Cognition

PSYC 2040

L11: Judgment and Decision-Making

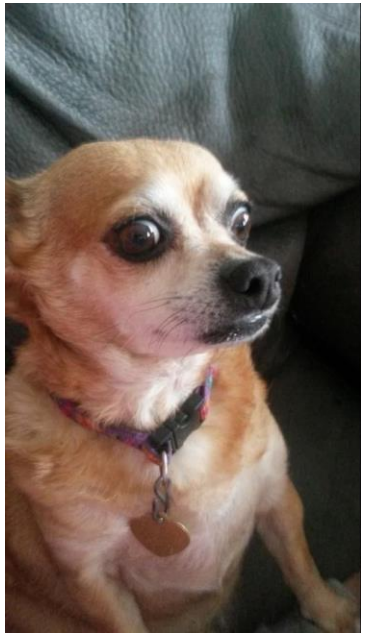
Part 2

logistics

11	T: April 1, 2025	W11: Decision making
11	Th: April 3, 2025	W11 continued…
11	Su: April 6, 2025	**Week 11 Quiz due**
11	Su: April 6, 2025	**Jennifer's Office Hours (7-9 pm, Kanbar 200)**
12	M: April 7, 2025	**Project: Argument due**
12	T: April 8, 2025	W12: Social cognition
12	Th: April 10, 2025	W12 continued…
12	Su: April 13, 2025	**Week 12 Quiz due**

how do we make choices?

- *not* using stable and transitive preferences
- *not* by maximizing expected value
- *not* by maximizing expected utility



activity: scenario 1

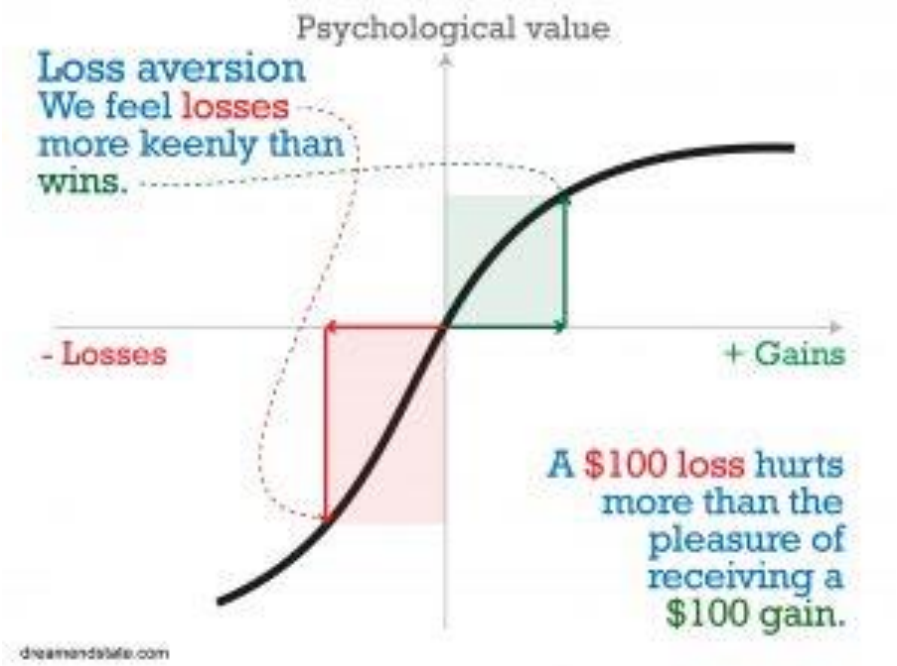
- Option A: offers a guaranteed return of $1000.
- Option B: a gamble with a 50% chance of winning $2000 and a 50% chance of winning nothing.

activity: scenario 2

- Option A: offers a guaranteed loss of $1000.
- Option B: a gamble with a 50% chance of losing $2000 and a 50% chance of losing nothing.

prospect theory

- people prefer more certain gains rather than the prospect of larger gains with more risk



https://www.dreamendstate.com/2021/02/15/prospect-theory-why-we-feel-losses-more-intensely-than-gains/

prospect theory: phases

editing phase

- your initial response, likely using heuristics and prone to biases

evaluation phase

- compute utility and proceed accordingly

algorithms vs. heuristics vs. biases

- algorithms: a precise set of rules/processes guaranteed to produce the correct answer to a problem (EVT/EUT)
- heuristics: “rules of thumb” / mental shortcuts due to the limits of information processing
- biases: systematic errors of judgment (driven by heuristics)
- three key heuristics that lead to a range of biases:
  - representativeness
  - availability
  - adjustment and anchoring

activity debrief: group 1

- Consider all first-year graduate (masters/Ph.D.) students in the U. S. today.
- select the specialization that you think has the highest percentage of enrolled graduate students

specialization
business administration
computer science
engineering
humanities
education
medicine
life sciences
social sciences

activity debrief: group 2

- Tom V. 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 gashes of imagination of the sci-fi type. He has a strong drive for competence. He seems to have little feel and little sympathy for other people and does not enjoy interacting with others. Self centered, he nonetheless has a deep moral sense.

activity debrief: group 2

- Think about the typical graduate student in each of these specializations
- For which specialization is Tom most similar to the typical graduate student?

specialization
business administration
computer science
engineering
humanities
education
medicine
life sciences
social sciences

activity debrief: group 3

- Tom V. 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 Hashes of imagination of the sci-fi type. He has a strong drive for competence. He seems to have little feel and little sympathy for other people and does not enjoy interacting with others. Self centered, he nonetheless has a deep moral sense.

activity debrief: group 3

- The preceding personality sketch of Tom V. was written during Tom's senior year in high school by a psychologist, on the basis of projective tests. Tom V. is currently a graduate student.
- Which specialization is Tom most likely to be pursuing in graduate school?

specialization
business administration
computer science
engineering
humanities
education
medicine
life sciences
social sciences

activity debrief

- group 1 was asked about general rates of specialization (base rate)
- group 2 was given a sketch and asked to pick the specialization Tom would be most similar to (representativeness)
- group 3 was given a sketch and asked which specialization Tom would most likely pursue (likelihood)
- ideally, group 3 should be using base rates
- but, in practice, people use representativeness

representativeness heuristic

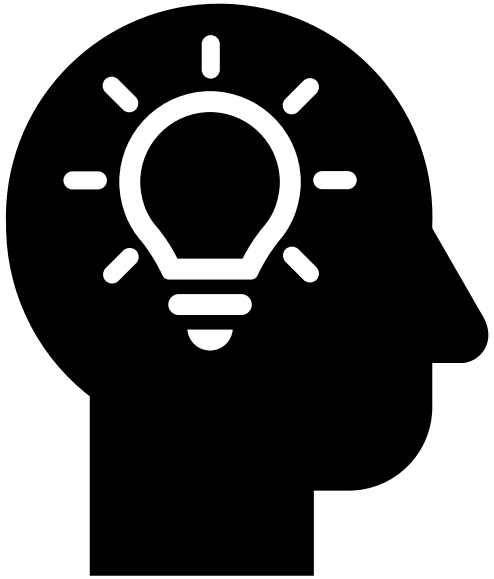
- people use the similarity of an event/example to the parent population to judge likelihoods
- “what is the probability that A belongs to B” (group 3) becomes “to what degree is A representative of B?” (group 2), ignoring the base rates (group 1)

ESTIMATED BASE RATES OF THE NINE AREAS OF GRADUATE SPECIALIZATION AND SUMMARY OF SIMILARITY AND PREDICTION DATA FOR TOM W.

Graduate specialization area	Mean judged base rate (in %)	Mean similarity rank	Mean likelihood rank
Business Administration	15	3.9	4.3
Computer Science	7	2.1	2.5
Engineering	9	2.9	2.6
Humanities and Education	20	7.2	7.6
Law	9	5.9	5.2
Library Science	3	4.2	4.7
Medicine	8	5.9	5.8
Physical and Life Sciences	12	4.5	4.3
Social Science and Social Work	17	8.2	8.0

availability heuristic

- people use the ease with which relevant instances come to mind to judge an event's frequency and probability



availability heuristic

- people use the ease with which relevant instances come to mind to judge an event's frequency and probability
- people were more likely to judge that R appears more in the first position than third position, even though the opposite was true

A typical problem read as follows:

"Consider the letter *R*.

Is R more likely to appear in ___ the first position?
___ the third position?
(check one)

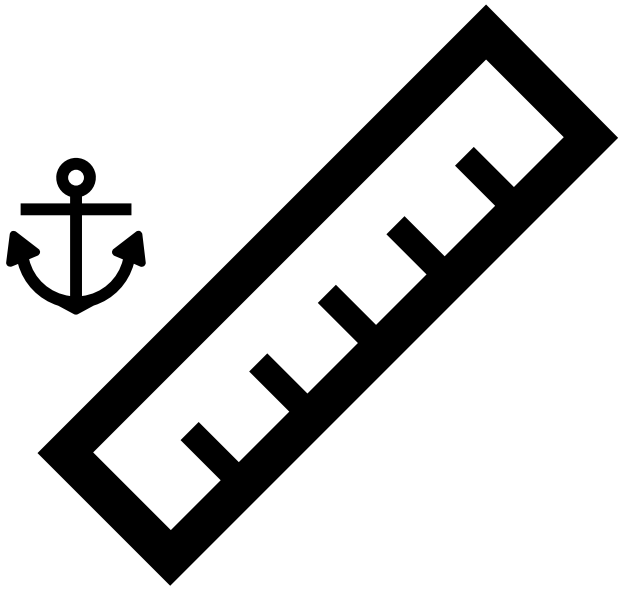
My estimate for the ratio of these two values is _____: 1."

Subjects were instructed to estimate the ratio of the larger to the smaller class. For half the subjects, the ordering of the two positions in the question was reversed. In addition, three different orderings of the five letters were employed.

Results. Among the 152 subjects, 105 judged the first position to be more likely for a majority of the letters, and 47 judged the third position to be more likely for a majority of the letters. The bias favoring the first position is highly significant ($p < .001$, by sign test). Moreover, each of the five letters was judged by a majority of subjects to be more frequent in the first than in the third position. The median estimated ratio was 2:1 for each of the five letters. These results were obtained despite the fact that all letters were more frequent in the third position.

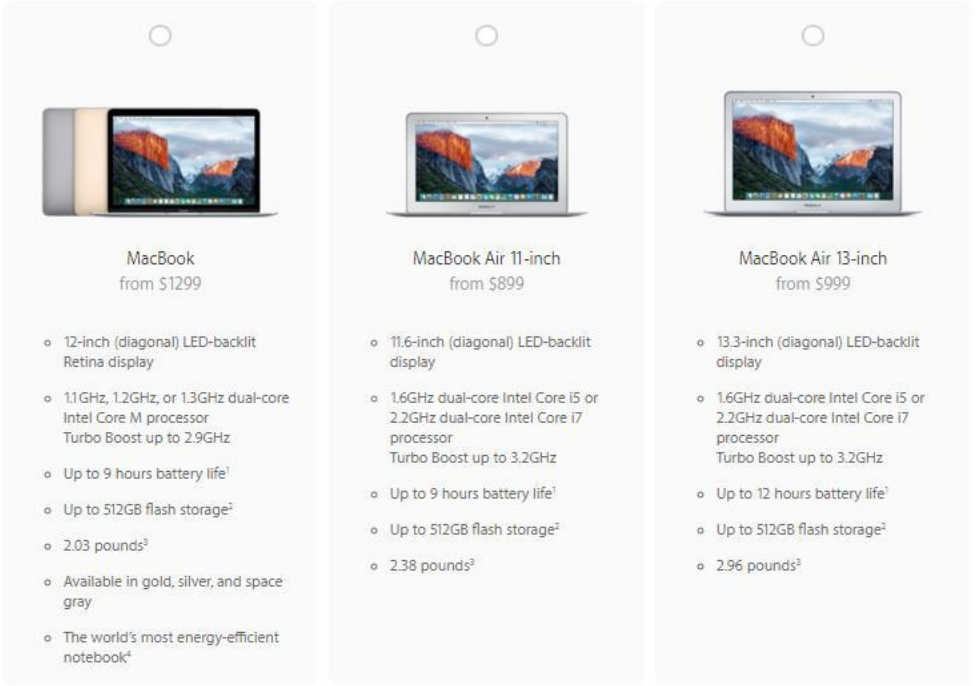
adjustment and anchoring

- people make estimates by starting with an initial value and adjusting it to yield a final decision



choice and heuristics

- lexicographic heuristic
  - focus on one attribute
- elimination
  - focus on a threshold & eliminate
- satisficing
  - focus on a threshold & select first one



MacBook
from $1299

- 12-inch (diagonal) LED-backlit Retina display
- 1.1 GHz, 1.2GHz, or 1.3GHz dual-core Intel Core M processor Turbo Boost up to 2.9GHz
- Up to 9 hours battery life[1]
- Up to 512GB flash storage[2]
- 2.03 pounds[3]
- Available in gold, silver, and space gray
- The world's most energy-efficient notebook[4]

MacBook Air 11-inch
from $899

- 11.6-inch (diagonal) LED-backlit display
- 1.6GHz dual-core Intel Core i5 or 2.2GHz dual-core Intel Core i7 processor Turbo Boost up to 3.2GHz
- Up to 9 hours battery life[1]
- Up to 512GB flash storage[2]
- 2.38 pounds[3]

MacBook Air 13-inch
from $999

- 13.3-inch (diagonal) LED-backlit display
- 1.6GHz dual-core Intel Core i5 or 2.2GHz dual-core Intel Core i7 processor Turbo Boost up to 3.2GHz
- Up to 12 hours battery life[1]
- Up to 512GB flash storage[2]
- 2.96 pounds[3]

apartment choices

- are Jose's preferences transitive?
- can heuristics explain this?

Jose is looking for a new apartment and uses the following decision rule when choosing between pairs of rental apartments: First he looks at the apartment's distance to his school, and if the distance of the candidates differs by more than 0.25 miles, he chooses the candidate with the shorter distance. If the candidates have distances to school that differ by less than 0.25 miles, he looks at how many of his friends already live there (i.e., the number of friends). If the number of friends, between the two apartments, differ by more than 2 people, he takes the option with more of his friends already living there. If the number of friends differs by 2 or less than 2 people, he looks at how affordable the apartment is (i.e., Affordability, where 0 means extremely unaffordable, and 10 means extremely affordable). If the affordability differs by more than 2, he takes the option that is more affordable.

Here are three apartment options:

	Distance to School	Number of Friends	Affordability
Somerset Place	.6 miles	6 friends	1
Kempton Building	.3 miles	0 friend	4
Locust Buildings	.4 miles	3 friends	0

factors that influence choice

- utilities (expected/literal or psychological)
- heuristics/biases
- emotion and affective states
- social context

affect

- a “feeling state”
- expected affect
- incidental affect

gamble example

You have been given a gamble offering you $20 with a 94% chance, and $0 otherwise

We will now play out the gamble

You win $20

Rate how you feel on a scale of -50 to +50

gamble example

You have been given a gamble offering you -$40 with a 17% chance, and $0 otherwise

We will now play out the gamble

You lose $40

Rate how you feel on a scale of -50 to +50

affect affecting decisions

- Mellers et al. 1997 examined affective responses for gamble outcomes
- participants were given individual gambles offering an outcome of y with probability p, and 0 with probability 1-p (note that y could also be negative)
- the gambles were then played out for the participants
- participants were asked to rate their emotional responses

affect during decision-making

- higher emotional responses for higher outcomes
- diminishing sensitivity for positive outcomes and increasing sensitivity for negative outcomes

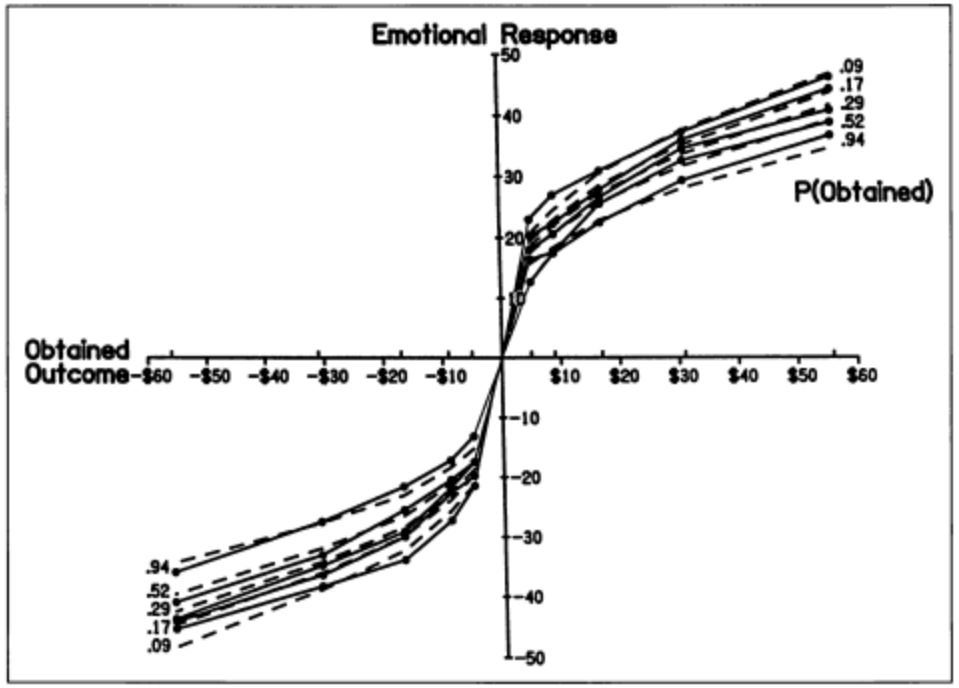
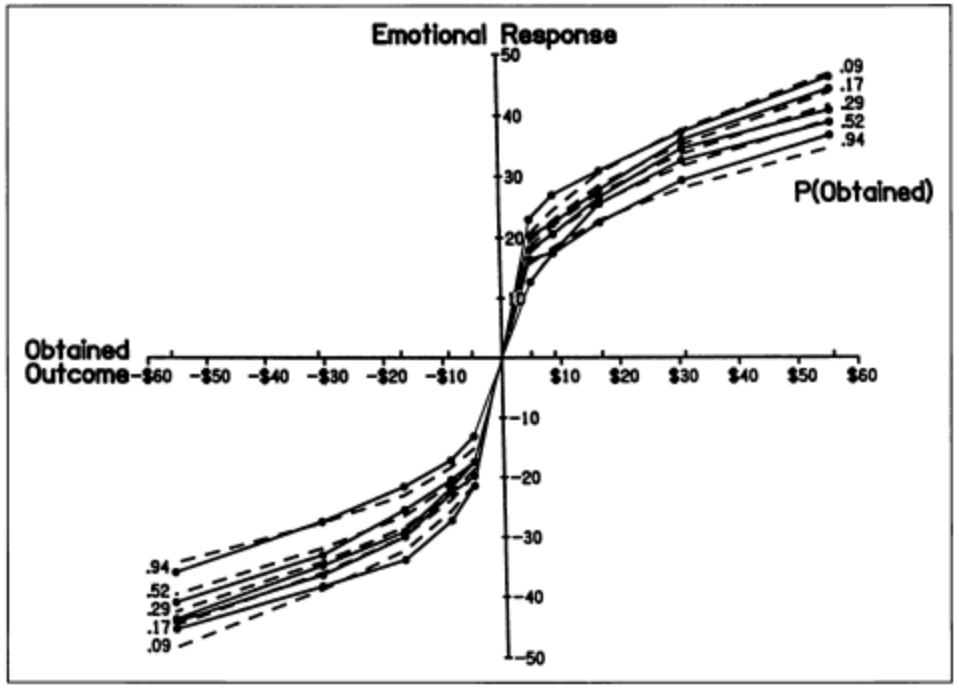


Fig. 2. Emotional responses to gains and losses from Experiment 1 plotted against obtained outcomes with a separate curve for each probability of the obtained outcome. Unobtained outcomes were always zero. The spacing between the curves shows the effect of surprise. Dashed lines are predictions of decision affect theory.

affect during decision-making

- affective responses to gamble outcomes mimic the utilities that people place on the outcomes (according to prospect theory)



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incidental hunger

- Read and Van Leeweven (1998) tested for the effect incidental hunger on immediate and future food choic
- two sessions (separated by one week)
- participants were either hungry (H) or satiated (S)
- session 1: participants choose a snack for consumpti during the second session. While making this choice, knew whether or not they would be hungry or satiate the second session.
- session 2: participants were allowed to change their choice (and consume either the healthy or unhealthy snack)
    - HH: Hungry in first session, hungry in second session
    - HS: Hungry in first session, satiated in second session
    - SH: Satiated in first session, hungry in second session
    - SS: Satiated in first session, satiated in second

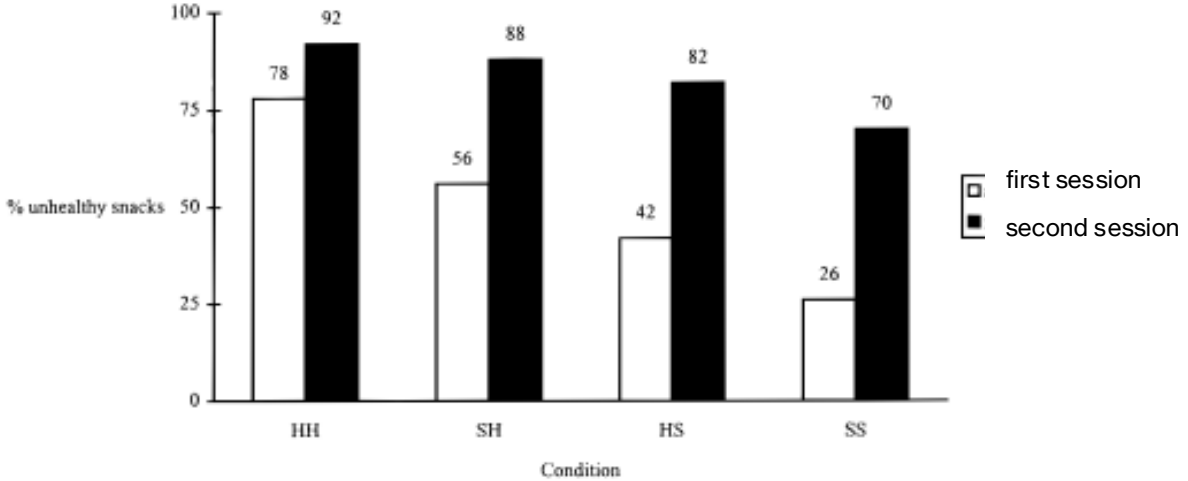

FIG. 1. Percentage of unhealthy snacks chosen in all conditions

incidental hunger

- incidental hunger makes people more likely to choose unhealthy snacks for the future (even if they won't be feeling hungry at the future time of consumption)

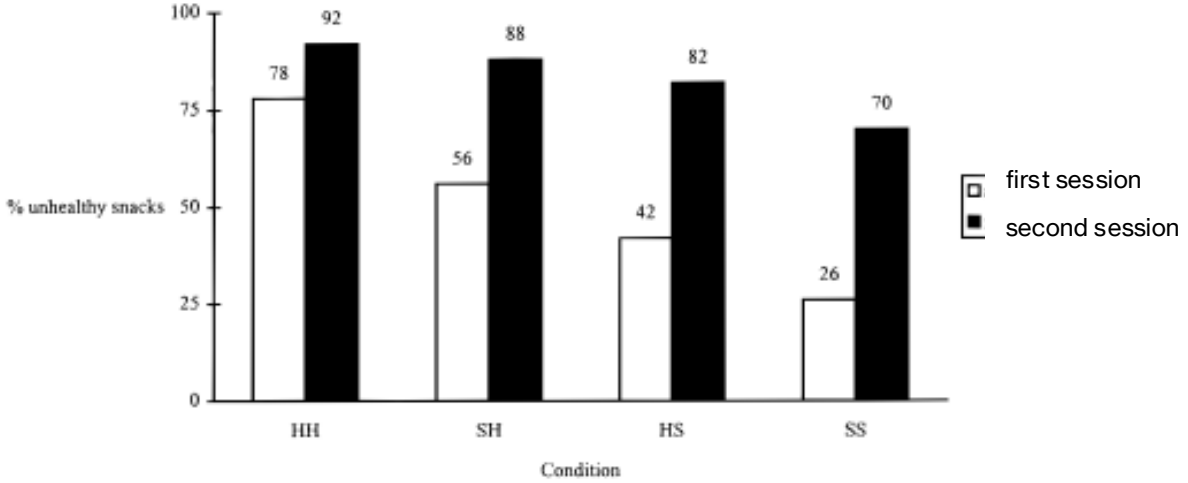

FIG. 1. Percentage of unhealthy snacks chosen in all conditions

incidental mood

- Johnson and Tversky (1983) asked participants to rate the probabilities of various negative events.
- affect was experimentally manipulated:
  - negative mood: sad stories before task
  - positive mood: happy stories before task
  - control: neutral stories before task

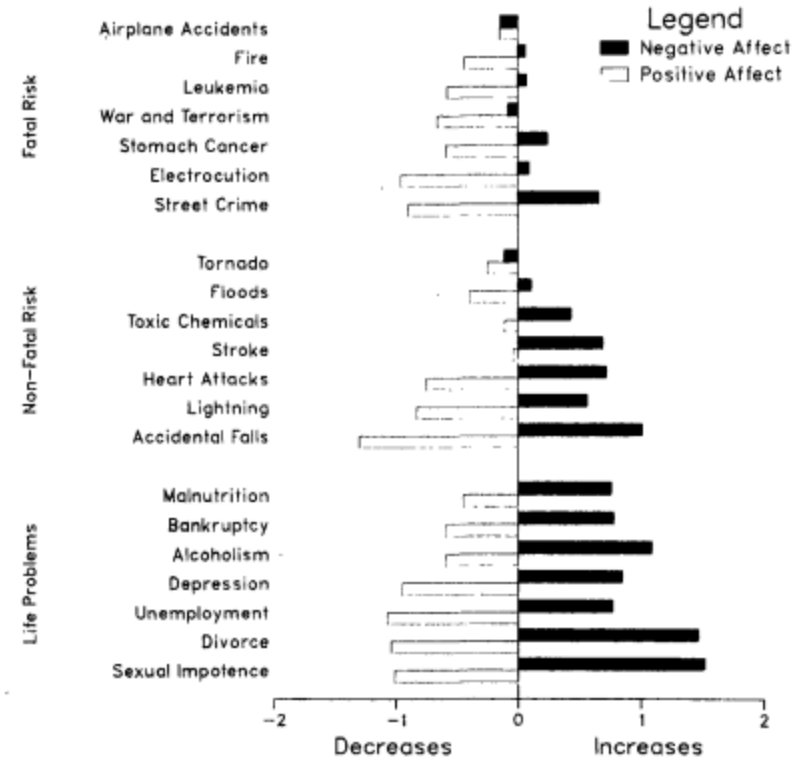

Figure 3. Increases and decreases (log scale) in estimated frequency, relative to control, induced by positive or negative affect for each of 21 risks.

September 11's indirect toll: road deaths linked to fearful flyers

German professor estimates an extra 1,595 Americans died in car accidents in year after September 11 attacks

▲ Traffic in New York. Road use jumped after the September 11 attacks. Photograph: Mario Tama/Getty Images

The official death toll for the September 11 attacks stands at 2,996, including the 19 hijackers, but research suggests that there is a further, indirect toll as a result of behavioural changes induced by fear.

In the months after the 2001 terror attacks, passenger miles on the main US airlines fell by between 12% and 20%, while road use jumped.

The change is widely believed to have been caused by concerned passengers opting to drive rather than fly. Travelling long distances by car is more dangerous than travelling the same distance by plane.

next week

- social cognition!

Here are the to-do's for the week:

- Week 11 Exit Ticket (due Thursday)
- Week 11 Quiz (due Sunday)
- Project Milestone 3 (Argument) (due Monday)
- Post any lingering questions here
- Extra credit opportunities:
  - Submit Exra Credit Questions (1 point for 8 submissions)
  - Submit Optional Meme Submission (1 point for winners!)

Before Tuesday

- Complete W12 Activity 1

Before Thursday

- Complete W12 Activity 2

After Thursday

- See the Apply section