

# Anomalies

December 2, 2019

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- ▶ Result: 25% if lower number, 45% if higher number

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- ▶ For each product, asked if they would buy it at a price equal to the last two digits of their social security number
- ▶ Then, asked to state willingness to pay (via BDM mechanism)
  - ▶ In BDM, you report a number (WTP)
  - ▶ Random device draws a number at random
  - ▶ If WTP is above the draw, you get the item and pay an amount equal to the draw
  - ▶ If WTP is below the draw, you do not pay anything and do not get the item
- ▶ Random whether product is sold based on Yes/No or WTP

# Anchoring

Quintile of SS# distribution	Cordless trackball	Cordless keyboard	Average wine	Rare wine	Design book	Belgian chocolates
1	\$ 8.64	\$16.09	\$ 8.64	\$11.73	\$12.82	\$ 9.55
2	\$11.82	\$26.82	\$14.45	\$22.45	\$16.18	\$10.64
3	\$13.45	\$29.27	\$12.55	\$18.09	\$15.82	\$12.45
4	\$21.18	\$34.55	\$15.45	\$24.55	\$19.27	\$13.27
5	\$26.18	\$55.64	\$27.91	\$37.55	\$30.00	\$20.64
Correlations	.415	.516	0.328	.328	0.319	.419
	$p = .0015$	$p < .0001$	$p = .014$	$p = .0153$	$p = .0172$	$p = .0013$

# Anchoring

- ▶ Irrelevant (random) information has an effect on probability assessment and valuations of products
- ▶ Evidence elsewhere of effect on other types of valuations
- ▶ Interpretation: power of suggestion (Kahneman), lack of stability in preferences
- ▶ Experimenter demand effects?



Tom W. is a graduate student at the main university in your state. Please rank the following nine fields of graduate specialization in order of the likelihood that Tom W. is now a student in each of these fields. Use 1 for the most likely and 9 for the least likely:

- ▶ business administration
- ▶ computer science
- ▶ engineering
- ▶ humanities and education
- ▶ law
- ▶ library science
- ▶ medicine
- ▶ physical and life sciences
- ▶ social science and social work

The following is a personality sketch of Tom W. written during Tom's senior year in high school by a psychologist, on the basis of psychological tests of uncertain validity:

Tom W. is of high intelligence, although lacking in true creativity. He has a need for order and clarity, and for neat and tidy systems in which every detail finds its appropriate place. His writing is rather dull and mechanical, occasionally enlivened by somewhat corny puns and by flashes of imagination of the sci-fi type. He has a strong drive for competence. He seems to feel little sympathy for other people and does not enjoy interacting with others. Self-centered, he nonetheless has a deep moral sense.

Now please take a sheet of paper and rank the nine fields of specialization listed below by how similar the description of Tom W. is to the typical graduate student in each of the following fields. Use 1 for the most likely and 9 for the least likely:

- ▶ business administration
- ▶ computer science
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# Representativeness heuristic

- ▶ The typical finding is that subjects guess that Tom is most likely to be a computer scientist (high posterior probability)
- ▶ Even though computer science is a very unlikely major (low prior probability)
- ▶  $P(CS|Tom) = \frac{P(Tom|CS)P(CS)}{P(Tom)}$  and  $P(CS) \approx 3\%$
- ▶ Subjects answer the simpler question about similarity instead of the more difficult question of probability (which they should be answering)

# The Linda Problem

Linda is 31 years old, single, outspoken, and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations. Which of the two alternatives below is more probable?

- ▶ Linda is a bank teller
- ▶ Linda is a bank teller and is active in the feminist movement



## Linda results

<https://www.poll-maker.com/results2640892x901b7C57-76>

## Charness, et al. (2010)

- ▶ **Baseline:** Subjects asked the same question you were just asked on a sheet of paper (\$2 for answering)
- ▶ **Incentives:** Subjects asked the same question you were just asked on a sheet of paper (\$4 for marking correct answer)
- ▶ **Pairs, no incentives:** Same as baseline, except subjects formed pairs to discuss the answer
- ▶ **Pairs, incentives:** Same as incentives, except subjects formed pairs to discuss the answer
- ▶ **Trios, no incentives:** Same as baseline, except subjects formed groups of three to discuss the answer
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# Results

**Table 1**

Violations of the conjunction rule.

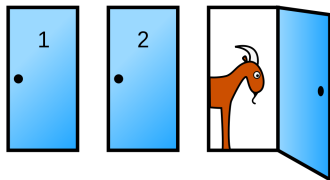
Study	Details	Incorrect answers/total sample	Error rate (percent)
<i>Individuals</i>			
T&K, 1983	UBC undergrads, no incentives	121/142	85.2
CKL, 2008	UCSB students, singles, no incentives	50/86	58.1
CKL, 2008	UCSB students, singles, incentives	31/94	33.0
CKL, 2008	UCSB students, total singles	<b>81/180</b>	<b>45.0</b>
<i>Pairs</i>			
CKL, 2008	UCSB students, in pairs, no incentives	27/56	48.2
CKL, 2008	UCSB students, in pairs, incentives	5/38	13.2
CKL, 2008	UCSB students, total in pairs	<b>32/94</b>	<b>34.0</b>
<i>Trios</i>			
CKL, 2008	UCSB students, in trios, no incentives	10/39	25.6
CKL, 2008	UCSB students, in trios, incentives	5/48	10.4
CKL, 2008	UCSB students, total in trios	<b>15/87</b>	<b>17.2</b>



# Monty Hall Problem

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Consider the problem just described to you...



- ▶ Do you switch to door 2?



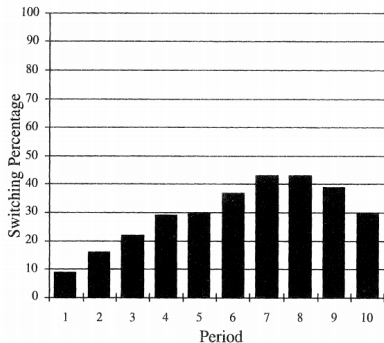
# Monty Hall results

<https://www.poll-maker.com/results2640914xae73acb7-76>

## Friedman (1998)

- ▶ In Run1, 104 subjects play a computerized version of the Monty Hall problem
- ▶ 10 rounds, play by choosing cards (one prize card, two non-prize cards)
- ▶ 40 cents for turning over prize card, 10 cents for turning over non-prize card

# Friedman (1998)



- ▶ Results:  
Overall switch rate: **28.7%**
- ▶ Possible explanations:
  - ▶ Illusion of control
  - ▶ Escalation of commitment (“no flip-flopping”)
  - ▶ Principle of insufficient reason

## Run 2

After the initial 10 rounds, each subject participates in one *or more* of four additional treatments:

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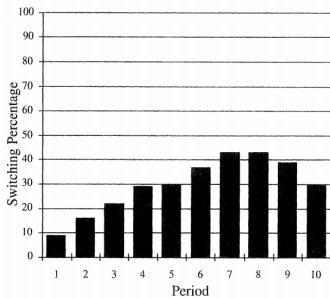
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- ▶ One subject excluded because of prior knowledge of the task

## Run 1:



28.7% switch rate

## Run 2:

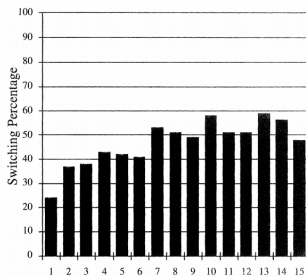


FIGURE 2. SWITCHING PERCENTAGE IN RUN2

46% switch rate

# Treatment effects

TABLE 2—SWITCH RATES BY TREATMENT

		Nobs	Percent All periods	Percent Periods 1–7	Percent Periods 8–15
0	Overall ( <i>p</i> -value)	1,407	46.0	39.8	52.6 (0.000)
1	<i>Intense</i>	791	43.9	37.9	51.3
	<i>Not Intense</i> ( <i>p</i> -value)	616	48.7 (0.968)	42.7 (0.915)	54.0 (0.782)
2	<i>Track</i>	647	48.0	41.9	54.8
	<i>No Track</i> ( <i>p</i> -value)	760	43.4 (0.048)	36.9 (0.101)	49.8 (0.113)
3	<i>Advice</i>	804	47.4	40.6	55.0
	<i>No Advice</i> ( <i>p</i> -value)	603	44.1 (0.122)	38.7 (0.327)	49.5 (0.087)
4	<i>Compare</i>	647	50.3	40.2	59.4
	<i>No Compare</i> ( <i>p</i> -value)	760	42.4 (0.001)	39.5 (0.458)	46.0 (0.000)

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## *Ingredients*

1. A common and useful rule of thumb, e.g. no flip-flopping or principle of insufficient reason
2. A laboratory environment that invokes the rule of thumb when it is inappropriate, e.g. where flip-flopping is optimal
3. Subjects inexperienced in the laboratory environment
4. Standard laboratory procedures
5. Standard statistical techniques and standard rhetoric

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  3. Subjects inexperienced in the laboratory environment
  4. Standard laboratory procedures
  5. Standard statistical techniques and standard rhetoric
- ▶ “Optical illusions arising from misleading visual cues are interesting but do not imply the need to modify the theory of optics. Likewise, irrational choices arising from incomplete information do not imply the need to modify standard choice theory.”