How do emotions affect cognitive processes?

Clore & Huntsinger, 2007

- The "Affect-as-Information" Hypothesis, important for person/object evaluation
  - Affect serves as an indicator of the value of "goodness/badness" of the stimulus

- The "Affect-as-Information" Hypothesis, important for a person's own cognitions/inclinations

biases

Person / Object Evaluation

- Theory typically suggests that our cognitive evaluations determine our perceived goodness/badness of an object
- But our feelings act as an important piece of information in our evaluation of others/objects
  - Films which elicit positive affect increases our attraction to others, above and beyond our cognitions about the person (Gouaux, 1971)

Person / Object Evaluation

- Telephone survey (Schwarz & Clore, 1983): People reported significantly less life satisfaction on cold, rainy days relative to warm, sunny days
  - Misattribution (Schachter & Singer)!
  - Simply asking about the weather prior to assessing life satisfaction negated this effect

Important real-life effects?

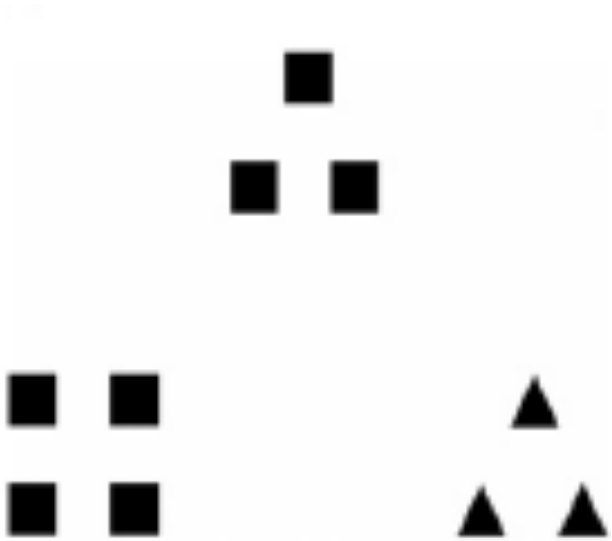
- Mock-Trial Research (Kadous, 2001): Increasing the *distress* a juror feels about a defendant's transgressions increases odds of finding the defendant guilty
- Simply asking the juror about their anxiety in making a decision mitigated this effect
  - Why? Distress was attributed to the decision rather than the defendant's actions

Not just judgment, but accuracy!

- Sad music makes people overestimate the incline of a hill
  - Similar to those wearing heavy backpacks
- Fear from standing on a skateboard on top of a hill causes people to overestimate incline
  - Relative to those on a stabilized board

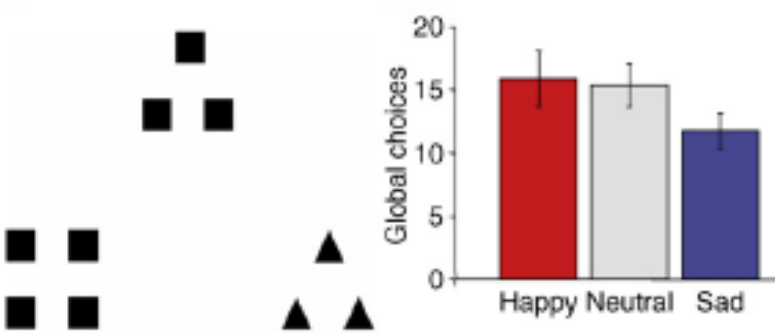
Global – Local Focus

- Highly anxious people adopt a more "local" focus, especially when experiencing state anxiety (Derryberry & Reed, 1998)



Global – Local Focus

- Gasper & Clore (2002) induced happy, sad, and neutral emotions in subjects
- They found:



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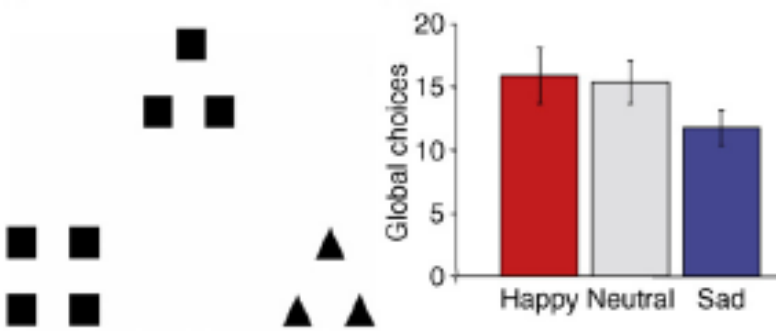


- Sad moods cause a more local focus
- Notice that happy and neutral are similar (typical finding)
  - Most people are happy!

Global – Local Focus

- Another global-local comparison is the evaluation of a person as a member of a group (stereotyping) or as an individual

- Consistent with past research, positive affect produces a more "global" evaluation
  - i.e., person as member of group, not as an individual

negative affect tends to be more evaluative

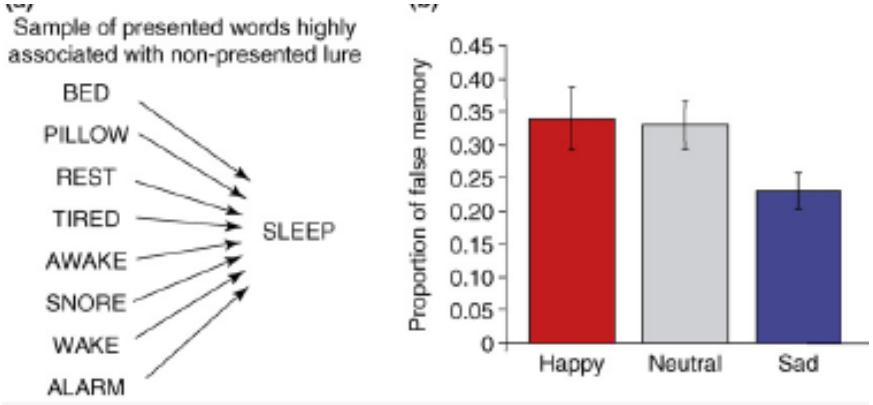
Stereotype bias

- People in happy moods more likely to convict person charged with stereotype-consistent offense (Fiedler, 2004)

- Happy moods cause people to rely on brand names relative to product attributes (Adaval, 2001)

False Memories

- Obvious important legal implications
- Assumed to reflect relational, or “gist” processing
- People in sad moods evidence fewer false memories than those in happy/neutral moods



Storbeck & Clore, 2005

Lerner et al. (2003)

- Past research:
  - Negative emotions increase risk perception
  - Positive emotions decrease risk perception
- As alluded to by Clore & Huntsinger, discrete emotions must be evaluated
  - Fear arises from and elicits appraisals of uncertainty and situational control
  - Anger → certainty and individual control

relationship between this & masculinity??

Lerner & Keltner (2000, 2001)

- The elicitation of fear subsequently produces:
  - Pessimistic risk estimates
  - Risk-averse choices
- The elicitation of anger subsequently produces:
  - Optimistic risk estimates
  - Risk-seeking choices
- Appraisals of certainty & control account for these effects

Problems

- Undergraduate sample
  - Better if representative sample used
- Participants often knowledgeable about research
- Performed in lab
  - May not be ecologically valid
- “real-life” scenarios may be better
  - More “generalizable”?

Paradigm

- Random sample of "Knowledge Networks" 75,000 members was notified about survey via e-mail
- Session 1: (September 20th, 2001)
  - 1,786 respondents answered questions about attacks
- Also completed:
  - Anxiety Subscale of Stanford Acute Stress Reaction Questionnaire
  - 4-item face valid "Desire for Vengeance" Scale (alpha = .69)

Paradigm

- Of the original sample, 973 completed Session 2
- Session 2: (November 10th,2001)
- Randomly selected to read either:
  - "The terrorist attacks evoked a lot of emotion in Americans. We are particularly interested in what makes you most (AFRAID/ANGRY) about the attacks. Write as detailed a description of that thing as possible. If you can, write your description so that someone reading it might even get (AFRAID/ANGRY) from learning about the situation."
- And see and hear actual CNN / NYT clips found to elicit fear or anger

Paradigm

- They then completed:
- Judgments of likelihood of future events in the US (rated from 0 [extremely likely] to 8 [extremely likely])
  - "Another major terrorist attack will occur within the next 12 months."

- The Risky Events and Precautionary Actions for Self/the Average American (rated from 0% [impossible] to 100% [inevitable]
  - Five related to terrorism; three related to routine tasks

Paradigm

- They then completed:
- An assessment of four possible government policies (1 to 4; strongly opposed to strongly support)

- Self-reports of several discrete emotions, in response to the emotion induction techniques

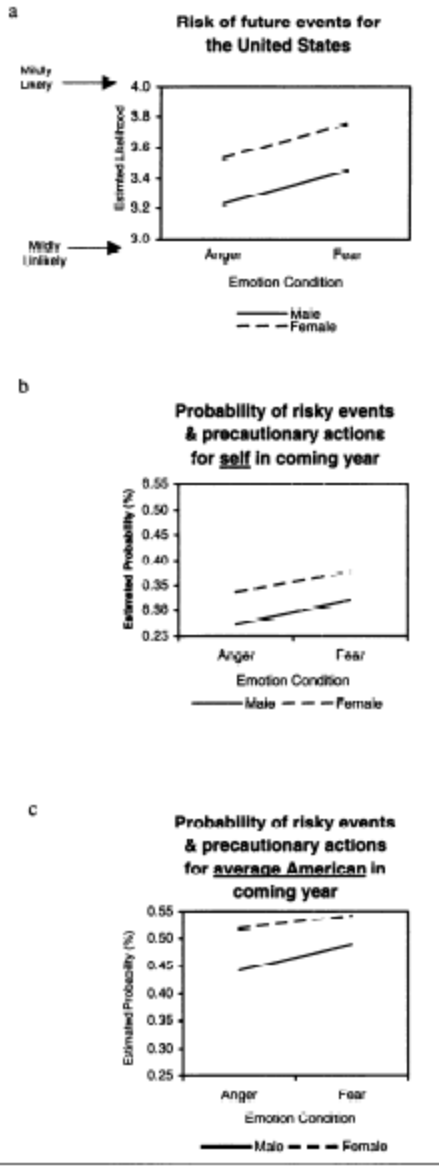
Benefits of Study

- Manipulation checks:
  - Fear induced fear and anger induced anger
- Sample:
  - Representative and demographically diverse
- Adolescents statistically equivalent to adults

Risk Perceptions

- Emotional induction impacted perception
  - Main effect: Fear elevates risk assessment
- 60-80% OF VARIANCE MEDIATED BY REPORTED FEAR/ANGER
- Also impacted by gender
  - Main effect: Woman have higher perception than men
  - This effect not completely mediated by differences in emotional responding
    - Emotion and gender influences risk judgment

true regardless of emotion manipulated



Amazingly?

- Naturally-occurring Session 1 emotions predicted risk assessments at Session 2! (controlling for induced emotion!)

Table 1. *Partial correlations between naturally occurring anxiety and desire for vengeance (measured soon after September 11th) and risk perceptions (measured 6–10 weeks later)*

Risk perception	Anxiety	Desire for vengeance
Risk of Future Events for the United States	.10*	−.16**
Risky Events and Precautionary Actions for Self	.24**	−.07†
Risky Events and Precautionary Actions for Average American	.13**	−.07†

Note. These correlations control for the nonfocal emotion (anxiety or vengeance, respectively), preexisting anxiety disorders, and political ideology. $N = 973$.
†$p \leq .08$. *$p \leq .05$. **$p \leq .001$. All p values are two-tailed.

Policy preferences

- Manipulation affected policy preferences as hypothesized . . .

Policy	Partial correlation with self-reported affect at Time 1[a]		Partial correlation with self-reported emotion at Time 2[b]		Mean response at Time 2		Test for mean difference between fear and anger at Time 2
	Anxiety	Vengeance	Fear condition	Anger condition	Fear condition	Anger condition	*t* (*df*)
General							
Provide Americans with honest, accurate information about the situation, even if the information worries people	.02	.02	−.01	.09*	3.47	3.43	−0.68 (634)
Invest in general capabilities, like stronger public health, more than a specific solution like smallpox vaccinations	.05	−.02	.09*	.02	3.58	3.47	−2.19* (635)
Emotionally responsive							
Deport foreigners in the U.S. who lack valid visas	−.06	.28**	−.12**	.26**	3.48	3.63	2.52* (634)
Strengthen ties with countries in the Moslem world	−.02	−.13*	−.02	−.09*	3.23	3.08	−2.17* (631)

Note. Policy response scales ranged from 1 (*strongly opposed*) to 4 (*strongly support*). $N = 973$.
[a]Time 1 emotions represent individual differences shortly after September 11th. Partial correlations between Time 1 emotions and policy questions control for the nonfocal Time 1 emotion (anxiety or vengeance, respectively), preexisting anxiety disorders, and political ideology.
[b]Time 2 emotions represent self-reported feelings in response to the emotion manipulations. Partial correlations between Time 2 emotions and policy questions control for the nonfocal emotion (fear or anger, respectively).
*$p \leq .05$. **$p \leq .001$. All p values are two-tailed.

This is also notable

- Risk perception is high for self- and average people (especially average people)
- Consistent finding

Table 3. *Respondents' probability estimates that within the next 12 months they and the average American would experience risky events and take precautionary actions*

Event or action	Scale	*M*	*SD*	Median
Being hurt in a terror attack	Self	20.5	22.5	10.0
	Average American	47.8	35.7	50.0
Having trouble sleeping because of the situation with terror	Self	23.5	29.5	10.0
	Average American	44.0	27.6	45.0
Traveling less than usual	Self	34.0	36.2	20.0
	Average American	53.9	25.3	50.0
Screening mail carefully for suspicious items	Self	53.6	38.8	50.0
	Average American	60.0	29.6	60.0
Taking antibiotics against anthrax	Self	22.1	30.3	5.0
	Average American	39.3	30.2	35.0
Getting the flu	Self	46.8	31.3	50.0
	Average American	59.5	29.2	50.0
Being the victim of violent crime (other than terror)	Self	22.0	22.9	10.0
	Average American	43.0	30.1	40.0
Dying from any cause (crime, illness, accident)	Self	35.0	34.3	25.0
	Average American	52.6	35.2	50.0
Average of all items	Self	32.3	18.7	30.4
	Average American	50.1	21.3	50.0

So . . . In the end:

- *Discrete* emotions matter . . .
- Across age ranges and demographic profiles . . .
- Using real-world events . . .
- With real-world implications!

Gable & Harmon-Jones, 2008

- Much research (Fredrickson) has found that positive affect broadens cognition (creativity) and attention

- Much of the emotion induction techniques likely low "approach motivation"
  - E.g., small gifts of candy, funny films, or recalling pleasant memories

High Approach Motivation

- Associated with enthusiasm or desire while approaching an attractive object (more "visceral")

- Due to its importance to reproduction, social attachment, and nutrition (ingestion of food, water), more focused attention should be observed!
  - NOT broader attention!

우와
개 졸려

여기서 잘수있겠음

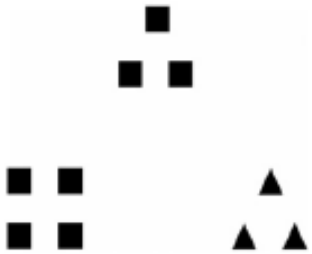
Consistent with goal-related affect

- Appetitive pre-goal PA relative to consummatory post-goal PA (Knutson & Wimmer, 2007)
- "Wanting" is different from "liking" (Berridge, 2007)

- Seeking, pre-goal PA facilitates reward acquisition (i.e., it is *motivating*)

Study 1

- Participants watched a neutral film of houses
- Then participants watched 1 of 2 films:
  - Low-approach cats in humorous situations
  - High-approach desserts
- They performed local-global task: “first and most immediate impression”



Study 1

- Last, they rated the film watched from 0 (no emotion) to 8 (strongest feeling):
  - Amusement
  - Anger
  - Anxiety
  - Contentment
  - Desire
  - Disgust
  - Engagement
  - Fear
  - Happiness
  - Interest
  - Sadness
  - serentiy

Study 1 Results

- Manipulation checks:
  - "Cats" more amusing than "Desserts"
  - Desserts more "desirable" than cats
  - Both more PA-inducing than "houses" film
  - Cats PA = Desserts PA

- Attentional focus was significantly more global after cats than desserts

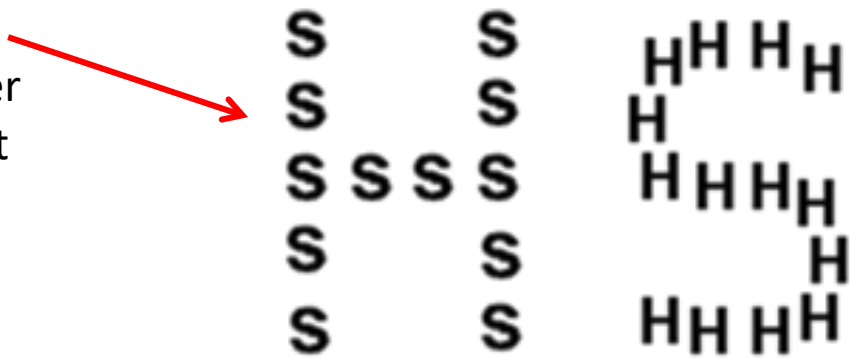
Limitations

- No neutral condition
- Does:
  - Low-approach PA broaden focus?
  - High-approach PA narrow focus?
  - Both?

Study 2

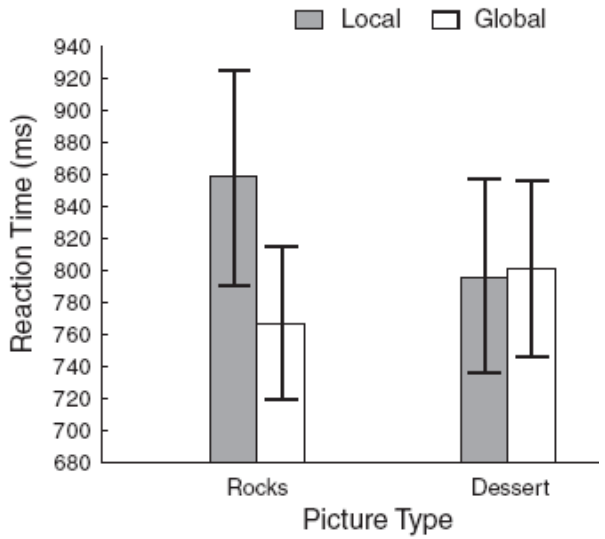
- Used pictures of rocks (neutral) and desserts (high-approach PA)
  - Matched for color, size, and brightness
- Then used Navon Letters: “indicate as quickly as possible” whether the picture contained the letter T or the letter H

More local focus will produce faster responses to right stimulus than left



Study 2 -- Results

- Dessert pictures more pleasing/desirable than rock pictures
- RT to global/local targets slower/quicker after dessert pictures than rock pictures

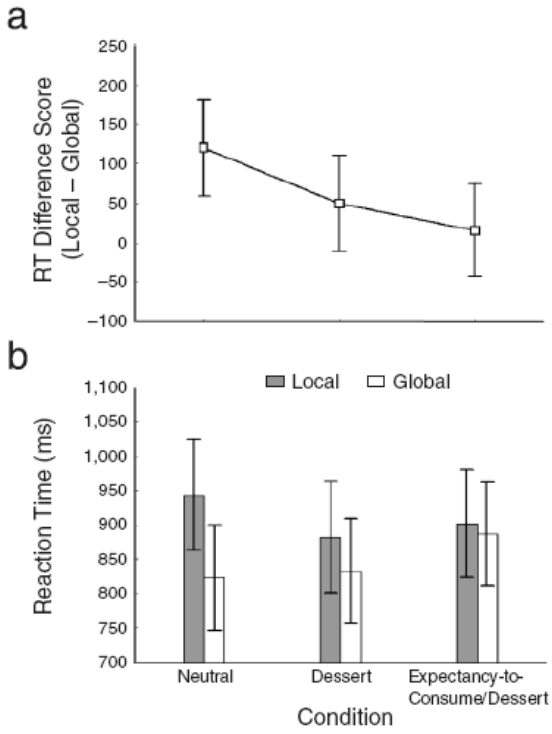


Study 4 – Expectancy to Act

- Past research shows that expectancy increases approach motivation
- Manipulated people's expectation that they could consume the desserts they saw
- 3 groups:
  - All saw 6 neutral pictures
  - 2/3 saw 36 dessert pictures; 1/3 saw neutral pictures (paper plates)
    - Half of these given expectation that they would be able to consume the desserts; half no expectation
- Navon's letters

Study 4 – Results

- Expectancy was most narrow in the expectancy-to-consume dessert, followed by dessert, followed by neutral



So . . .

- PA does not broaden . . .
- Rather, approach motivation narrows
- Many ways to alter approach motivation
  - External stimuli
  - Expectancies
  - Emotion regulation (reappraisal)?

Jon Cohen article (2005)

- Emotions affect us
- “Irrational” decisions may now be viewed via brain imaging technologies
  - Moral reasoning
  - Economic decision-making (2)
  - Placebo effects (we will skip this)
- Although the brain subserves various functions which typically work in concert, sometimes these functions counteract one another

Brain Systems

- Emotional
  - "Automatic"
  - Evolutionarily old
  - Highly conserved (don't change much over time)
  - Well-adapted for *specific* purposes (snake, sex)

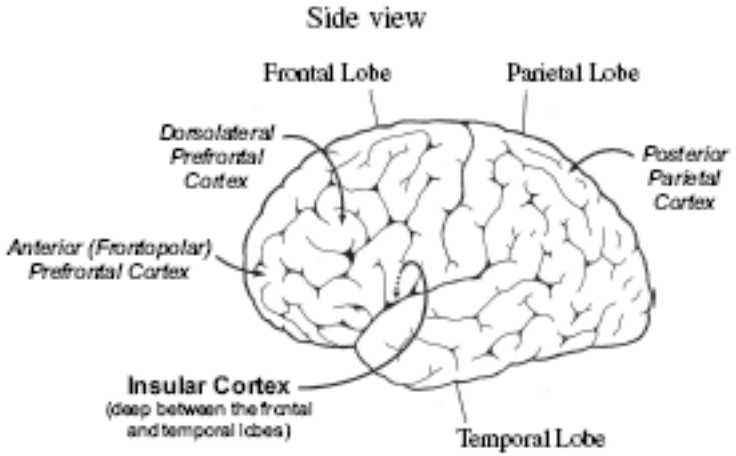
Brain Systems

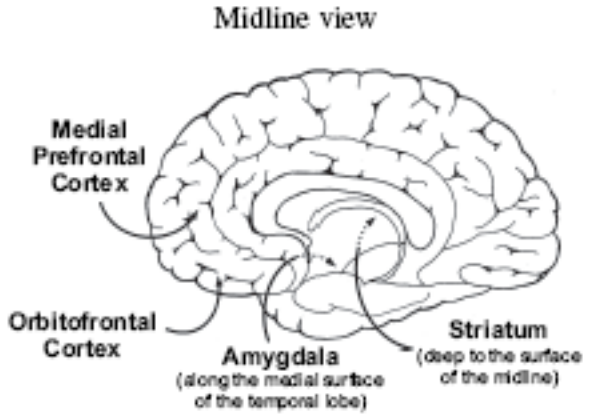
- Cognitive
  - "Controlled"
  - Extremely limited (process 1 or 2 things at a time)
  - More adaptive; supports a broad range of goals

System 1 and System 2

- System 1:
  - Automatic processing; more emotional in nature
- System 2:
  - Controlled processing; monitors the answers of System 1, and corrects/overrides it when necessary

Brain structures





Notes: Lateral (side) and medial (midline) views of the human cerebrum, identifying areas critically associated with decision making. Areas in bold have consistently been associated with emotional processing, while areas in italics have consistently been associated with higher level cognitive processes (see text).

Bold = emotional
Non-bold = cognitive

What is rationality?

- The central conjecture: People should behave in ways to optimize their utility
  - But they often don't (Kahneman & Tversky, etc.)

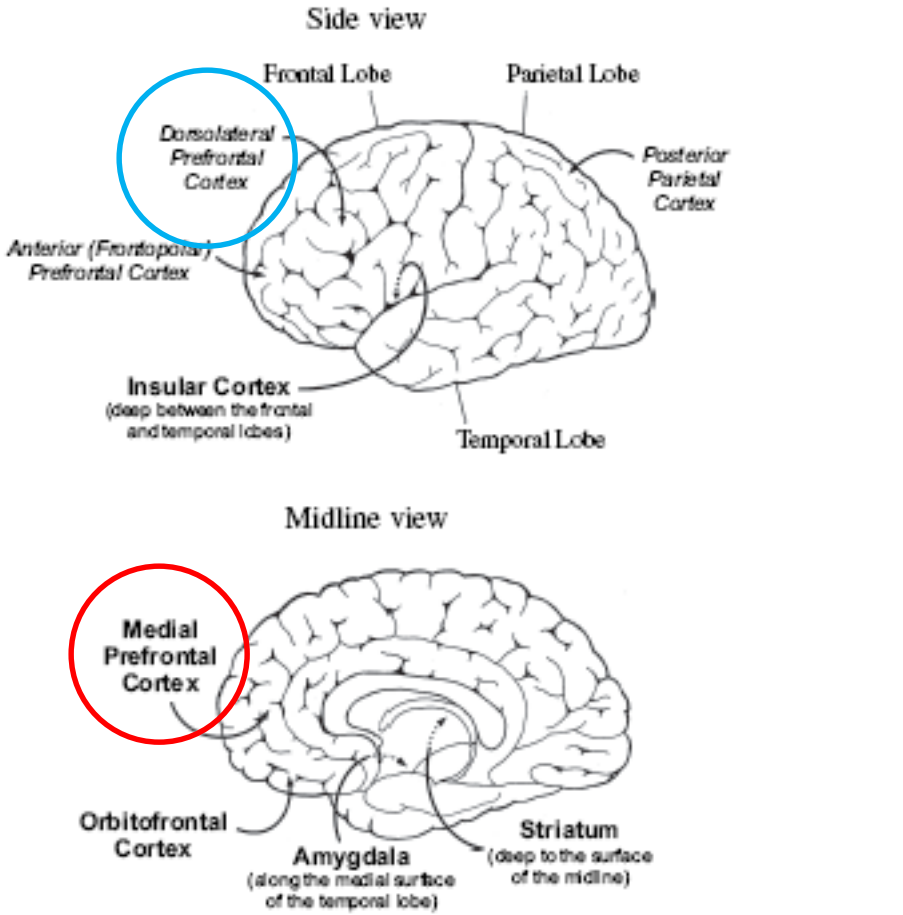
- Why? Either:
  - Theorists aren't creative enough to understand people's utilities, or
  - People are incapable of optimizing utilities
    - Computational limitations, memory limitations, etc.
  - System 1 and System 2 are competing; individual differences explain behavior
    - Can now view with PET (glucose) and fMRI (oxygen)

Study 1: Moral Reasoning

- Switch Scenario
  - Most say it's ethical to pull switch
- Footbridge Scenario
  - Most say it's unethical to push bystander

- Why the distinction, despite mathematical equivalence? Emotions evoked

Moral Dilemmas (Switch v. Footbridge)



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Economic Decision-Making: The Ultimatum Game

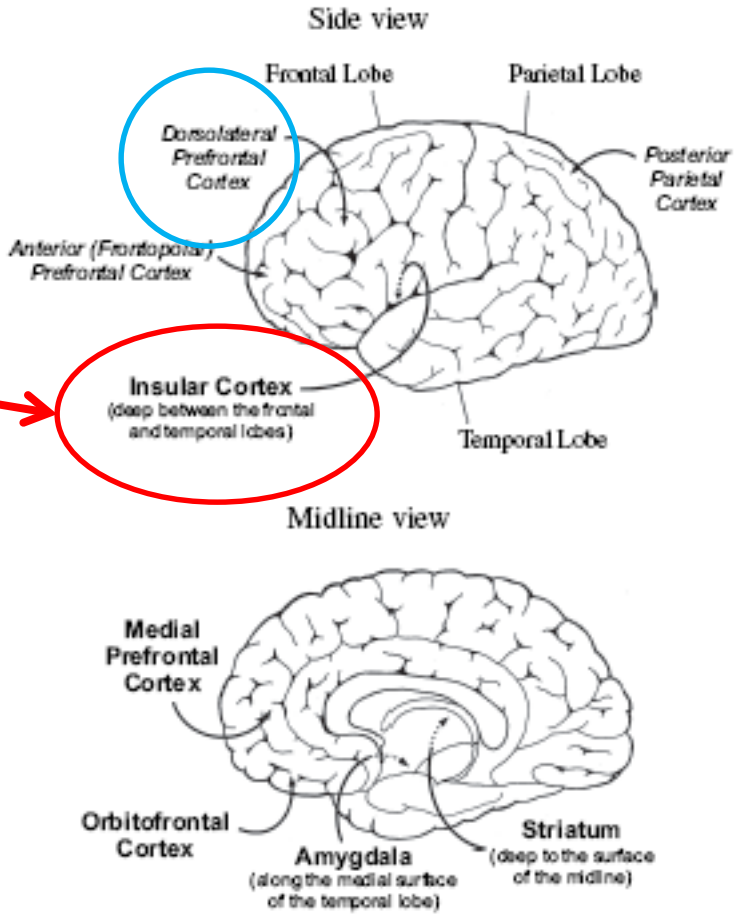
- Partner proposes split of $10
  - If accepted, both get money
  - If rejected, neither gets money

- If partner offers <20%, the sum is routinely rejected
  - Even if pay is ~1mo pay!
  - Even in “1-shot” games, where there is no strategy!

- Counter to classical economic theory
  - Something is better than nothing!

Ultimatum Decision (Agree v. Reject)

Activated to physical
Pain and disgust



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Intertemporal Choice

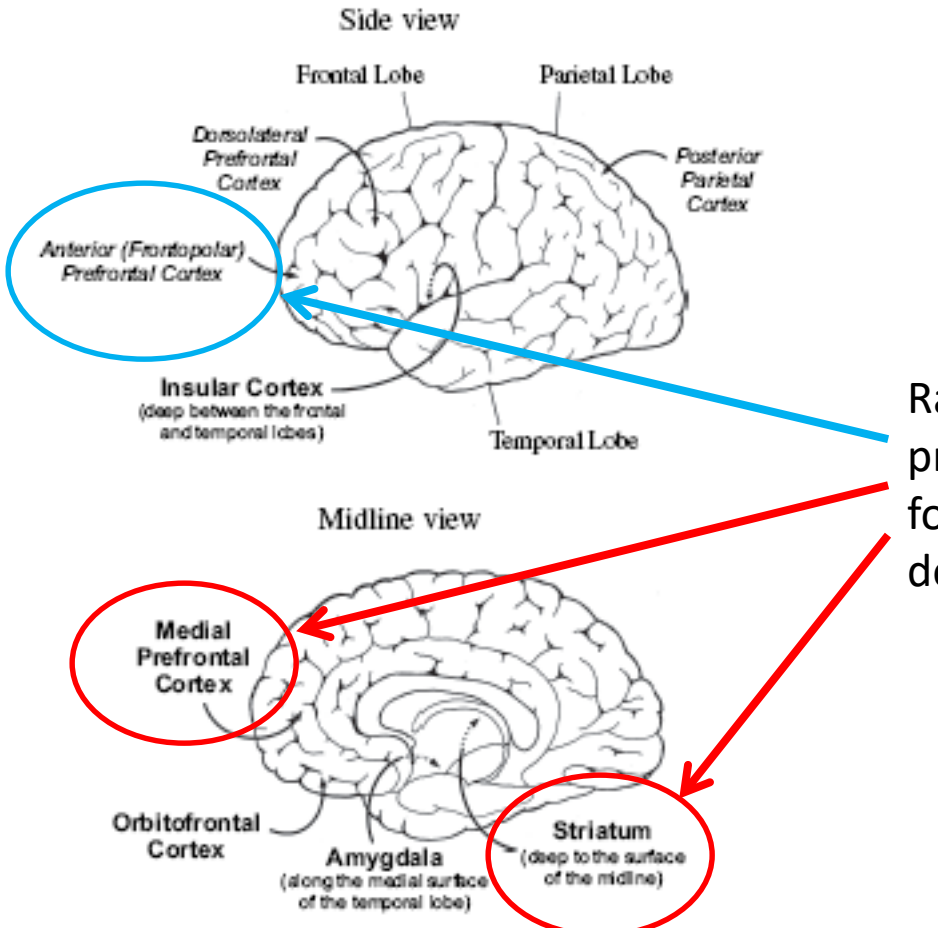
- Decisions between earlier versus delayed rewards
  - People prefer immediate rewards
- Prefer $10 today instead of $11 tomorrow
- Prefer $11 in 1 year + 1 day relative to $10 in a year
  - Evidences value-added of immediate gratification
- Why? Emotion!

Intertemporal Choice (Delay v. Immed)

Related to value
Of future
rewards

Important for
Reinforcement
learning

DA neurons
- reward



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Ratio of activation
predicted preference
for immediate versus
delayed rewards

So . . .

- Emotions affect decisions
- Although we may not have conscious access to emotional and/or cognitive processes, brain imaging may be helpful to understanding behavior
- “Irrational” responses may result from competing brain functions
  - Evolutionary by-products which may be less than adaptive today