications / economics IV

- 1 Criminal deterrence (Ross, 1973)
  - 1 People seem sensitive to policy changes in deterrence (perhaps only short term)
  - 1 People seem insensitive to absolute levels of probability of punishment
  - 1 Reactions to crime also have a very strong cultural effects

- Based on: Ross, H. L. "Law, Science and Accidents: The British Road Safety Act of 1967." *Journal of Legal Studies* 2, 1973, pp. 1-76.

## Marketing implications

- First price has long lasting implications
- Products are comparative in nature
  - Understanding what a product will be compared to is important
- Product lines and product extensions