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

Preference for Commitment

- 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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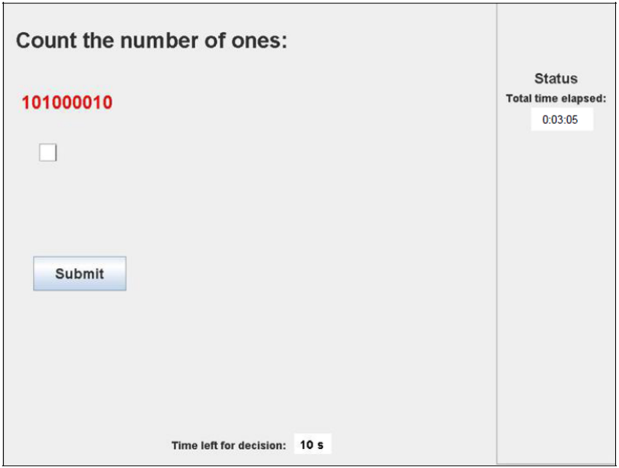
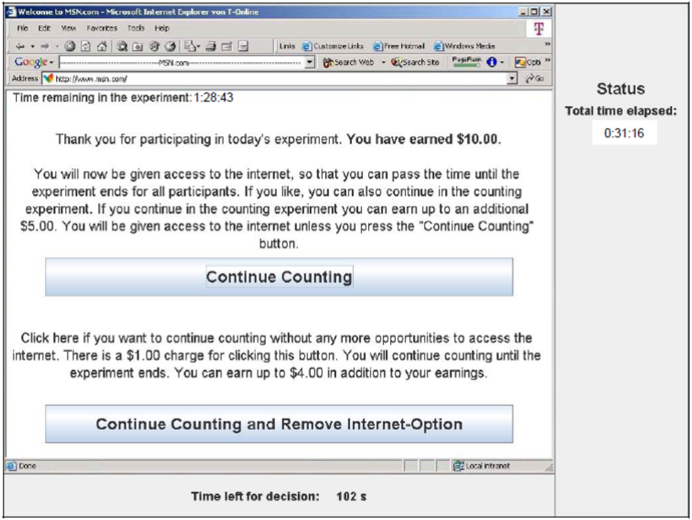
- Basic set up: Counting Task



Temptation and Commitment in the Laboratory

- Basic set up: Counting Task
  - 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

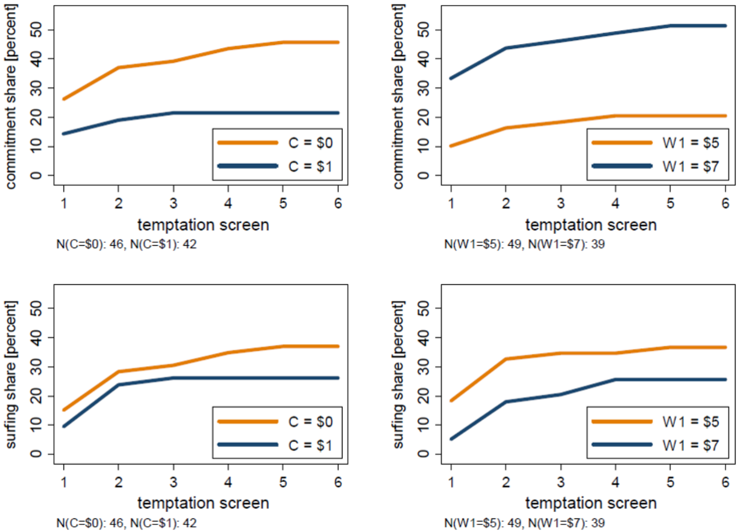
Temptation and Commitment in the Laboratory



Temptation and Commitment in the Laboratory

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



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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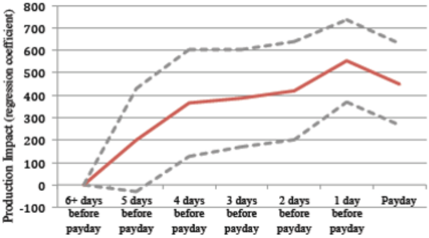
Self Control at Work

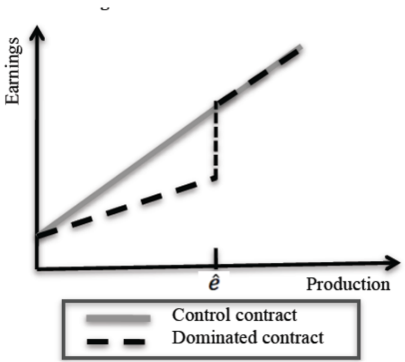
- Consider a job in which you get paid piece rate
  - Paid only at the end of the week
- What is the effect of temptation (e.g. hyperbolic discounting)?
  - Pay day effects: work harder when reward is immediate
  - May work less hard in period t+1 than would like in period t: Creates a demand for commitment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

Self Control at Work

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

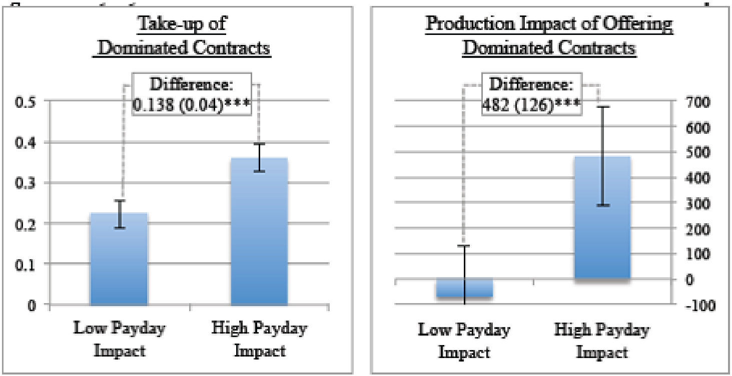
Panel A: Take-up of Dominated Contracts (Summary Statistics)	
Dominated contract chosen: conditional on attendance	0.36 (0.31)
Dominated contract chosen: target=0 if absent	0.28 (0.26)

- 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

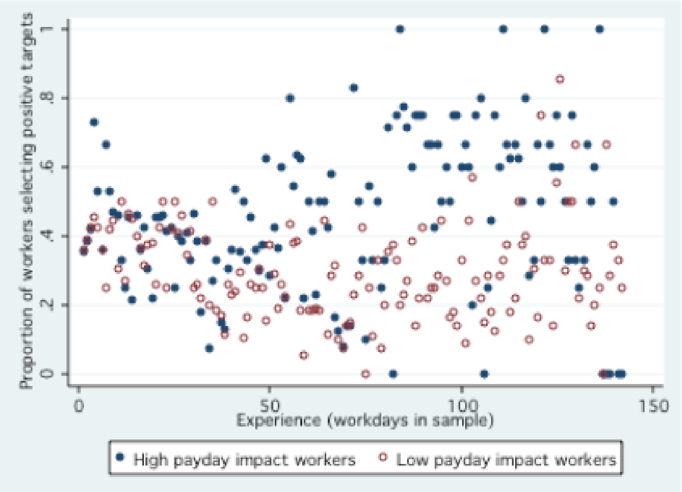
Panel B: Treatment Effects of Contracts

Sample	*Dependent variable: Production* Control & Option Obs (1)	Control & Option Obs (2)	Full Sample (3)	*Dependent var: Attendance* Full Sample (4)
Option to choose dominated contract	120			
	(59)**			
Evening option to choose dominated contract		156	150	0.01
		(69)**	(69)**	(0.01)
Morning option to choose dominated contract		84	73	-0.00
		(69)	(69)	(0.01)
Target imposed: Low target			3	-0.00
			(90)	(0.01)
Target imposed: Medium target			213	-0.01
			(91)**	(0.01)
Target imposed: High target			334	-0.01
			(150)**	(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

Preference for Commitment

- 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)
- Not an exhaustive list
  - e.g. self signalling?

Preference Uncertainty Model

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

Preference Uncertainty Model

- X : set of alternatives
- S : set of states
- $\mu \in \Delta(S)$: probability distribution over states
- $u : X \times S \rightarrow \mathbb{R}$: utility function
  - $u(x, s)$ utility of alternative x in state s
- Preference uncertainty driven by uncertainty about s
- Use this model to think about
  - Choices **between** menus of alternatives
  - Choices **from** those menus
- i.e. do people use the flexibility they desire?

- Let A be a menu of alternatives
- Choice from A will take place **after** the state is known
- Value of A **before** the state is known given by

$$U(A) = \sum_{s \in S} \mu(s) \max_{x \in A} u(x, s)$$

- U represents **choice between menus**

- The same model also makes predictions about choices **from** menus
- $P(y, A)$: Probability of choosing alternative y from menu A

$$P(y, A) = \sum_{s \in S} \mu(s) \mathbf{1}[\mathbf{x} \in \arg\max_{\mathbf{y} \in \mathbf{A}} \mathbf{u}(\mathbf{y}, \mathbf{s})]$$

- Preference uncertainty implies a link between menu preference and stochastic choice
  - See Ahn and Sarver [2013]

Weak Preference for Flexibility For any two menus $A \succeq B$, $A \cup B \succeq A$

- The union of two menus weakly preferred to each individually
- Rules out 'preference for commitment' i.e. $A \cup B \prec A$
  - Observable implication of temptation
- Note: $A \cup B \succ A$ **only if** there is preference uncertainty (i.e. S is not a singleton)
  - If there is no uncertainty, $A \cup B \sim A$
  - Call this strict preference 'Preference for Flexibility'

Implications [Ahn and Sarver 2013]

Consequentialism $A \cup \{x\} \succ A \Rightarrow P(x, A \cup \{x\}) > 0$

- If you would pay for x to be added to the menu A, must sometimes choose x
- If it is never chosen it cannot be increasing the value of the menu

Responsive Menu Preferences $P(x, A \cup \{x\}) > 0 \Rightarrow A \cup \{x\} \succ A$

- If x is sometimes chosen when added to A ,the larger menu must be preferred
- Except in the case of indifference (which we will discuss later)

- 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)

Contracts

- 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 $F = L \cup H$

Choice of Contracts

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

Experimental Structure - Main Experiment

- Instructions, comprehension check
- Example tasks
- Exogenous contracts section
  - Perform tasks under 3 contracts: High, Low, Flex
- Additional instructions
- Contract selection questions
- Endogenous contract section
  - Realization of one selected contract
- Payment

Identifying Menu Preferences and Random Choice

- Menu Preferences
  - Use data from the multiple price list question to construct preferences
  - $A \succ B$ if subject is prepared to pay for menu A over menu B
  - $A \sim B$ if neither $A \succ B$ nor $B \succ A$
- Random choice
  - In order to estimate random choice need multiple observations
  - Not enough data to do so for individual subjects
  - **Group** subjects based on their menu preferences
  - Estimate random choice function for each group using behavior in exogenous contracts

Evidence for Preference for Flexibility

- 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

Evidence for Preference for Flexibility

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

Evidence for Preference for Flexibility

- 85% of subjects can be explained by the model
- 35% can only be explained by the model if there is preference uncertainty
- 15% not explained by the model
- Of which 9% are intransitive
- Very little (6%) evidence of preference for commitment

Evidence for Consequentialism

Subjects who:	Do Low number in Flex	N	p-value
Flex $\nsucc$ *High*	0.09	57	p=0.00
Flex $\succ$ *High*	0.37	67	

Subjects who:	Do High number in Flex	N	p-value
Flex $\nsucc$ *Low*	0.42	53	p=0.00
Flex $\succ$ *Low*	0.77	71	

- Subjects who strictly prefer F to H (L) make use of the additional available option
- Do so at a higher rate than those that do not have such a preference

Evidence for Responsive Menu Preferences

	Menu Preference:	All Subj.	Non-Indiff.
Do Low number in Flex	*Flex* $\succ$ *High*	0.83	0.96
Do High number in Flex	*Flex* $\succ$ *Low*	0.71	0.83

- Most subjects who do low (high) number of acts prefer F to H (L)
- This is near universal in the case of non-indifferent subjects

- 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

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

- Evidence of present bias if

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

- What are some of the problems with this approach?
  - Curvature of the utility function
  - Transaction costs/trust
  - Income smoothing and shocks

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Curvature of the Utility Function

- Assume that money is consumed in the period it is received.
- Background consumption $\bar{c}$ in each period
- Indifference point occurs when

$$\begin{aligned} & u(\bar{c}+x)+\delta(0,1)u(\bar{c})+\sum_{t=2}^{\infty}\delta(0,t)u(\bar{c}) \\ = \quad & u(\bar{c})+\delta(0,1)u(\bar{c}+y)+\sum_{t=2}^{\infty}\delta(0,t)u(\bar{c}) \end{aligned}$$

- Which implies

$$\delta(0,1)=\frac{u(\bar{c}+x)-u(\bar{c})}{u(\bar{c}+y)-u(\bar{c})}$$

- Which equals $\frac{x}{y}$ only if u is locally linear
- Note, will not affect identification of present bias, but will affect identification of discount factor

Curvature of the Utility Function

- Solution #1: "Eliciting Risk and Time Preferences " [Andersen et al 2008]
- (As the name suggests) measure risk and time preferences for each subject
  - MPL to measure indifference point between present and future consumption
  - MPL to measure indifference point between safe and risky prospects
- Use the latter to estimate curvature of the utility function
- Replace $\frac{x}{y}$ with $\frac{u(x)}{u(y)}$
- Reduces estimated annual discount rates from around 25% to around 10%
- Note: assumes same curvature in 'risk' and 'time' preferences

- Solution #2: "Estimating Time Preferences from Convex Budgets " [Andreoni and Sprenger]

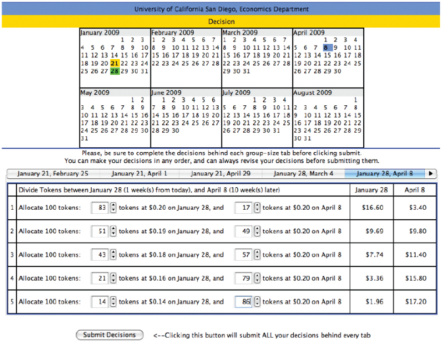


Figure 1. Sample Decision Screen

- Assuming subjects do not pick at the endpoints, can estimate curvature and discount rate

- What are some of the problems with this approach?
  - Curvature of the utility function
  - Transaction costs/trust
  - Income smoothing and shocks

Transaction Costs/Trust

- Imagine that you think that the experimenter is forgetful
- If they give you the money today, they will remember for sure
- If they are supposed to give you the money in the future, there is a γ probability they will forget
- Then indifference point between today and one month (assuming linear utility) if

$$\frac{x}{y} = \gamma\delta(0,1)$$

- And between one month and two months

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

- Even an exponential discounted will look like they have present bias
- Same effect if there are transaction costs to collecting money on any day other than today

Transaction Costs/Trust

- Various authors have made different attempts to solve this problem:
- Andreoni and Sprenger [2013]
  - All payments (current and future) paid to campus mailbox
  - Always payments in all periods
  - Self addressed envelopes
  - Provided with the address of the experimenter
- Halevy [2015]
  - Repeated visits to classroom
- Dean and Sautmann [2015]
  - Repeated survey visits to household
- Generally studies that take these measures find little present bias for money

Transaction Costs/Trust

	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!

- What are some of the problems with this approach?
    - Curvature of the utility function
    - Transaction costs/trust
    - Income smoothing and shocks

Income Smoothing and Shocks

- So far, we have assumed that experimental payments take place in isolation
- But this may be inappropriate
  - Subjects may suffer shocks to income/value of consumption
    - Get paid today
    - Have a big bill due today
  - May smooth consumption by borrowing and saving

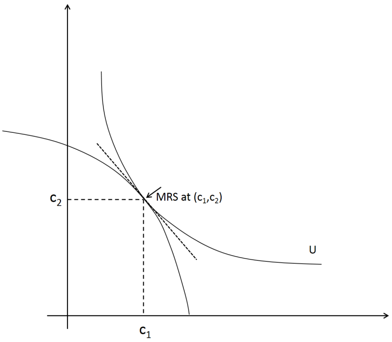
- Recall the Strong Hyperbolic Euler Equation

$$\begin{aligned} \frac{\partial u(c_t)}{\partial c_t} &= R_t E_t \left[\left(\beta\delta c'_{t+1} + (1 - c'_{ct+1})\delta \right) \frac{\partial u(c_{t+1})}{\partial c_{t+1}} \right] \\ &= R_t E_t d_t \frac{\partial u(c_{t+1})}{\partial c_{t+1}} \end{aligned}$$

- It can be shown that, if experimental payments are small

$$\frac{y}{x} = R_t = MRS_t = \frac{\frac{\partial u(c_t)}{\partial c_t}}{E_t \left(d_t \frac{\partial u(c_{t+1})}{\partial c_{t+1}} \right)}$$

- Experimental payments measure MRS not time prefs



- This does **NOT** rely on direct arbitrage of experimental payments
  - Only that experimental subjects obey Euler Equation
  - Take their actual MRS into account when making experimental decisions

$$\frac{y}{x} = R_t = MRS_t = \frac{\frac{\partial u(c_t)}{\partial c_t}}{E_t\left(d_t \frac{\partial u(c_{t+1})}{\partial c_{t+1}}\right)}$$

- What will we see in time preference experiments?
- Depends on the interest rate regime
  - Perfect credit markets with market interest rate $\bar{R}$

$$\frac{y}{x} = R_t = \bar{R}$$

Income Smoothing and Shocks

- No access to credit

$$\frac{y}{x} = \frac{\frac{\partial u(y_t)}{\partial y_t}}{E_t\left(d_t \frac{\partial u(y_{t+1})}{\partial y_{t+1}}\right)}$$

$$\frac{\frac{\partial u(y_t)}{\partial y_t}}{\beta\delta E_t\left(\frac{\partial u(y_{t+1})}{\partial y_{t+1}}\right)}$$

  - No smoothing, but measured MRS affected by shocks
  - 'Present bias' individual could just be having a bad day
  - Will give $\beta\delta$ 'on average'

Income Smoothing and Shocks

- Partial access to credit: $R_t = R(s_t)$
  - Interest rates increase with borrowing (decrease with savings)
- Implies that measured MRS should
  - Fall with exogenous increase in income
  - Rise with an exogenous increase to $\frac{\partial u(c_{t+1})}{\partial c_{t+1}}$ (i.e. expenditure shock such as family illness)
  - Fall with an increase in savings
- Test this using the experiment in Mali

Income Smoothing and Shocks

	OLS	OLS	OLS	OLS	IV	IV	CL
Labor income			-0.185	-0.189	-0.153	-0.159	-0.262 +
			(0.142)	(0.143)	(0.163)	(0.142)	(0.136)
Nonlabor income "endogenous"			-0.330	-0.321	-0.268	-0.265	-0.316
			(0.251)	(0.258)	(0.261)	(0.270)	(0.282)
Nonlabor income "exogenous"	**-0.409 ****	**-0.409 ****	**-0.382 ****	**-0.384 ****	**-0.378 ***	**-0.380 ***	**-0.379 ***
	(0.142)	**(0.149)**	**(0.125)**	**(0.133)**	**(0.171)**	**(0.149)**	**(0.171)**
Other spending			0.268 *	0.245 +	0.192	0.177	0.215 +
			(0.128)	(0.131)	(0.141)	(0.132)	(0.119)
Adv. event expense	**0.252 +**	**0.233 +**	**0.251**	**0.222**	**1.683 +**	**1.562 ***	**0.390 ***
	(0.145)	**(0.139)**	**(0.182)**	**(0.183)**	**(0.761)**	**(0.769)**	**(0.199)**
1/(error SD)	-	-	-	-	-	-	0.916 **
							(0.044)
Constant	4.69 **	4.782 **	4.56 **	4.67 **	4.527 **	4.622 **	-
	(0.011)	(0.059)	(0.093)	(0.125)	(0.144)	(0.145)	
Ind FE	yes	yes	yes	yes	yes	yes	yes
Time FE		yes		yes		yes	yes
Observations	2540	2540	2390	2390	2390	2390	12608

*Standard errors clustered at the individual level (in parentheses). Significance levels + p<0.10, * p<0.05, ** p<0.01*

Table 8: Savings and MRS_t.

	OLS	OLS	CL
Savings (I-E)	-0.291 **	-0.279 **	-0.291 **
	(0.076)	(0.079)	(0.080)
1/(error SD)	-	-	0.916 **
			0.044
Constant	4.584 **	4.673 **	-
	(0.029)	(0.070)	
Ind FE	yes	yes	yes
Time FE		yes	yes
Observations	2390	2390	12608

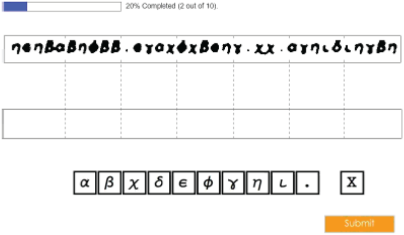
Standard errors clustered at the individual level (in parentheses).
*Significance levels + p<0.10, * p<0.05, ** p<0.01*

- So what can we learn from time preference experiments?
- If people are not 'narrow bracketers' then not a lot about time preferences
  - Measured MRS reports effective market interest rate
  - Income and expenditure shocks can look like present bias
  - In complete credit constraints case, average of repeated measures can be used to estimate parameters
- However, we can potentially learn about the shocks and constrains on a household finances
  - Less credit constrained $\Rightarrow$ less volatile MRS
  - Positive correlation between spending and MRS $\Rightarrow$ importance of expenditure shocks

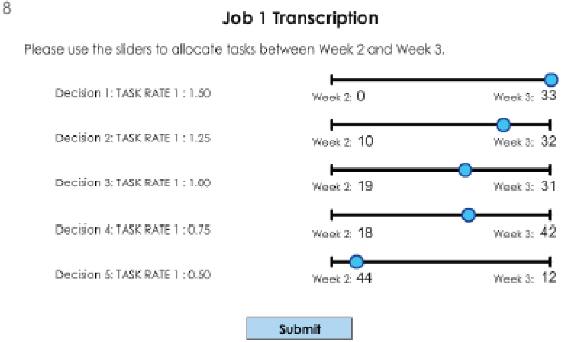
Measuring Time Preferences

- Given these problems, how can we measure time preferences?
- 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 or not people suffer shocks to the cost of effort
    - Can 'smooth' effort

Panel A: Job 1- Greek Transcription



Panel B: Job 2- Partial Tetris Games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Job 1 Transcription
Please use the sliders to allocate tasks between Week 2 and Week 3.
Decision 1: TASK RATE 1 : 1.50
Week 2: 0
Week 3: 33
Decision 2: TASK RATE 1 : 1.25
Week 2: 10
Week 3: 32
Decision 3: TASK RATE 1 : 1.00
Week 2: 19
Week 3: 31
Decision 4: TASK RATE 1 : 0.75
Week 2: 18
Week 3: 42
Decision 5: TASK RATE 1 : 0.50
Week 2: 44
Week 3: 12
Submit

	Monetary Discounting		Effort Discounting		
	(1) All Delay Lengths	(2) Three Week Delay Lengths	(3) Job 1 Greek	(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	1500	1125	800	800	1600
# Clusters	75	75	80	80	80
Job Effects					Yes
$H_0 : \beta = 1$	$\chi^2(1) = 8.77$ ($p < 0.01$)	$\chi^2(1) = 1.96$ ($p = 0.16$)	$\chi^2(1) = 7.36$ ($p < 0.01$)	$\chi^2(1) = 11.43$ ($p < 0.01$)	$\chi^2(1) = 11.42$ ($p < 0.01$)
$H_0 : \beta(Col.\ 1) = \beta(Col.\ 5)$	$\chi^2(1) = 6.37$ ($p = 0.01$)				
$H_0 : \beta(Col.\ 2) = \beta(Col.\ 5)$		$\chi^2(1) = 8.26$ ($p < 0.01$)			

Link Between Preference Reversals and Preference for Commitment

- 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

-

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
$H_0: \beta = 1$	$\chi_2(1) = 0.01$ $(p = 0.94)$	$\chi_2(1) = 2.15$ $(p = 0.14)$	$\chi_2(1) = 2.64$ $(p = 0.10)$	$\chi_2(1) = 9.00$ $(p < 0.01)$
$H_0: \beta(Col.\ 1) = \beta(Col.\ 2)$	$\chi_2(1) = 1.29$ $(p = 0.26)$			
$H_0: \beta(Col.\ 3) = \beta(Col.\ 4)$			$\chi_2(1) = 4.85$ $(p = 0.03)$	

Sophistication

- 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?
- Not really
  - Technically: violation of sophistication is paying to add an option which you then do not use
  - Intuitively: Maybe present bias is not due to non-exponential discounting
- Do we have other evidence for lack of sophistication?

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

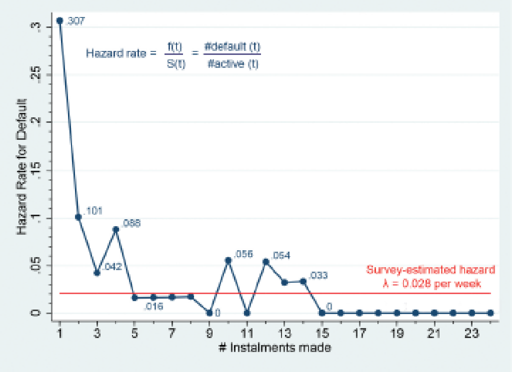
Sophistication

- 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

Sophistication

- 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

Sophistication



- 55% default on contract
- Largely do so ‘immediately’: unlikely to be due to shocks

Summary

- 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