Temptation and Self Control: Evidence

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- A sketch of the theoretical conclusions
  - People who suffer from temptation and who are
    - Certain about the future
    - Sophisticated

  Should exhibit preferences for commitment
  - Non-exponential discounting should lead to
    - Preference reversals in intertemporal choice
    - Preference for commitment

- In this lecture we will talk about the evidence for
  - Preference for commitment
  - Preference for flexibility
  - Preference reversals in discounting experiments
  - The link between the two
  - Sophistication

- Do we see much evidence for 'Preference for Commitment' in the field?
- Arguably not much
- Some evidence for 'informal' commitment devices
  - New year's resolutions
  - Joining a gym
  - ROSCAs
- Most formal commitment devices have been generated by behavioral economists
  - Stiikk
  - Beeminder
  - SMART
- And are relatively small in scale
  - e.g. Stickk has 329,000 'commitments'

Can We Generate A Preference for Commitment?

- Two examples:
- Lab: "Temptation and commitment in the laboratory," [Hauser et al 2010]
  - See also "Eliciting temptation and self-control through menu choices: a lab experiment" [Toussaert 2015]
- Field: "Self Control at Work" [Kaur et al 2015]
  - See also ""Tying Odysseus to the Mast: Evidence from a Commitment Savings Product in the Philippines," [Ashraf et al 2006]

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- Basic set up: Counting Task

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  - Counting task appeared every 1, 2 or 3 minutes
  - Experiment lasts 2 hrs
  - Subjects earn $15 if they get at least 70% of all counting tasks correct
  - (This is a really unpleasant task)
- Every so often, (and to their surprise) subjects would face a temptation screen

- Offered the chance to quit the task and surf the internet
  - Would only get a fraction of the $15
- Could also choose to 'commit' to not surfing
  - Pay some amount (possibly $0) not to see any more temptation screens

Phase	Duration	Number of counting tasks	Number of temptation screens	Commitment cost [in $]	Final payoff if surfing [in $]	Additional payoff for counting to end of experiment [in $]
0	30 min	15	0			
1	45 min	12	6	C	P_1	$W_1 = 15 - P_1$
2	45 min	12	6	C	P_2	$W_2 = 15 - P_2$
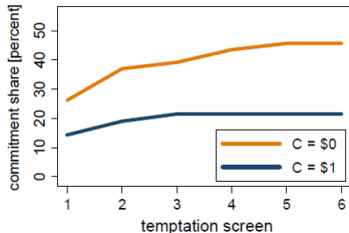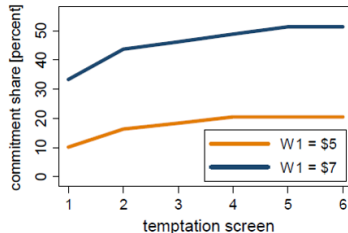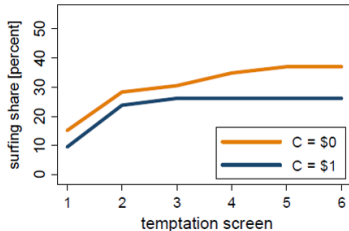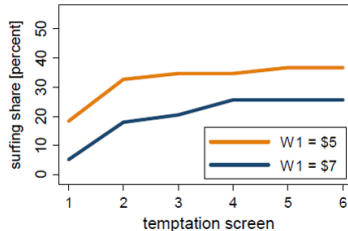
Temptation and Commitment in the Laboratory

- There are subjects who prefer commitment (40%)
  - Though few are prepared to pay for it (20%)
- Higher rewards lead to more preference for commitment
  - What one would expect if the pay enters u but not v
- Evidence of 'strict set betweenness'?
  - Subjects will ignore temptation and choose commitment
- Inefficient dynamics:
  - If you are going to pay for commitment, should pay for it straight away
- But there are problems with the design
  - Unmodelled dynamic problem
  - Subjects surprised by surfing screen
  - Temptation and commitment offered at the same time

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- Consider a job in which you get paid piece rate
  - Paid only at the end of the week
- What is the effect of temptation (e.g. quasi hyperbolic discounting)?
  - Pay day effects: work harder when reward is immediate
  - May work less hard in period $t+1$ than would like in period t: Creates a demand for commitment
- Test this using an experiment with a data entry firm in Mysore, India

Figure 2: Production over the Pay Cycle
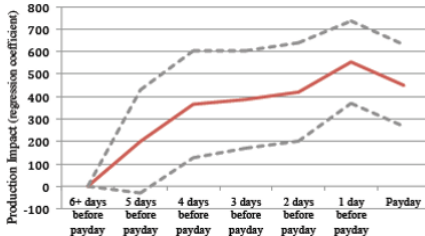
- 102 workers over 8 months
- Number of additional fields (over a base of about 5000)
- Size of effect inconsistent with discounting
- Gradual slope: incommensurate with quasi-hyperbolic discounting?
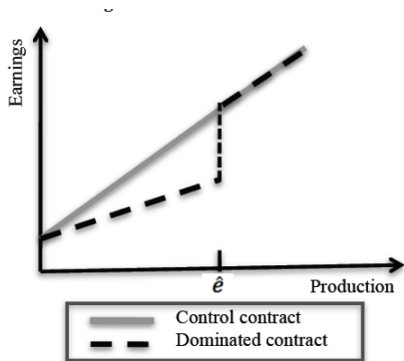
- Dominated Contracts: Reduce pay if target is not met
- A form of commitment, as it removes the possibility of producing less than the target at the same pay

Table 3

Contract Treatments

Panel A: Take-up of Dominated Contracts (Summary Statistics)	
Dominated contract chosen: conditional on attendance	0.36
	(0.31)
Dominated contract chosen: target=0 if absent	0.28
	(0.26)

- In some weeks, workers offered the chance to choose a target b
- Receive half pay if fail to hit target
- t=0 the same as the standard contract

	Panel B: Treatment Effects of Contracts			
	Dependent variable: Production			Dependent var: Attendance
Sample	Control & Option Obs	Control & Option Obs	Full Sample	Full Sample
	(1)	(2)	(3)	(4)
Option to choose dominated contract	120 (59)**			
Evening option to choose dominated contract		156 (69)**	150 (69)**	0.01 (0.01)
Morning option to choose dominated contract		84 (69)	73 (69)	-0.00 (0.01)
Target imposed: Low target			3 (90)	-0.00 (0.01)
Target imposed: Medium target			213 (91)**	-0.01 (0.01)
Target imposed: High target			334 (150)**	-0.01 (0.02)
Observations: worker-days	6310	6310	8423	8423
R2	0.60	0.60	0.59	0.15
Dependent variable mean	5311	5311	5337	0.88

- Targets increased output
  - If they were self imposed (columns 1 and 2)
  - Exogenously imposed (3)
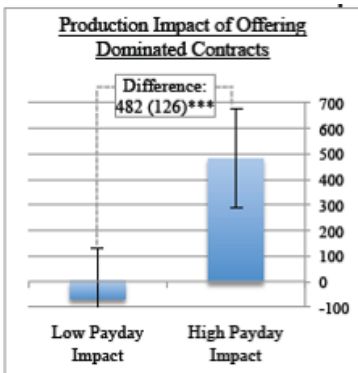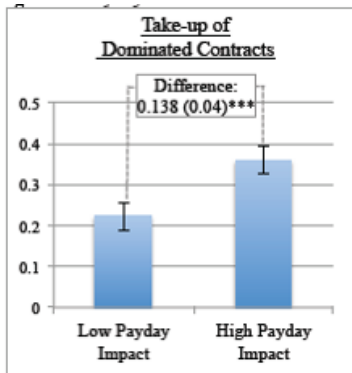
- Those with high payday impacts more likely to take up dominated contract
- Output also more affected
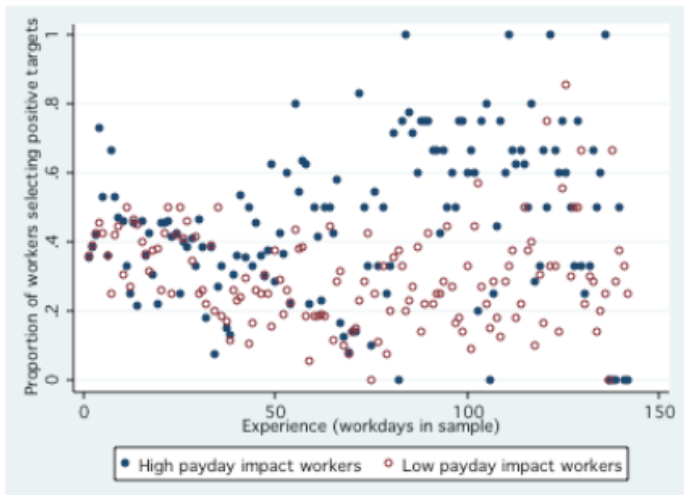
- Those with high payday impacts also chose the dominated contract more with experience

- So we **can** generate preference for commitment
- But (perhaps) surprisingly little of it
- Why?
- (At least) two possibilities
  - Preference for Flexibility (Discuss this now)
  - Lack of sophistication (Discuss after we have talked about time preference experiments)

- Preference uncertainty is the enemy of preference for commitment
    - Creates preference for flexibility
- Can we find evidence for preference uncertainty?
    - Dean and McNeill [2015]

- Simulated workplace environment
- Subject perform real effort tasks for payment according to payment contracts
  - Choice from menus
- Subjects choose between different payment contracts
  - Choice between menus

- Simple addition tasks

Task 3

422 + 538 =

Entry: |

Time remaining in section: 13:43.

Contract 11

Tasks completed	Payment
0-4	0.00
5-9	0.00
10-14	0.00
15-19	0.00
20-49	0.20
50+	0.20

Contract 25

Tasks completed	Payment
0-4	0.00
5-9	0.00
10-14	0.00
15-19	0.00
20-49	0.00
50+	0.40

Contract 24

Tasks completed	Payment
0-4	0.00
5-9	0.00
10-14	0.00
15-19	0.00
20-49	0.20
50+	0.40

- Low (L), High (H) and Flex (F)

- Each contact offers two or three undominated options

Tasks	0	20	50
Payment	0	20	40
L	Yes	Yes	No
H	Yes	No	Yes
F	Yes	Yes	Yes

- Note that $F = L \cup H$

Contract 25		Contract 24	
Tasks completed	**Payment**	**Tasks completed**	**Payment**
0-4	0.00	0-4	0.00
5-9	0.00	5-9	0.00
10-14	0.00	10-14	0.00
15-19	0.00	15-19	0.00
20-49	0.00	20-49	0.20
50+	0.40	50+	0.40

◎ Contract 25 + $0.50	◎ Contract 24
◎ Contract 25 + $0.15	◎ Contract 24
◎ Contract 25 + $0.10	◎ Contract 24
◎ Contract 25 + $0.05	◎ Contract 24
◎ Contract 25 + $0.01	◎ Contract 24
◎ Contract 25	◎ Contract 24
◎ Contract 25	◎ Contract 24 + $0.01
◎ Contract 25	◎ Contract 24 + $0.05
◎ Contract 25	◎ Contract 24 + $0.10
◎ Contract 25	◎ Contract 24 + $0.15
◎ Contract 25	◎ Contract 24 + $0.50

- Three questions: H vs L, H vs F, L vs F

- Can identify five types of subject
- Preference for flex
  - $F \succ L$ and $F \succ H$
- Standard
  - $F \sim L \succ H$ or $F \sim H \succ L$
- Indifferent
  - $F \sim L \sim H$
- Commitment
  - $L \succ F$ or $H \succ F$
- Intransitive

Type	N	Percent	Benchmark I	p-value	Benchmark II	p-value
Flexibility	43	35%	17%	0.00	6%	0.00
Standard	40	32%	17%	0.00	6%	0.00
Indifferent	23	19%	25%	0.12	13%	0.06
Commitment	7	6%	42%	0.00	16%	0.00
Intransitive	11	9%	-	-	59%	0.00

- Benchmark 1: Uniform random choice over transitive preference profiles
- Benchmark 2: Randomizing between preferences at each choice

- Typical time preference experiment [e.g Benhabib Bisin Schotter 2007]:
    - Identify x that is indifferent to y in 1 month's time
    - Identify z in 1 month's time that is indifferent to w in 2 month's time
- Approximate the discount rates as

$$\delta(0,1) = \frac{x}{y}$$
$$\delta(1,2) = \frac{z}{w}$$

- Evidence of present bias if

$$\frac{x}{y} < \frac{z}{w}$$

- Example: Dean and Ortoleva [2013]
- Indifferent between $9.28 in 5 weeks and $10 in 7 weeks
  - Implies discount rate of about 0.93
- Indifferent between $8.94 today and $10 in 2 weeks
  - Implies discount rate of about 0.89
- But there are problems with this approach
  - Trust/transaction costs
  - Money$\neq$Utility
  - Arbitrage

	week 1		week 2		week 3	
	A	B	A	B	A	B
avg. switch at or below (CFA)	157.0	155.6	153.5	152.4	158.4	154.6
correlation A	weeks 1 and 2: 0.61			weeks 2 and 3: 0.67		
correlation B	weeks 1 and 2: 0.62			weeks 2 and 3: 0.64		
A=B	64.40%		65.39%		69.82%	
more patient in A	18.47%		16.17%		13.32%	
more patient in B	17.13%		18.45%		16.86%	
pay neg. interest	9.66 %	8.15%	7.38%	5.52%	7.37%	6.86%
inconsistent	14.76%	13.93%	10.16%	11.71%	11.13%	10.51%
N	969		965		961	

- Experiment in urban Mali
- Surveyors came to the house every week
- No problem with transaction costs or trust
- No present bias!

- So we can solve the trust/transaction costs problem
- But there are still issues with using money
- Arbitratge:
  - If you can get 5% interest at the local bank, why would you ever accept anything other than 5% in the experiment?
- Shocks
  - If your rent is due today, maybe money is more valuable today than it would be in a week
  - You would look present bias
- In neither case would you be learning about time preferences

- How to solve the problem
- We could use something other than money
    - Primary Rewards: e.g. "Time Discounting for Primary Rewards" [McClure et al 2007]
    - Effort: e.g "Working Over Time: Dynamic Inconsistency in Real Effort Tasks" [Augenblick et al 2015]
- Does this solve the problem?
- Depends on whether people
    - Suffer shocks to the cost of effort
    - Can 'smooth' effort

- Augenblick et al [2015]
- Discounting in a real effort experiment
- Have to complete a number of tasks in order to earn $100
  - Greek translations
  - Tetris games (!)
- Can decide how to trade off tasks
  - Today vs next week
  - Next week vs week after
  - Using 'convex time budgets'

Panel A: Job 1- Greek Transcription

Panel B: Job 2- Partial Tetris Games

	Monetary Discounting		Effort Discounting		
	(1) All Delay Lengths	(2) Three Week Delay Lengths	(3) Job 1 Creek	(4) Job 2 Tetris	(5) Combined
Present Bias Parameter: $\hat{\beta}$	0.974 (0.009)	0.988 (0.009)	0.900 (0.037)	0.877 (0.036)	0.888 (0.033)
Daily Discount Factor: $\hat{\delta}$	0.998 (0.000)	0.997 (0.000)	0.999 (0.004)	1.001 (0.004)	1.000 (0.004)
Monetary Curvature Parameter: $\hat{\alpha}$	0.975 (0.006)	0.976 (0.005)			
Cost of Effort Parameter: $\hat{\gamma}$			1.624 (0.114)	1.557 (0.099)	1.589 (0.104)
# Observations # Clusters Job Effects	1500 75	1125 75	800 80	800 80	1600 80 Yes
$H_0 : \beta = 1$	$\chi^2(1) = 8.77$ $(p < 0.01)$	$\chi^2(1) = 1.96$ $(p = 0.16)$	$\chi^2(1) = 7.36$ $(p < 0.01)$	$\chi^2(1) = 11.43$ $(p < 0.01)$	$\chi^2(1) = 11.42$ $(p < 0.01)$
$H_0 : \beta(Col.\ 1) = \beta(Col.\ 5)$	$\chi^2(1) = 6.37$ $(p = 0.01)$				
$H_0 : \beta(Col.\ 2) = \beta(Col.\ 5)$		$\chi^2(1) = 8.26$ $(p < 0.01)$			

- Augenblick et al. [2015] find preference reversals in the real effort task
- Does this lead to a preference for commitment?
- Recall:

$$
\begin{aligned}
&\text{Non-exponential discounting} \\
\Leftrightarrow\ &\text{Preference reversals} \\
\Leftrightarrow\ &\text{Demand for commitment}
\end{aligned}
$$

- Subjects offered a commitment device
  - Choice for effort at $t + 1$ vs $t + 2$ made at time t and $t + 1$
  - Commitment: Higher probability that time t choice would be operationalized

Link Between Preference Reversals and Preference for Commitment

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Table 4: Monetary and Real Effort Discounting by Commitment

	Monetary Discounting		Effort Discounting	
	Commit ($=0$)	Commit ($=1$)	Commit ($=0$)	Commit ($=1$)
	(1) Tobit	(2) Tobit	(3) Tobit	(4) Tobit
Present Bias Parameter: $\hat{\beta}$	0.999 (0.010)	0.981 (0.013)	0.965 (0.022)	0.835 (0.055)
Daily Discount Factor: $\hat{\delta}$	0.997 (0.000)	0.997 (0.001)	0.988 (0.005)	1.009 (0.005)
Monetary Curvature Parameter: $\hat{\alpha}$	0.981 (0.009)	0.973 (0.007)		
Cost of Effort Parameter: $\hat{\gamma}$			1.553 (0.165)	1.616 (0.134)
# Observations	420	705	660	940
# Clusters	28	47	33	47
Job Effects	-	-	Yes	Yes
$H_0: \beta = 1$	$\chi_2(1) = 0.01$ ($p = 0.94$)	$\chi_2(1) = 2.15$ ($p = 0.14$)	$\chi_2(1) = 2.64$ ($p = 0.10$)	$\chi_2(1) = 9.00$ ($p < 0.01$)
$H_0: \beta(Col.\ 1) = \beta(Col.\ 2)$	$\chi_2(1) = 1.29$ ($p = 0.26$)			
$H_0: \beta(Col.\ 3) = \beta(Col.\ 4)$			$\chi_2(1) = 4.85$ ($p = 0.03$)	

- Subjects who commit have higher measured present bias
- However, as usual, hard to get people to pay for commitment

- Is the fact that present bias agents won't pay for commitment a sign of a lack of sophistication?
- Maybe present bias is not due to non-exponential discounting
- Do we have other evidence for lack of sophistication?

- "Paying Not to Go to the Gym" [DellaVigna and Malmendier, 2006]
- Test whether people have sophisticated beliefs about their future behavior
- Examine the contract choices of 7978 healthcare members
- Also examine their behavior (i.e. how often they go to the gym)
- Do people overestimate how much they will go the gym, and so choose the wrong contract?

- Three contracts
  - Monthly Contract – automatically renews from month to month
  - Annual Contract – does not automatically renew
  - Pay per usage

- Consumers appear to be overconfident
  - Overestimate future self control in doing costly tasks
    - Going to the gym
    - Cancelling contract
- 80% of customers who buy monthly contracts would be better off had they paid per visit (assuming same number of visits)
  - Average cost of $17 vs $10
- Customers predict 9.5 visits per month relative to 4.5 actual visits
- Customers who choose monthly contracts are 18% more likely to stay beyond a year than those who choose annual contract, and wait 2.29 months after last visit before cancelling

- Naivete can also lead people to take up commitment contracts which are bad for them
    - "When Commitment Fails - Evidence from a Regular Saver Product in the Philippines" [John 2015]
- Subjects offered the chance to take up an "Achiever's Savings Account'"
    - Had to make regular payments
    - If they failed, paid a 'default cost'
    - Interest rate equal to the standard market rate
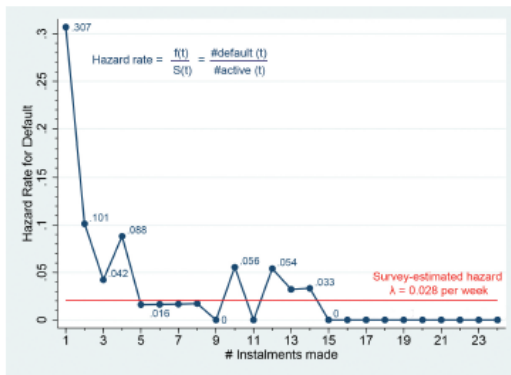
- 55% default on contract
- Largely do so 'immediately': unlikely to be due to shocks

- There are not a lot of naturally occurring commitment devices out there
- But people can be induced to take up commitment
  - Often will not pay for it
- Two possible reasons for this
  - Preference for flexibility
  - Lack of sophistication

  There is evidence for both of these
- Time preference experiments run with money are problematic
- Other tasks may be better
  - Show more present bias
- There is a link between present bias and preference for commitment