Alcohol and Self-Control
A Field Experiment in India

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Alcohol consumption among the poor

- Heavy drinking is common among low-income males in developing countries.
- Harmful use of alcohol is a recognized global health issue.
- Limited understanding of the economic aspects of alcohol
(1) What is the *economic* impact of heavy drinking?
   - Labor supply, earnings, and productivity
   - Decision-making
   - Is alcohol a cause of poverty?

(2) Why are individuals drinking heavily?
   - Does poverty cause demand for alcohol?
   - Do individuals want to change their drinking patterns?

(3) Alcohol policy
   - Much-debated topic in developing countries
   - Wide range of policy options across Indian states
(1) What is the *economic* impact of heavy drinking?
- Labor supply, earnings, and productivity
- Decision-making: savings behavior
- Is alcohol a cause of poverty?

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- Does poverty cause demand for alcohol?
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- Wide range of policy options across Indian states
Heavily concentrated alcohol consumption in India

Alcohol consumption in India
Per capita (age 15+)

Heavily concentrated alcohol consumption in India

Alcohol consumption in India

- Heavily concentrated alcohol consumption (WHO 2014)
  - Only about a quarter of Indian men drink alcohol at all.
  - Drinkers consume about five standard drinks per day.
- Higher prevalence of drinking among the poor
Alcohol consumption in India

- Heavily concentrated alcohol consumption (WHO 2014)
  - Only about a quarter of Indian men drink alcohol at all.
  - Drinkers consume about five standard drinks per day.
- Higher prevalence of drinking among the poor
- Surveys with 10 low-income professions in Chennai (N=1,227)
  - Over 70% report drinking on previous day.
  - Drinkers drink over 5 drinks per day on average.
  - Over 20% of reported labor incomes spent on alcohol
  - Daytime drinking during regular work hours is common.
Daytime drinking among cycle-rickshaw peddlers

Breathalyzer scores during work hours (11 am to 5 pm)

Blood–alcohol content (BAC)

Cumulative Probability

US legal driving limit
Main related literatures

- **Alcohol and time preferences**
  - Alcohol myopia: Steele & Joseph 1990; Giancola et al. 2010
  - Addictive substances and discounting: MacKillop et al. 2011
  - Endogeneity of time preferences: Becker & Mulligan 1997; Carvalho et al. 2014

- **Self-control, commitment, and savings**
  - Demand for commitment: Ariely & Wertenbroch 2002; Giné et al. 2010; Kaur et al. 2015; Augenblick et al. 2015
  - Commitment savings: Ashraf et al. 2006; Dupas & Robinson 2013; Karlan et al. 2014
  - Naïveté vs. sophistication: DellaVigna & Malmendier 2004; Ali 2011

- **‘Rational’ addiction and ‘sin’ taxation**
  - ‘Rational’ addiction: Becker & Murphy 1988; Gruber & Kőszegi 2001
  - ‘Sin’ taxation: Gruber & Kőszegi 2004; O'Donoghue & Rabin 2006

- **Incentives for health-related behavior**
  - Contingency management: Petry et al. 2000; Volpp et al. 2008
Study sample

• Cycle-rickshaw peddlers in Chennai (N=229)
  • 35 years old, 5 years of education
  • 80% are married, 2 children
  • Daily labor incomes of about Rs. 300 ($5)

• Alcohol consumption
  • Individuals drink (almost) every day, usually alone.
  • Over 5 standard drinks of hard liquor (>80 proof) per day
  • A third of labor incomes spent on alcohol
  • High levels of intoxication, often during the day
  • 80% say they would be better off if all liquor stores closed.
Experimental design: common elements

- Individuals paid to visit study office for 20 days
- Daily visits any time between 6 pm and 10 pm
- Measure blood-alcohol content (BAC) using breathalyzer test
- Short survey
  - Labor market outcomes
  - Alcohol consumption
  - Expenditure patterns
- Opportunity to save money at study office
Financial incentives for sobriety: treatment groups

(I) **Control Group:** unconditional payments
   - Paid Rs. 90 regardless of BAC

(II) **Incentive Group:** monetary incentives to show up sober
   - Paid Rs. 60 if BAC > 0
   - Paid Rs. 120 if BAC = 0
Financial incentives for sobriety: treatment groups

(I) Control Group: unconditional payments
   • Paid Rs. 90 regardless of BAC

(II) Incentive Group: monetary incentives to show up sober
   • Paid Rs. 60 if BAC > 0
   • Paid Rs. 120 if BAC = 0

(III) Choice Group: incentives vs. unconditional payments
   • About 60 percent of individuals choose incentives.
Experimental design: timeline
Experimental design: timeline

Screening
Consent
Baseline

Day 1  Day 4  Day 7  Day 13  Day 20

Control
Experimental design: timeline

- Day 1:
  - Screening
  - Consent
  - Baseline

- Day 4:
  - Incentives assigned

- Day 7:
  - Incentives

- Day 13:
  - Control
    - (2/3)

- Day 20:
  - Control
    - (1/3)
Experimental design: timeline

Day 1
- Screening
- Consent
- Baseline

Day 4
- Incentives assigned

Day 7

Day 13

Day 20

Incentives
(2/3)

Control

Incentives
(1/3)

Control
(1/3)

Incentives
(1/3)

Control
Experimental design: timeline

- **Screening**
  - Consent
  - Baseline

- **Incentives assigned**

- **Choice 1**

- **Control**
  - (2/3)
  - (1/3)

- **Control**
  - (1/3)

- **Choice**
  - (1/3)

- **Incentives**
  - (1/3)

- Day 1
- Day 4
- Day 7
- Day 13
- Day 20
Experimental design: timeline

- **Day 1**: Screening
  - Consent
  - Baseline

- **Day 4**: Incentives assigned

- **Day 7**: Choice 1

- **Day 13**: Choice 2

- **Day 20**: Control

Incentives assigned: (2/3) Control

Choice 1: (1/3) Control

Choice 2: (1/3) Control

Incentives assigned: (1/3) Choice
Experimental design: timeline

Screening → Consent → Baseline → Day 1

Incentives assigned → Choice 1 → Day 4

Choice 1 → Day 7

Choice 2 → Day 13

Choice 3 → Day 20

Control (2/3) → Incentives (1/3) → Choice (1/3)

Choice (1/3) → Control (1/3)

Control (1/3) → Choice

Choice → Control
Incentives significantly decreased daytime drinking...
...but overall drinking did not fall by much.
Financial incentives significantly reduced daytime drinking.

- Sobriety at study office increased by 33 percent (13 ppt).
- Very similar drinking patterns in Incentive and Choice Groups.
- Effects are not due to differences in attendance.

Incentives caused only moderate reduction in overall drinking.

- 6 to 10 percent decrease in overall alcohol consumption

No long-run effects of short-run incentives

- Contrast to existing literature
No significant labor market effects of increased sobriety

• Does alcohol affect earnings?
  • Long literature at least since Irving Fisher (1926, 1928)
  • Many studies, not much identification (Cook & Moore 2000)
  • Little evidence from developing countries

• No significant effects on labor market outcomes in my study
  • Does not imply that alcohol has no labor market effects
  • First-stage estimates are significant, but not large.
  • Earnings are imprecisely measured.
  • Longer-run effects might be quite different (e.g. reputation).
  • Alcohol may help with physical pain at work.
Measuring the impact of increased sobriety on savings

- All subjects got personalized savings box at study office.
  - Could save up to Rs. 200 per day
  - Paid out entire amount plus matching contribution on day 20
- Cross-randomized matching contribution to benchmark effects
  - 10% vs. 20% of amount saved
- Cross-randomized commitment savings feature
  - Allowed to withdraw any day between 6 pm and 10 pm vs. not allowed to withdraw until day 20
  - Commitment savings is imposed, no elicitation of demand for it
Incentives for sobriety increased savings.

Cumulative Savings by Treatment Group

- Alcohol treatment assigned

| DEPOSITS | WITHDRAWALS |
• Accounting exercise suggests increasing sobriety increased savings beyond mechanical effects.

• Commitment savings devices are *designed* to help overcome time inconsistency and self-control problems in saving.

• If alcohol affects savings by increasing myopia, then it should also affect time inconsistency and self-control.

• Increasing sobriety should *lower* the effect of commitment savings, and vice versa.
Interaction between sobriety and commitment savings

Effect of Commitment Savings without Sobriety Incentives

- No alcohol treatment, commitment savings
- No alcohol treatment, no commitment savings

Day in Study vs. Cumulative savings (Rs)
Interaction between sobriety and commitment savings

Effect of Commitment Savings with Sobriety Incentives

- Pooled alcohol treatment, no commitment savings
- Pooled alcohol treatment, commitment savings
Interaction between sobriety and commitment savings

Sobriety Incentives vs. Commitment Savings

- Pooled alcohol treatment, commitment savings
- Pooled alcohol treatment, no commitment savings
- No alcohol treatment, commitment savings
- No alcohol treatment, no commitment savings

Day in Study

Cumulative savings (Rs)
• No evidence of effects of sobriety on labor market outcomes.
• Increasing sobriety significantly raised savings.
• Sobriety and commitment savings are substitutes in their effects on savings.
• Alcohol affects savings via changes in myopia.
• Limited role of changes in sophistication.
Eliciting willingness to pay for incentives

- Choice Group chooses between:
  - Incentives for sobriety
  - Unconditional payments

- Choice sessions on days 7, 13, 20, each for subsequent week
  - Elicit preferences for set of 3 choices
  - Then randomly select one choice to be implemented (RLIS)
Demand for incentives

- **Option A:** incentives for sobriety
  - Same payment structure as Incentive Group
  - Rs. 60 if BAC > 0, Rs. 120 if BAC = 0

- **Option B:** payment regardless of BAC

<table>
<thead>
<tr>
<th>BAC &gt; 0</th>
<th>BAC = 0</th>
<th>Option B</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Rs. 60</td>
<td>Rs. 120</td>
<td>Rs. 90</td>
</tr>
<tr>
<td>(2) Rs. 60</td>
<td>Rs. 120</td>
<td>Rs. 120</td>
</tr>
<tr>
<td>(3) Rs. 60</td>
<td>Rs. 120</td>
<td>Rs. 150</td>
</tr>
</tbody>
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Demand for incentives

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<tbody>
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<td>BAC $= 0$</td>
</tr>
<tr>
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<td>Rs. 120</td>
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<table>
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<tr>
<th>BAC &gt; 0</th>
<th>BAC = 0</th>
<th>regardless of BAC</th>
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<tbody>
<tr>
<td></td>
<td>Option A</td>
<td>Option B</td>
</tr>
<tr>
<td>(1)</td>
<td>Rs. 60</td>
<td>Rs. 90</td>
</tr>
<tr>
<td>(2)</td>
<td>Rs. 60</td>
<td>Rs. 120</td>
</tr>
<tr>
<td>(3)</td>
<td>Rs. 60</td>
<td>Rs. 150</td>
</tr>
<tr>
<td></td>
<td>Rs. 120</td>
<td>Rs. 120</td>
</tr>
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</table>
### Choice group: incentive compatibility

<table>
<thead>
<tr>
<th>Choice</th>
<th>Option A</th>
<th>Option B</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>BAC &gt; 0</td>
<td>BAC = 0</td>
</tr>
<tr>
<td>(1)</td>
<td>Rs. 60</td>
<td>Rs. 120</td>
</tr>
<tr>
<td>(2)</td>
<td>Rs. 60</td>
<td>Rs. 120</td>
</tr>
<tr>
<td>(3)</td>
<td>Rs. 60</td>
<td>Rs. 120</td>
</tr>
</tbody>
</table>

- Elicit preferences for all three choices
- Choice 1 implemented with high probability (90%)
- Order of choice randomized (ascending or descending)
High demand for commitment

Fraction choosing incentives on Day 7

- Choice 1: unconditional payment = Rs 90
- Choice 2: unconditional payment = Rs 120
- Choice 3: unconditional payment = Rs 150

Fraction among Choice Group

Fraction choosing incentives on Day 7

- Choice 1: unconditional payment = Rs 90
- Choice 2: unconditional payment = Rs 120
- Choice 3: unconditional payment = Rs 150

28 / 35
Demand for commitment persists over time.

Demand for Incentives over Time

- **Choice 1**: unconditional payment = Rs 90
- **Choice 2**: unconditional payment = Rs 120
- **Choice 3**: unconditional payment = Rs 150

<table>
<thead>
<tr>
<th>Week</th>
<th>Choice 1</th>
<th>Choice 2</th>
<th>Choice 3</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>0.6</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>2</td>
<td>0.6</td>
<td>0.5</td>
<td>0.3</td>
</tr>
<tr>
<td>3</td>
<td>0.6</td>
<td>0.5</td>
<td>0.3</td>
</tr>
</tbody>
</table>
Do individuals want to change their drinking patterns?

- Do individuals sacrifice money for incentives for sobriety?
  - Half of study participants exhibit demand for commitment.
  - A third is willing to sacrifice 10 percent of daily income.
  - Demand for incentives persists over time.
- Relating the demand for incentives to drinking patterns
Do individuals want to change their drinking patterns?

- Do individuals sacrifice money for incentives for sobriety?
  - Half of study participants exhibit demand for commitment.
  - A third is willing to sacrifice 10 percent of daily income.
  - Demand for incentives persists over time.

- Relating the demand for incentives to drinking patterns
  - Individuals with lower BAC are more likely to choose incentives.
  - Demand for incentives is higher for individuals who expect to be more sober under incentives.
  - Demand for commitment is higher if incentives raised sobriety.
## Relationship between demand for incentives and drinking

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Rs 90</th>
<th>(2) Rs 90</th>
<th>(3) Rs 90</th>
<th>(4) Rs 150</th>
<th>(5) Rs 150</th>
<th>(6) Rs 150</th>
</tr>
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<tbody>
<tr>
<td>Week 2</td>
<td>0.01</td>
<td>0.04</td>
<td>0.01</td>
<td>0.02</td>
<td>0.03</td>
<td>0.01</td>
</tr>
<tr>
<td></td>
<td>(0.060)</td>
<td>(0.060)</td>
<td>(0.063)</td>
<td>(0.067)</td>
<td>(0.068)</td>
<td>(0.068)</td>
</tr>
<tr>
<td>Week 3</td>
<td>0.01</td>
<td>-0.01</td>
<td>-0.04</td>
<td>0.12</td>
<td>0.11</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>(0.082)</td>
<td>(0.081)</td>
<td>(0.075)</td>
<td>(0.081)</td>
<td>(0.081)</td>
<td>(0.079)</td>
</tr>
<tr>
<td>BAC during choice</td>
<td>-1.63***</td>
<td></td>
<td>-0.67**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.318)</td>
<td></td>
<td>(0.279)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Days sober in Phase 1</td>
<td>0.06</td>
<td></td>
<td></td>
<td>-0.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.043)</td>
<td></td>
<td></td>
<td>(0.049)</td>
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<tr>
<td>Days sober in Phase 2</td>
<td>0.09**</td>
<td></td>
<td></td>
<td>0.07</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>(0.042)</td>
<td></td>
<td></td>
<td>(0.045)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Incentives increased sobriety</td>
<td>0.04</td>
<td></td>
<td></td>
<td>0.15**</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.065)</td>
<td></td>
<td></td>
<td>(0.071)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp frac sober under incentives</td>
<td>0.56***</td>
<td></td>
<td>0.22**</td>
<td>0.37***</td>
<td>0.27***</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>(0.083)</td>
<td></td>
<td>(0.085)</td>
<td>(0.062)</td>
<td>(0.079)</td>
<td>(0.077)</td>
</tr>
<tr>
<td>Constant</td>
<td>0.76***</td>
<td>0.40***</td>
<td>0.22**</td>
<td>0.37***</td>
<td>0.27***</td>
<td>0.12</td>
</tr>
<tr>
<td></td>
<td>(0.057)</td>
<td>(0.080)</td>
<td>(0.085)</td>
<td>(0.062)</td>
<td>(0.079)</td>
<td>(0.077)</td>
</tr>
<tr>
<td>Observations</td>
<td>211</td>
<td>211</td>
<td>211</td>
<td>211</td>
<td>211</td>
<td>211</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.122</td>
<td>0.147</td>
<td>0.205</td>
<td>0.028</td>
<td>0.024</td>
<td>0.062</td>
</tr>
</tbody>
</table>

Standard errors in parentheses, clustered by individual. Regressions control for order of choices.
How well do individuals understand their drinking patterns?

- Fairly accurate forecasts of own daytime sobriety (on average)
- Very similar ITT estimates for Incentive and Choice Groups
  - IV (= LATE for those who take up the incentive voluntarily) is larger than ATE on the population.
  - Suggests compliers are those who have larger impacts.
How well do individuals understand their drinking patterns?

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- Very similar ITT estimates for Incentive and Choice Groups
  - IV (= LATE for those who take up the incentive voluntarily) is larger than ATE on the population.
  - Suggests compliers are those who have larger impacts.
- Exposure to incentives increases the demand for incentives.
  - Evidence of learning?
How well do individuals understand their drinking patterns?
Exposure to incentives increases demand for incentives.

**Demand for Incentive across Treatment Groups**

- **Choice 1 (Rs 90)**
- **Choice 2 (Rs 120)**
- **Choice 3 (Rs 150)**

**Legend:**
- Incentive Group
- Choice Group
- Control Group
• Heavy drinking is common among low-income males in developing countries.
• Reducing daytime drinking significantly increased savings beyond mechanical effects.
• Alcohol may interfere with cognitive processes in ways that reinforce poverty.
• Individuals understand their drinking fairly well and exhibit high demand for sobriety.
• Double dividend of commitment devices to reduce drinking
Why choose incentives if overall drinking stays constant?

- High demand for incentives, but small changes in behavior?
  - Substantial willingness to pay for incentives
  - Yet overall drinking doesn’t fall by much.
Why choose incentives if overall drinking stays constant?

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  - Substantial willingness to pay for incentives
  - Yet overall drinking doesn’t fall by much.

- Explanations
  1. Several small benefits of incentives
     - Increased earnings
     - Decreased alcohol expenditures
     - Increased savings
     - Value of daytime sobriety
Why choose incentives if overall drinking stays constant?

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  - Substantial willingness to pay for incentives
  - Yet overall drinking doesn’t fall by much.

- Explanations
  1. Several small benefits of incentives
     - Increased earnings
     - Decreased alcohol expenditures
     - Increased savings
     - Value of daytime sobriety
  2. Partial naïveté?
     - Naïveté can lower demand for commitment (Laibson 2015).
     - But people may also overestimate usefulness of commitment.
(1) What is the economic impact of heavy drinking?
   - Larger/more powerful intervention to study labor market effects
   - Other aspects and timing of decision-making
   - Impact on families
   - Is alcohol a cause of poverty?

(2) Why are individuals drinking heavily?
   - Self-control problems matter greatly.
   - What is the role of physical pain?
   - Does poverty cause demand for alcohol?

(3) Alcohol policy: Kerala’s planned introduction of prohibition
   - Opportunity to evaluate concrete policy
   - Large-scale, long-term natural experiment
Demographic and geographic concentration of drinking

- **Demographic concentration**
  - Higher prevalence among lowest wealth and education quintiles
    - NFHS-2: Subramanian et al. 2005
    - NSS: Neufeld et al. 2005
  - Prevalence data from NFHS-3
    - 40.7% vs. 26.5% among lowest vs. highest wealth quintile
    - 42.8% vs. 24.8% among no education vs. 12+ years of education

- **Geographic concentration**
  - Higher prevalence in East, North East, and South
Prevalence of drinking among low-income workers

Fraction Reporting Drinking Alcohol on Previous Day

- Porters
- Construction workers
- Autorickshaw drivers
- Loadmen
- Shopkeepers
- Fishermen
- Fruit/vegetable vendors
- Rickshaw peddlers
- Rag pickers
- Sewage workers

[Graph showing the prevalence of drinking among different low-income workers]
High quantities of alcohol consumed

Number of Standard Drinks Consumed on Previous Day (Conditional on Drinking)
Existing work on alcohol and discounting

- Alcohol myopia: Steele & Joseph 1990; Giancola et al. 2010
  - Existing work focuses on aggression and violence.
- Cross-sectional studies: MacKillop et al. 2011
  - Impulsive “delayed reward discounting” (DRD) correlated with consumption of addictive goods
  - Impulsive DRD tends to precede addiction.
- Experimental studies
  - Experimentally induced intoxication lowers inhibition control in computer lab tasks (Perry & Carroll 2008).
  - No effect on DRD (Richards et al. 1999; Ortner et al. 2003)
- Existing work vs. this study
  - Existing experiments: one-day, low-stake, with students
  - This study: three-week, high-stake experiment with low-income, heavy-drinking sample
### Selection process: Who participates in the study?

<table>
<thead>
<tr>
<th>STAGE</th>
<th>FRACTION</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Eligible in Field Screening</strong></td>
<td>64%</td>
</tr>
<tr>
<td>Not willing to conduct survey</td>
<td>14%</td>
</tr>
<tr>
<td>Drinks too little to be eligible</td>
<td>11%</td>
</tr>
<tr>
<td>Drinks too much to be eligible</td>
<td>1%</td>
</tr>
<tr>
<td>Ineligible for other reasons</td>
<td>3%</td>
</tr>
<tr>
<td>Eligible, but not interested</td>
<td>7%</td>
</tr>
<tr>
<td><strong>Eligible in Office Screening</strong></td>
<td>83%</td>
</tr>
<tr>
<td>Ineligible for medical reasons</td>
<td>13%</td>
</tr>
<tr>
<td>Ineligible for other reasons</td>
<td>4%</td>
</tr>
<tr>
<td><strong>Passed Lead-in Period</strong></td>
<td>66%</td>
</tr>
<tr>
<td>Didn’t pass and BAC = 0 on day 1</td>
<td>19%</td>
</tr>
<tr>
<td>Didn’t pass and BAC &gt; 0 on day 1</td>
<td>15%</td>
</tr>
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## Baseline balance: demographics

<table>
<thead>
<tr>
<th></th>
<th>Treatment groups</th>
<th>p value for test of:</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Control (1)</td>
<td>Incentives (2)</td>
</tr>
<tr>
<td>Age</td>
<td>36.54 (9.96)</td>
<td>35.27 (9.92)</td>
</tr>
<tr>
<td>Married</td>
<td>0.82 (0.39)</td>
<td>0.80 (0.40)</td>
</tr>
<tr>
<td>Number of children</td>
<td>1.80 (1.19)</td>
<td>1.77 (1.55)</td>
</tr>
<tr>
<td>Lives with wife in Chennai</td>
<td>0.73 (0.44)</td>
<td>0.72 (0.45)</td>
</tr>
<tr>
<td>Wife earned income</td>
<td>0.24 (0.43)</td>
<td>0.17 (0.38)</td>
</tr>
<tr>
<td>Years of education</td>
<td>4.89 (3.93)</td>
<td>5.45 (3.95)</td>
</tr>
<tr>
<td>Able to read the newspaper</td>
<td>0.63 (0.49)</td>
<td>0.62 (0.49)</td>
</tr>
<tr>
<td>Added 7 plus 9 correctly</td>
<td>0.86 (0.35)</td>
<td>0.77 (0.42)</td>
</tr>
<tr>
<td>Multiplied 5 times 7 correctly</td>
<td>0.48 (0.50)</td>
<td>0.41 (0.50)</td>
</tr>
<tr>
<td>Distance of home from office (km)</td>
<td>2.64 (2.15)</td>
<td>2.30 (1.06)</td>
</tr>
<tr>
<td>Years lived in Chennai</td>
<td>31.57 (12.19)</td>
<td>27.77 (11.10)</td>
</tr>
<tr>
<td>Reports having ration card</td>
<td>0.65 (0.48)</td>
<td>0.52 (0.50)</td>
</tr>
<tr>
<td>Has electricity</td>
<td>0.81 (0.40)</td>
<td>0.68 (0.47)</td>
</tr>
<tr>
<td>Owns TV</td>
<td>0.76 (0.43)</td>
<td>0.59 (0.50)</td>
</tr>
</tbody>
</table>
## Baseline balance: work and savings

<table>
<thead>
<tr>
<th></th>
<th>Treatment groups</th>
<th>p value for test of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Control (1)</td>
<td>Incentives (2)</td>
</tr>
<tr>
<td>Years worked as a rickshaw puller</td>
<td>14.06</td>
<td>12.49</td>
</tr>
<tr>
<td># of days worked last week</td>
<td>5.41</td>
<td>5.18</td>
</tr>
<tr>
<td>Has regular employment arrangement</td>
<td>0.47</td>
<td>0.52</td>
</tr>
<tr>
<td>Owns rickshaw</td>
<td>0.17</td>
<td>0.25</td>
</tr>
<tr>
<td>Says 'no money' reason for not owning rickshaw</td>
<td>0.61</td>
<td>0.65</td>
</tr>
<tr>
<td>Reported labor income in Phase 1 (Rs/day)</td>
<td>291.86</td>
<td>301.08</td>
</tr>
<tr>
<td>Total savings (Rs)</td>
<td>13261</td>
<td>23903</td>
</tr>
<tr>
<td>Total borrowings (Rs)</td>
<td>11711</td>
<td>5648</td>
</tr>
<tr>
<td>Savings at study office in Phase 1 (Rs/day)</td>
<td>40.98</td>
<td>44.67</td>
</tr>
</tbody>
</table>

*Denotes significance at the 0.10 level.

### BACK TO TREATMENT GROUPS
## Baseline balance: alcohol consumption

<table>
<thead>
<tr>
<th>Treatment groups</th>
<th>p value for test of:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1=2</td>
</tr>
<tr>
<td>Control (1)</td>
<td>12.89</td>
</tr>
<tr>
<td>(10.02)</td>
<td>(8.42)</td>
</tr>
<tr>
<td>Incentives (2)</td>
<td>6.72</td>
</tr>
<tr>
<td>(0.80)</td>
<td>(0.76)</td>
</tr>
<tr>
<td>Choice (3)</td>
<td>0.99</td>
</tr>
<tr>
<td>(0.11)</td>
<td>(0.00)</td>
</tr>
<tr>
<td>Years drinking alcohol</td>
<td></td>
</tr>
<tr>
<td>Number of drinking days per week</td>
<td></td>
</tr>
<tr>
<td>Drinks usually hard liquor (≥ 40 % alcohol)</td>
<td></td>
</tr>
<tr>
<td>Alcohol expenditures in Phase 1 (Rs/day)</td>
<td></td>
</tr>
<tr>
<td># of standard drinks per day in Phase 1</td>
<td></td>
</tr>
<tr>
<td># of std drinks during day in Phase 1</td>
<td></td>
</tr>
<tr>
<td>Baseline fraction sober</td>
<td></td>
</tr>
<tr>
<td>Alcohol Use Disorders Identification Test score</td>
<td></td>
</tr>
<tr>
<td>Drinks usually alone</td>
<td></td>
</tr>
<tr>
<td>Reports life would be better if liquor stores closed</td>
<td></td>
</tr>
<tr>
<td>In favor of prohibition</td>
<td></td>
</tr>
<tr>
<td>Would increase liquor prices</td>
<td></td>
</tr>
</tbody>
</table>

*BACK TO TREATMENT GROUPS*
Intertemporal substitution: time of first drink

The graph shows the cumulative distribution function (CDF) for the time of first drink under different incentives and control conditions. The x-axis represents the time of first drink, ranging from 6 to 24 hours, while the y-axis represents the CDF, ranging from 0 to 1.

The graph includes three lines:
- Black line: Incentives
- Red line: Choice
- Green line: Control

The CDFs are compared across different time points to illustrate the effects of incentives, choice, and control on the timing of the first drink.

[BACK TO SUMMARY OF EFFECTS ON DRINKING]
## Times of office visit and first drink

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Visit</th>
<th>(2) Visit</th>
<th>(3) 1st drink</th>
<th>(4) 1st drink</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incentives</td>
<td>0.21*</td>
<td></td>
<td>1.39***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.114)</td>
<td></td>
<td>(0.442)</td>
<td></td>
</tr>
<tr>
<td>Choice</td>
<td>0.07</td>
<td></td>
<td>1.58***</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.111)</td>
<td></td>
<td>(0.381)</td>
<td></td>
</tr>
<tr>
<td>Pooled alcohol treat</td>
<td></td>
<td>0.13</td>
<td></td>
<td>1.50***</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(0.096)</td>
<td></td>
<td>(0.355)</td>
</tr>
<tr>
<td>Observations</td>
<td>2,850</td>
<td>2,850</td>
<td>2,915</td>
<td>2,915</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.070</td>
<td>0.067</td>
<td>0.263</td>
<td>0.262</td>
</tr>
<tr>
<td>Baseline survey controls</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Phase 1 controls</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Control group mean</td>
<td>19.16</td>
<td>19.16</td>
<td>17.01</td>
<td>17.01</td>
</tr>
</tbody>
</table>

Standard errors in parentheses, clustered by individual.

[BACK TO SUMMARY OF EFFECTS ON DRINKING]
Appendix

Incentives for sobriety increased deposits.

Cumulative Deposits by Treatment Group

- Alcohol treatment assigned
- Incentives and Choice Groups pooled
- Control Group

Day in Study

Cumulative deposits (Rs)
Incentives for sobriety reduced withdrawals.

Cumulative Withdrawals by Treatment Group

- Alcohol treatment assigned

Incentives and Choice Groups pooled
Control Group

Day in Study
Cumulative withdrawals (Rs)
−150 −100 −50 0
Sobriety incentives vs. commitment savings: deposits

Sobriety vs. Commitment Savings: Cumulative Deposits

- **Sobriety incentives, commitment savings**
- **Sobriety incentives, no commitment savings**
- **No sobriety incentives, commitment savings**
- **No sobriety incentives, no commitment savings**

Day in Study vs. Cumulative deposits (Rs)

0 200 400 600 800

0 5 10 15 20
Sobriety incentives vs. commitment savings: withdrawals

Sobriety vs. Commitment Savings: Cumulative Withdrawals

- Sobriety incentives, commitment savings
- Sobriety incentives, no commitment savings
- No sobriety incentives, commitment savings
- No sobriety incentives, no commitment savings

Cumulative withdrawals (Rs)
Day in Study

BACK TO SAVINGS SECTION
# Estimating the marginal propensity to save

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Rs saved</th>
<th>(2) Rs saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pooled alcohol treatment</td>
<td>13.37***</td>
<td>12.94**</td>
</tr>
<tr>
<td></td>
<td>(5.034)</td>
<td>(5.023)</td>
</tr>
<tr>
<td>Amount won in lottery on previous study day</td>
<td>0.31**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.145)</td>
<td></td>
</tr>
<tr>
<td>Pooled alcohol treatment X Lottery amount</td>
<td>0.36**</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.165)</td>
<td></td>
</tr>
<tr>
<td>Control Group X Lottery amount</td>
<td>0.22</td>
<td></td>
</tr>
<tr>
<td></td>
<td>(0.271)</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>3,435</td>
<td>3,435</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.114</td>
<td>0.114</td>
</tr>
<tr>
<td>Baseline survey controls</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Phase 1 controls</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Control mean</td>
<td>20.42</td>
<td>20.42</td>
</tr>
</tbody>
</table>

Standard errors in parentheses, clustered by individual.
Appendix

Savings by day 4 and day 19

Amounts Saved before and after Treatment Assignment

<table>
<thead>
<tr>
<th></th>
<th>Amount savings until day 4</th>
<th>Amount saved after day 4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Incentives</strong></td>
<td>100</td>
<td>500</td>
</tr>
<tr>
<td><strong>Choice</strong></td>
<td>200</td>
<td>400</td>
</tr>
<tr>
<td><strong>Control</strong></td>
<td>300</td>
<td>300</td>
</tr>
</tbody>
</table>

BACK TO POTENTIAL CONFOUNDS
Differential attendance did *not* cause the savings effects.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Rs/day</th>
<th>(2) Rs/day</th>
<th>(3) Rs/day</th>
<th>(4) Rs/day</th>
<th>(5) Rs/day</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pooled alcohol treatment</td>
<td>12.45**</td>
<td>13.41***</td>
<td>11.55**</td>
<td>17.15***</td>
<td>11.73**</td>
</tr>
<tr>
<td></td>
<td>(6.262)</td>
<td>(5.018)</td>
<td>(4.792)</td>
<td>(5.519)</td>
<td>(5.290)</td>
</tr>
<tr>
<td>High matching contribution</td>
<td>9.29</td>
<td>10.11**</td>
<td>11.65**</td>
<td>12.96**</td>
<td>12.06**</td>
</tr>
<tr>
<td></td>
<td>(6.532)</td>
<td>(4.873)</td>
<td>(4.619)</td>
<td>(5.057)</td>
<td>(4.967)</td>
</tr>
<tr>
<td>Commitment savings</td>
<td>7.59</td>
<td>2.88</td>
<td>2.86</td>
<td>4.66</td>
<td>4.51</td>
</tr>
<tr>
<td></td>
<td>(6.539)</td>
<td>(5.074)</td>
<td>(4.820)</td>
<td>(5.373)</td>
<td>(5.303)</td>
</tr>
<tr>
<td>Daily study payment (Rs)</td>
<td>0.35***</td>
<td>0.50***</td>
<td>0.35***</td>
<td>0.50***</td>
<td>0.50***</td>
</tr>
<tr>
<td></td>
<td>(0.050)</td>
<td>(0.123)</td>
<td>(0.050)</td>
<td>(0.123)</td>
<td>(0.123)</td>
</tr>
<tr>
<td>Observations</td>
<td>3,435</td>
<td>3,435</td>
<td>3,435</td>
<td>2,932</td>
<td>2,932</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.006</td>
<td>0.113</td>
<td>0.129</td>
<td>0.123</td>
<td>0.131</td>
</tr>
<tr>
<td>Baseline survey controls</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Phase 1 controls</td>
<td>NO</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Control mean</td>
<td>20.42</td>
<td>20.42</td>
<td>20.42</td>
<td>20.42</td>
<td>20.42</td>
</tr>
</tbody>
</table>

Standard errors in parentheses, clustered by individual.
On average, Choice Group earns Rs. 7 per day more than Control Group

- Control Group individuals earn Rs. 85 per day
- Incentive Group individuals earn Rs. 84 per day
- Choice Group individuals earn Rs. 92 per day

Could this account for the difference in savings?

- Marginal propensity to save from lottery: 0.22
- Suggests that any effects on savings were small.
Cumulative study payments

Cumulative Study Payments by Treatment Group

- Alcohol treatment assigned

Day in Study

Cumulative study payments (Rs)

Incentives, Choice, Control
## Appendix

### Savings as a share of study payments

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1) Share saved</th>
<th>(2) Share saved</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pooled alcohol treatment</td>
<td>0.09</td>
<td>0.09*</td>
</tr>
<tr>
<td></td>
<td>(0.071)</td>
<td>(0.054)</td>
</tr>
<tr>
<td>High matching contribution</td>
<td>0.11</td>
<td>0.11**</td>
</tr>
<tr>
<td></td>
<td>(0.071)</td>
<td>(0.052)</td>
</tr>
<tr>
<td>Commitment savings</td>
<td>0.12*</td>
<td>0.12**</td>
</tr>
<tr>
<td></td>
<td>(0.071)</td>
<td>(0.055)</td>
</tr>
</tbody>
</table>

- Observations: 2,932, 2,932
- R-squared: 0.006, 0.104
- Baseline survey controls: NO, YES
- Phase 1 controls: NO, YES
- Control mean: 0.259, 0.259

Standard errors in parentheses, clustered by individual.
Appendix
Commitment savings and present bias

△ Savings by $\beta$ for $Y = 1, M = 0.2$

$\gamma = 0.5$
$\gamma = 1.0$
$\gamma = 2.0$
Exposure to incentives increases demand for incentives.

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>(1)</th>
<th>(2)</th>
<th>(3)</th>
<th>(4)</th>
<th>(5)</th>
<th>(6)</th>
</tr>
</thead>
<tbody>
<tr>
<td>VARIABLES</td>
<td>Rs 90</td>
<td>Rs 90</td>
<td>Rs 90</td>
<td>Rs 150</td>
<td>Rs 150</td>
<td>Rs 150</td>
</tr>
<tr>
<td>Incentives</td>
<td>0.13*</td>
<td>0.15**</td>
<td>0.13*</td>
<td>0.14*</td>
<td>0.16**</td>
<td>0.14*</td>
</tr>
<tr>
<td></td>
<td>(0.075)</td>
<td>(0.070)</td>
<td>(0.070)</td>
<td>(0.081)</td>
<td>(0.077)</td>
<td>(0.078)</td>
</tr>
<tr>
<td>Choice</td>
<td>0.10</td>
<td>0.07</td>
<td>0.08</td>
<td>0.11</td>
<td>0.09</td>
<td>0.10</td>
</tr>
<tr>
<td></td>
<td>(0.079)</td>
<td>(0.074)</td>
<td>(0.074)</td>
<td>(0.079)</td>
<td>(0.078)</td>
<td>(0.078)</td>
</tr>
<tr>
<td>BAC during choice</td>
<td>-1.70***</td>
<td>-0.85**</td>
<td>-1.10***</td>
<td>-0.52</td>
<td>-0.52</td>
<td>(0.315)</td>
</tr>
<tr>
<td></td>
<td>(0.315)</td>
<td>(0.358)</td>
<td>(0.304)</td>
<td>(0.349)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exp sober days under incentives</td>
<td>0.10***</td>
<td>0.08***</td>
<td>0.06***</td>
<td>0.06***</td>
<td>0.06***</td>
<td>0.06***</td>
</tr>
<tr>
<td></td>
<td>(0.011)</td>
<td>(0.014)</td>
<td>(0.011)</td>
<td>(0.012)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.144</td>
<td>0.251</td>
<td>0.275</td>
<td>0.071</td>
<td>0.122</td>
<td>0.130</td>
</tr>
<tr>
<td>Control mean</td>
<td>0.494</td>
<td>0.494</td>
<td>0.494</td>
<td>0.313</td>
<td>0.313</td>
<td>0.313</td>
</tr>
</tbody>
</table>

Standard errors in parentheses, clustered by individual. Regressions control for order of choices.
Expected vs actual sobriety (week 2)

![Graph showing expected vs actual sobriety in week 2]

- **Expected** vs **Actual sobriety**

**EXPECTED VS ACTUAL SOBRIETY IN WEEK 3**
Appendix

Expected vs actual sobriety (week 2)

Expected vs actual sobriety (scatter)
Expected vs actual sobriety (week 3)
Appendix

Relationship between savings and BAC (no individual FE)
Appendix

Relationship between savings and BAC (with individual FE)

[Graph showing the relationship between BAC and amount saved per day (Rs).]

BACK TO SUMMARY OF CONCERNS