

Psychology and Economics¹

14.13 Lectures 21: Poverty through the lens of psychology

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¹Some of these slides are based on notes by Sendhil Mullainathan. I would like to thank him, without implicating him in any way, for sharing his materials with me.

Plan for lectures today

- Overview of psychology of poverty
- Scarcity (Mani et al., 2013)
- Poverty entails many other deprivations (Schilbach et al., 2016)

(Seemingly) sub-optimal behaviors among the poor

- Investment/saving
- Credit
- Parenting
- Productivity
- Punctuality
- Medical adherence
- Food and drug consumption
- ...

What explains these behaviors?

- Environmental conditions
 - Transportation
 - Predatory lending
 - Institutional structure (defaults)
 - ...
- Selection/omitted variables
 - Education
 - Intelligence
 - Effort
 - Mistakes
 - ...
- **Treatment effect of poverty**
 - Poverty *itself* causes these behaviors.

A 'behavioral' poverty trap?

- Broad line of argument:
 - Poverty affects cognition, decision-making, and productivity.
 - These factors in turn influence future poverty.
 - This makes it difficult if not impossible for a poor person to get rich.
- Today: two broad lines of research:
 - (I) Scarcity: Mullainathan and Shafir (2013)
 - Monetary concerns capture cognitive function.
 - (II) Other poverty-induced deprivations and behaviors
 - Pain, sleep deprivation, stress, excessive drinking, heat, noise, pollution
 - Mental health: stress, depression, (lack of) hope, aspirations

A test

- Let's do a memory test.
- I'll read you a list of word.
- Do not take notes while I read the list!
- Once I am done, write down as many words as you remember.

Which words do you remember?

- Bed
- Rest
- Dream
- Doze
- Snore
- Slumber
- Sleep
- Blanket
- Snooze
- Wake
- Nap
- Awake
- Tired

False memories

False memories

rest

False memories

rest

awake

False memories

rest

awake

slumber

False memories

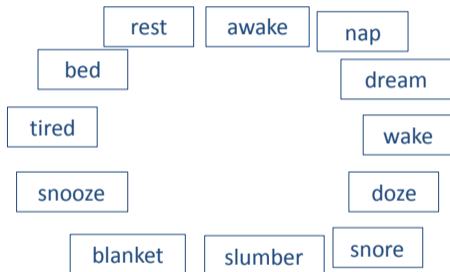
rest

awake

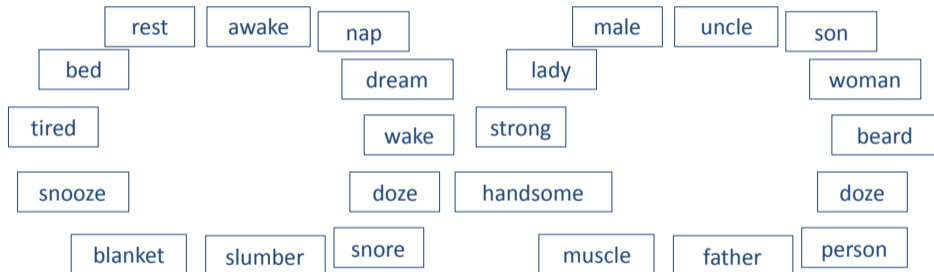
snooze

slumber

False memories



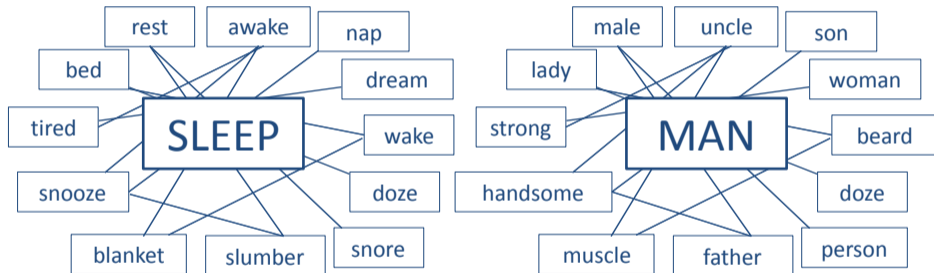
False memories



False memories

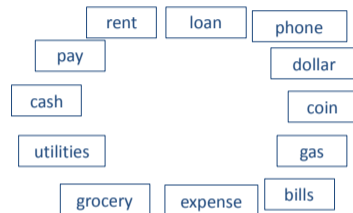


False memories

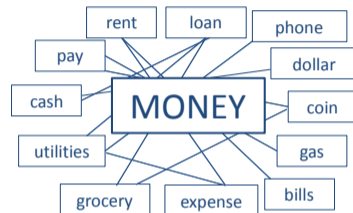


Motivating study 1: False memories: rich vs. poor

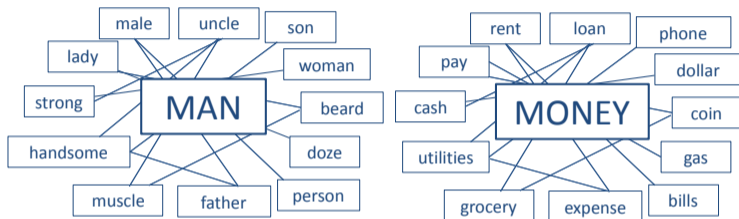
Motivating study 1: False memories: rich vs. poor



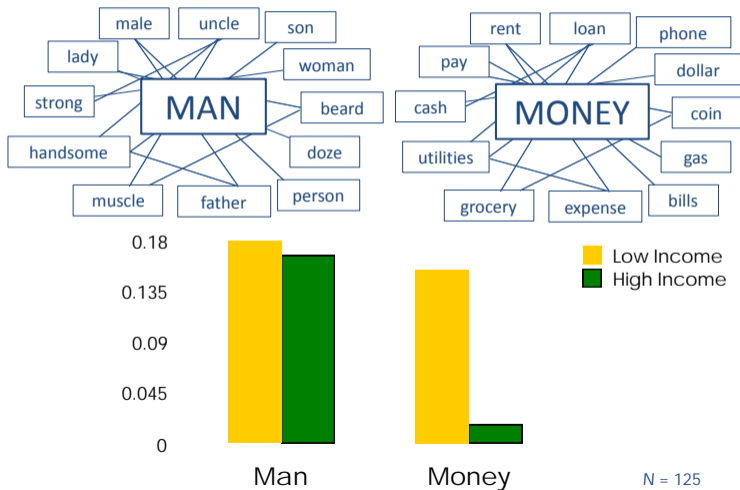
Motivating study 1: False memories: rich vs. poor



Motivating study 1: False memories: rich vs. poor



Motivating study 1: False memories: rich vs. poor



Motivating study 2: A doctor's visit

Imagine that you have been feeling sick lately and finally decide to go see a doctor about it...The doctor explains that you have a serious condition that requires immediate attention. The good news, however, is...you are virtually guaranteed to make a full recovery...The doctor writes several prescriptions...You will also need to make several appointments...

What would be on your mind or how would you feel as you hear this news... What are three things you would think about or feel?

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“wife son coworker”

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“wife son coworker”

“scared afraid worried”

“relief hope joy”

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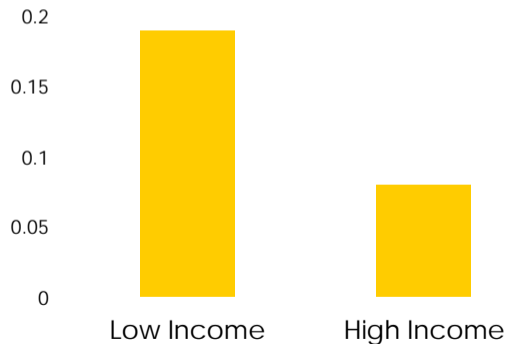
“scared afraid worried”

“relief hope joy”

“cost family work”

Motivating study 2: A doctor's visit

Proportion mentioning money-related thoughts



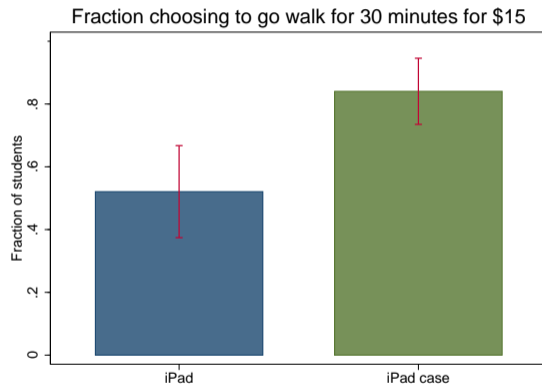
N = 198

Motivating study 3: Travel for a sale

*Imagine that you are about to purchase **an iPad for \$500**. The salesman tells you that you can get the exact same good in a nearby location for \$15 off. You would need to walk for 30 minutes in total. Would you go to the other store?*

*Imagine that you are about to purchase **an iPad case for \$30**. The salesman tells you that you can get the exact same good in a nearby location for \$15 off. You would need to walk for 30 minutes in total. Would you go to the other store?*

How much are 30 minutes of walking worth?



- Studies found this effect in many settings, but not (or less so) with the poor.

Summary

- Thoughts about money capture the poor's minds (studies 1 and 2).
- The extra focus on money has some positive consequences (study 3)
- What are the negative implications?

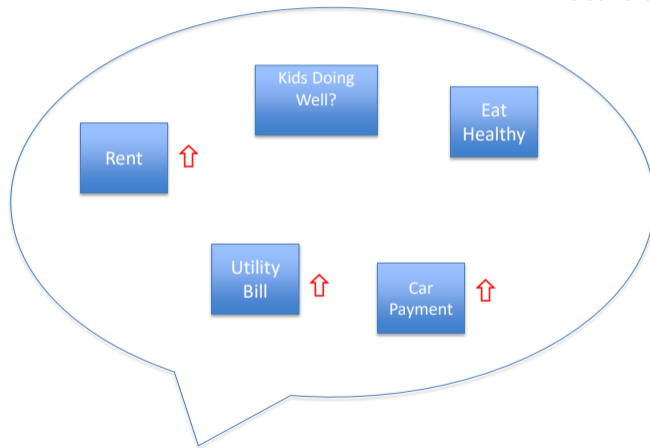
Mullainathan and Shafir (2013): scarcity

- Scarcity: not having enough of something²
 - Money, time, friends, hair, etc.
- Scarcity *captures* mental cognitive capacity ('bandwidth').
 - Happens automatically
 - *Not* intentional
- Poverty makes monetary concerns top of mind.
 - Implies that the poor act more rational in financial choices
 - Greater focus and improved decision making (Shah et al., 2015)
- But overall cognitive capacity is limited.
 - Scarcity deteriorates performance at other cognitive tasks.

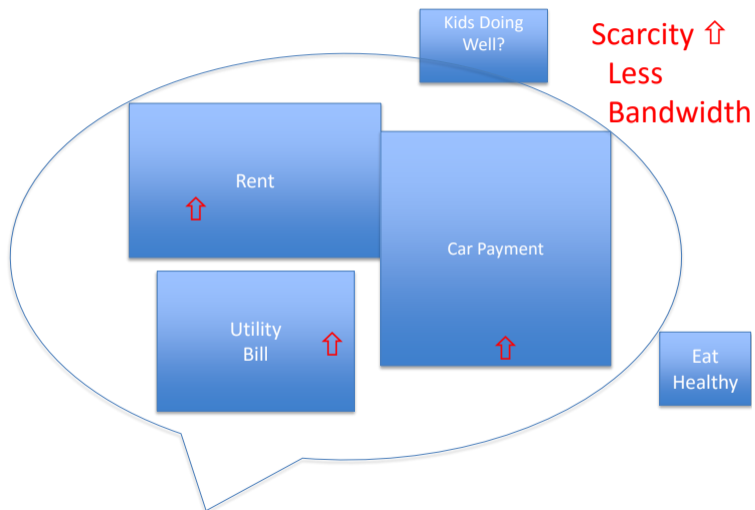
²See a more eloquent version by Sendhil Mullainathan [HERE](#)

Scarcity top of mind

Scarcity ↑



Scarcity top of mind



Poverty impedes cognitive function I: the mall study



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Design

- Four 'lab' experiments with shoppers at a New Jersey mall
- Diverse income range
 - Median household income at roughly \$70,000
 - Lowest income roughly \$20,000
- Sequence of events
 - (1) Ask hypothetical questions involving money (hard or easy)
 - (2) Conduct cognitive (non-verbal) tests
 - Fluid intelligence (Raven's Matrices)
 - Cognitive control (Hearts and Flowers)
 - (3) Answer hypothetical questions

Timeline

Hypothetical Question

“Your car is having some trouble and requires \$X to be fixed. You can pay in full, take a loan, or take a chance and forego the service at the moment... How would you go about making this decision?”

Hard (1500 to fix)
or Easy (150 to fix)

Ravens/Executive Function

Answer Hypothetical Question

The poor do worse after 'hard' task.

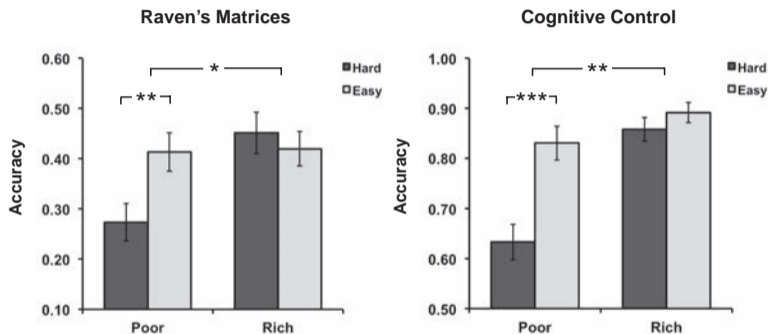


Fig. 1. Accuracy on the Raven's matrices and the cognitive control tasks in the hard and easy conditions, for the poor and the rich participants in experiment 1. (Left) Performance on the Raven's Matrices task. **(Right)** Performance on the cognitive control task. Error bars reflect ± 1 SEM. Top horizontal bars show two-way interaction (poor versus rich \times hard versus easy). * $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Poverty impedes cognitive function II: harvest study



Design

- Why do another study?
 - External validity concerns
 - How do we interpret the magnitudes? Do the effects persist after repeated exposure?
- Sample
 - 464 sugarcane farmers living in 54 villages in Tamil Nadu
 - Small-scale farmers earn at least 60% of income from sugarcane
 - Harvest staggered over 3- to 5-month period set by sugar mills (capacity constraints).
- Expenditure cycles: Sugarcane harvest cycle takes 18 months.
 - Farmers are relatively poor pre-harvest.
- Comparison of cognitive performance pre- vs. post-harvest

Farmers' financial situation is worse pre-harvest.

Dependent variable	Full sample: Household + time fixed effects	Subsample: Farmers who completed harvest, but had not received payment
Panel A		
	Column 1	Column 2
Belongings pawned (last 15 days: 0 = no, 1 = yes)	-0.566*** [0.058]	-0.598 [0.058]
Observations	924	630
Mean: 0.41 (0.78 pre-harvest, 0.04 post-harvest)		
Loans outstanding (0 = no, 1 = yes)	-0.885*** [0.033]	-0.899 [0.032]
Observations	922	626
Mean: 0.56 (0.99 pre-harvest, 0.13 post-harvest)		
Number of loans outstanding	-1.979*** [0.105]	-2.033*** [0.106]
Observations	920	626
Mean: 1.22 (2.28 pre-harvest, 0.15 post-harvest)		
Ability to cope with ordinary bills in the past 15 days (1 = low; 3 = high)	0.111*** [0.049]	0.109*** [0.050]
Observations	924	630
Mean: 1.69 (1.62 pre-harvest, 1.76 post-harvest)		

Farmers' cognitive performance is worse pre-harvest.

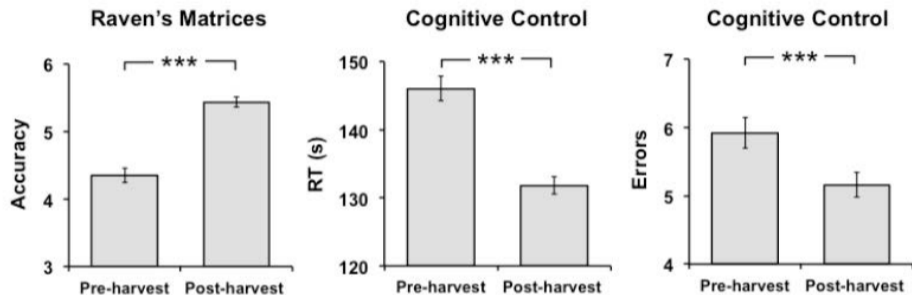


Figure 4: Cognitive performance of Sugar Cane Farmers in Field Study. Left panel shows performance on Raven's Matrices task. Middle and right panels show Stroop task (measuring cognitive control) response times (RT) and error rates, respectively; Error bars reflect ± 1 SEM. Top horizontal bars show test for main effect of pre vs. post harvest (***) $p < .001$.

Confounds?

- Calorie consumption
 - Only small difference in food expenditures in pilot study (2009)
 - Rs. 2,663 a month on food pre-harvest vs. Rs. 2,592 post-harvest
- Anxiety over uncertainty of harvest size
 - Similar results for post-harvest, pre-payment sample (see next slide)
- Labor effort
 - Similar results for post-harvest, pre-payment sample (see next slide)
- Learning effects
 - Hold-out sample takes cognitive tests for first time post-harvest.
 - Don't perform worse than people who do tasks for the second time
 - Seems underpowered.

Post-harvest, pre-payment sample

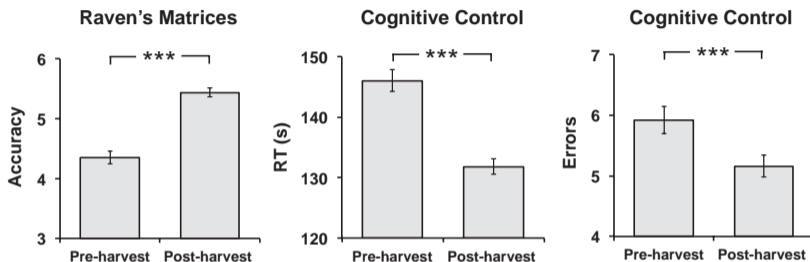


Fig. 4. Accuracy on the Raven's matrices and the cognitive control tasks for pre-harvest and post-harvest farmers in the field study. (Left) Performance on Raven's matrices task. **(Middle and Right)** Stroop task (measuring cognitive control) response times (RT) and error rates, respectively; error bars reflect ± 1 SEM. Top horizontal bars show test for main effect of pre- versus post-harvest ($***p < 0.001$).

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- Post-harvest, pre-payment sample
 - These farmers have harvested (and exerted labor effort).
 - They also know harvest size (and therefore approximate payment).

Follow-up work

- Carvalho et al. (2015)
 - Cognition & decision-making of US households around paydays
 - No cognitive effects whatsoever
 - External validity issue?
- Lichand and Mani (2020)
 - Application to drought insurance
 - Potential additional value of insurance
 - Reduced worries about money ex ante, in *all* states of the world

Do these cognitive effects translate into future poverty?

- Kaur, Mullainathan, Oh, Schilbach (2019)
 - Does scarcity affect economic decisions? Does scarcity affect productivity?
- Randomized field experiment with workers in Odisha. Two treatments:
 - (1) Variation in payments (some people paid earlier than others)
 - (2) 'Salience' intervention similar to Mani et al. (2013)
- Main finding:
 - Receiving early payment makes workers more productive
 - Largest impacts for the poorest workers

Can cash transfers unlock a poverty trap?

- Scarcity results suggest potentially high returns to (un)conditional cash transfers.
 - Giving money to the poor might have additional benefit of enhancing their cognition.
 - Possibility of self-sustaining virtuous cycles due to one-time transfer
- Banerjee et al. (2015): ultra-poor program leads to large sustained increases in assets, savings, consumption, etc.
 - Effects larger than one would expect from investment of return of the asset by itself
 - Did the intervention unlock a poverty trap?
 - Possible channels: reduced scarcity and stress, improved mental health

Other poverty-induced deprivations

- Poverty entails other deprivations beyond money, including:
 - Malnutrition
 - Higher levels of stress
 - Sleep deprivation
 - Noise and environmental pollution; heat
 - Stigma, social exclusion
 - Substance abuse
 - Mental ill-health
- Research in other fields often establish the impact of each of these deprivations on health and cognitive function (Dean et al. 2018)

Poor Sleep



Image by Rajiv Ashrafi on [flickr](#). CC BY-NC-SA

Bessone et al. (2020)

(1) Objectively measure sleep quantity and quality in Chennai

- Document severe sleep deprivation and alarmingly low quality of sleep

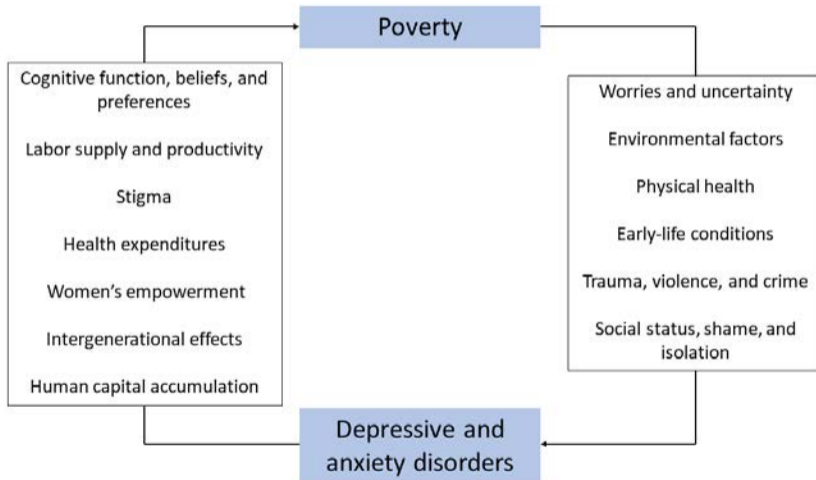
(2) Evaluate interventions to increase sleep

- Night-sleep treatments: Providing information, sleep devices (+ incentives) increases night-sleep quantity by 20 (33) minutes per night, but does not improve quality
- Nap treatment: Offering naps at the office increases sleep quantity and quality

(3) What are the impacts of increasing sleep?

- Night-sleep treatments: No effects on productivity, cognition, well-being, preferences. *Decreases* in labor supply.
- Nap treatment: Increases in productivity, attention, well-being, patience
- Evidence that marginal benefits of sleep depend on sleep quality

Ridley et al. 2020: Poverty and common mental disorders.



What's next?

- Wednesday (May 6): Happiness and mental health
 - Please read Kahneman and Deaton (2010)
- Monday (May 11): Policy with behavioral agents
 - Please read Thaler and Sunstein (2003)

Guest lecture on happiness and mental health (May 6)



References used in this lecture I

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