Alcohol and Self-Control
A Field Experiment in India

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November 28, 2014

JOB MARKET PAPER

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Abstract

High levels of alcohol consumption are more common among the poor. This could have economic consequences beyond mere income effects because alcohol impairs mental processes and decision-making. Since alcohol is thought to induce myopia, this paper tests for impacts on self-control and on savings behavior. In a three-week field experiment with low-income workers in India, I provided 229 individuals with a high-return savings opportunity and randomized incentives for sobriety among them. The incentives significantly reduced daytime drinking as measured by decreased breathalyzer scores. This in turn increased savings by approximately 60 percent. No more than half of this effect is explained by changes in income net of alcohol expenditures. In addition, consistent with enhanced self-control due to lower inebriation levels, incentivizing sobriety reduced the impact of a savings commitment device. Finally, alcohol consumption itself is prone to self-control problems: over half of the study participants were willing to sacrifice money to receive incentives to be sober, exhibiting demand for commitment to increase their sobriety. These findings suggest that heavy alcohol consumption is not just a result of self-control problems, but also creates self-control problems in other areas, potentially even exacerbating poverty by reducing savings.

*Department of Economics, Harvard University. Email: **fnschilb@fas.harvard.edu**. I am deeply grateful to Esther Duflo, Michael Kremer, David Laibson, and especially Sendhil Mullainathan for their encouragement, support, and patience over the course of this project. I also thank Nava Ashraf, Abhijit Banerjee, Dan Björkegren, Raj Chetty, Armin Falk, Ed Glaeser, Ben Golub, Rema Hanna, Simon Jäger, Larry Katz, Asim Khwaja, Annie Liang, Nathan Nunn, Rohini Pande, Daniel Pollmann, Matthew Rabin, Gautam Rao, Benjamin Schöfer, Heather Schofield, Josh Schwartzstein, Jann Spiess, Dmitry Taubinsky, Uyanga Turmunkh, Jack Willis, Tom Zimmermann, and participants of the development, labor, and behavioral lunches at Harvard for helpful discussions and feedback. Kate Sturla, Luke Ravenscroft, Manasa Reddy, Andrew Locke, Nick Swanson, Louise Paul-Delvaux, and the remaining research staff in Chennai performed outstanding research assistance. All errors are my own. Funding for this project was generously provided by the Weiss Family Fund for Research in Development Economics, the Lab for Economic Applications and Policy, Warburg Funds, the Inequality and Social Policy Program, the Pershing Square Venture Fund for Research on the Foundations of Human Behavior and an anonymous donor.

1 Introduction

Heavy alcohol consumption is correlated with poverty, yet the nature and consequences of this relationship are not well understood.[1] Poverty could cause demand for alcohol.[2] But alcohol may also be a cause of poverty. In particular, alcohol is known to affect myopia and self-control. If these effects are large, then heavy alcohol consumption could interfere with a variety of forward-looking decisions. By affecting savings rates, insurance decisions and human capital investments and earnings, alcohol could reduce wealth accumulation and deepen poverty. However, though theoretically possible, we do not know whether such effects are present or economically meaningful in practice.

This paper empirically tests for one such effect: the impact of alcohol on savings behavior. To examine this relationship, I conducted a three-week field experiment with 229 cycle-rickshaw pullers in Chennai, India, in which a randomly selected subset of individuals was offered financial incentives for sobriety. In order to estimate the impact of increased sobriety on saving, all participants were given an opportunity to save money at a high interest rate. Additionally, a cross-randomized subset of study participants was provided with a commitment savings feature that aimed at preventing individuals from withdrawing their savings before the end of the study. This feature allows me to consider the impact of increasing sobriety on self-control problems in savings behavior. In addition, I elicited willingness to pay for incentives for sobriety to identify the extent to which self-control problems contribute to the demand for alcohol.

The provision of incentives for sobriety significantly increased study participants' sobriety during their daily savings decisions, providing a "first stage" to estimate the impact of sobriety on savings behavior. Specifically, individuals who were given incentives for sobriety decreased their daytime drinking as measured by a 33 percent increase in the fraction of individuals who visited the study office sober. This increase in sobriety during the day translated into a moderate reduction in overall drinking. I estimate that the intervention reduced overall alcohol consumption and expenditures by 5 to 10 percent.

The key finding of this experiment is that alcohol distorts intertemporal choice by *causing* myopia and, hence, self-control problems. I find that offering incentives for sobriety increased individuals' daily savings at the study office by 60 percent compared to a control group

[1] In many countries, low-income individuals are in fact *more* likely to be abstinent from alcohol altogether. At the same time, in many countries including in India, heavy drinking is more common among the poor. This is described in more detail in the next section.

[2] Poverty may increase the short-run benefits of alcohol and, hence, create or exacerbate self-control problems related to alcohol. For instance, alcohol is known to be a powerful anesthetic (Woodrow and Eltherington 1988), and it can make individuals feel better about themselves ("drunken self inflation," Banaji and Steele (1989)), or relieve stress and anxiety ("drunken relief," Steele and Josephs (1988)).

that received similar average study payments independent of their alcohol consumption. The combined effects of increased earnings outside of the study and decreased alcohol expenditures explain about half of the observed increase in savings.[3] The remaining part of the increase in savings appears to be due to the effect of alcohol on time preferences. Consistent with this, though not a statistically significant difference, the estimated marginal propensity to save is almost twice as large for individuals who were offered incentives for sobriety as for individuals in the control group.

Complementary to the first result that sobriety incentives increased savings, I find that sobriety incentives and the commitment savings feature are substitutes in terms of their effect on savings. While the commitment option and sobriety incentives each individually increased subjects' savings, there was no additional effect of the savings commitment feature on savings by individuals who were offered sobriety incentives, and vice versa. This could be because increasing sobriety directly reduced present bias, as suggested by the psychology literature (Steele and Josephs 1990). An alternative explanation is that the consumption of alcohol, a key temptation good for this population, was sufficiently reduced by the intervention to mitigate the need for commitment savings. However, the intervention did not cause abstinence from alcohol altogether, but instead reduced drinking or shifted it to later times of the day. This fact suggests that a direct effect of alcohol on self-control during savings decisions is the most likely explanation.

Moreover, I find evidence that many participants wanted to reduce their alcohol consumption. Over 50 percent of subjects exhibited demand for commitment to increase their sobriety, indicating a greater awareness of and willingness to overcome self-control problems than found in other settings, for instance for smoking (Gine et al. 2010), or exercising (Royer et al. 2014). Specifically, in three sets of weekly decisions that each elicited preferences for sobriety incentives in the subsequent week, over half of study participants chose options that implied weakly dominated study payments. In addition, more than one third of the participants preferred incentives for sobriety over unconditional payments, even when the latter were strictly higher than the most subjects could earn with the incentives. These choices implied that individuals were willing to sacrifice study payments on the order of ten percent of daily income even in the best case scenario of visiting the study office sober every day. This finding provides clear evidence for a desire for sobriety by making future drinking more costly, in contrast to the predictions of the Becker and Murphy (1988) rational addiction model.[4]

[3]This calculation requires an estimate of the marginal propensity to save out of available income. I obtain this estimate by separately randomizing study payouts from a lottery and observing the impact on savings.

[4]Becker and Murphy (1988) showed that many of the behaviors by addicted individuals are, at least in theory, consistent with optimization based on stable preferences. However, Gruber and Koszegi (2001)

This high demand for commitment does not appear to be the result of misunderstandings. Willingness to pay for incentives did *not* decrease over time among individuals who were asked to choose repeatedly. In fact, past exposure to incentives *increased* individuals' demand for such incentives. Individuals who had been randomly selected to receive incentives for sobriety for 15 days were more likely to choose incentives for a subsequent week compared to individuals who had received payments independent of their sobriety. Further, individuals for whom incentives "worked"–those whose sobriety increased in response to incentives–were particularly likely to choose the incentives subsequently. Moreover, sobriety at the time of the choice predicted greater demand for incentives. Finally, the demand for incentives decreased in the cost of incentives.

The finding that alcohol causes self-control problems builds on psychology research on "alcohol myopia". This line of research aims to reconcile the seemingly contradictory effects of alcohol found in a large body of previous research.[5] Steele and coauthors argued that a defining feature of alcohol is that it *always* narrows individuals' attention, which in turn causes individuals to focus on present, salient, and simple cues. This leads to adverse effects in situations of "inhibition conflict," i.e. with two competing motivations, one of which is simple, present, or salient, and the other is complicated, in the future, or remote.[6] The behavioral-economics interpretation of this theory is that alcohol exacerbates present bias and therefore self-control problems in intertemporal choice. The findings from my experiment support this theory. Moreover, the results demonstrate that alcohol-induced myopia can have economically meaningful consequences.

subsequently challenged the implicit assumption of time-consistent preferences and replaced it with hyperbolic discounting as formalized by Laibson (1997). Given the similarity of predicted responses of consumption patterns to price changes by the two competing models, Gruber and Koszegi (2001) were not able to reject Becker and Murphy (1988)'s model in favor of their own. The ensuing literature produced suggestive, but no conclusive evidence in the smoking domain (Gruber and Mullainathan 2005). Two recent examples in the context of alcohol consumption, Bernheim et al. (2012) and Hinnosaar (2012), found mixed results. Finally, others models predict demand for commitment as well, including cue-based theories, dual-self models, or temptation and self-control models as in Thaler and Shefrin (1981), Laibson (2001), Gul and Pesendorfer (2001), Bernheim and Rangel (2004), Fudenberg and Levine (2006). For detailed overviews on the empirical and theoretical literature on commitment devices, see DellaVigna (2009) and Bryan et al. (2010).

[5]See Steele and Josephs (1990) for an overview on the series of papers on alcohol myopia by Claude Steele and coauthors. This paper also describes the large literature that finds heterogeneous effects of alcohol both within and across individuals. For instance, alcohol makes some people aggressive, yet others more altruistic. It can relieve or increase anxiety and tension. It can inflate egos, yet lead to depression.

[6]Steele and Josephs (1990) sought to explain a range of behaviors caused by alcohol, but they did not focus on savings decisions, or self-control problems in intertemporal choice. Cross-sectional studies, as described in the overviews by MacKillopp et al. (2011) and Perry and Carroll (2008), considered the relationship between "delayed reward discounting" (DRD) and addictive behavior. Many studies, including the ones on alcohol, found a correlation between impulsive DRD and drug abuse. However, the existence and direction of causality remain unclear. Some studies found that impulsive DRD pre-dates drug addiction, but this does not address the concerns about omitted variables. In experimental studies, Richards et al. (1999) did not find an effect of increased inebriation on DRD. Ortner et al. (2003) found mixed evidence.

The findings of this study add to the literature on poverty and self-control.[7] With the exception of Banerjee and Mullainathan (2010), this line of research has largely sought to explain choices between overall levels of current and future consumption, rather than to understand how and whether specific goods may cause time-inconsistent preferences. In contrast, this paper argues that focusing on specific temptation goods may not only be an effective way to help individuals overcome their self-control problems regarding these goods, but, in the case of alcohol, may also reduce self-control problems in other domains.

The paper also contributes to the growing literature on saving decisions among the poor (Karlan et al. 2014). The availability and design of savings accounts have recently been found to be important factors in savings behavior among the poor (Dupas and Robinson (2013), Ashraf, Karlan, and Yin (2006)). Existing studies emphasize the importance of technologies for committing to savings. My paper studies the impact of commitment to reduce alcohol consumption on savings behavior, and argue that attempts to increase savings among the poor should consider the role of alcohol.

Moreover, the results from this paper may inform alcohol policy, a much-debated topic in developing countries. In India, states have chosen a wide range of policy options ranging from prohibition (Gujarat) to government provision (Tamil Nadu), and private provision (Delhi) of alcohol.[8] When making such choices, policy-makers lack sufficient information on the causes and the impact of alcohol consumption, and the feasibility and effectiveness of policy options. This paper contributes to this knowledge by considering of the relationship between alcohol and self-control. Moreover, it conducts one of the first randomized evaluations of an intervention providing financial incentives for health-related behavior in developing countries.[9]

The remainder of this paper is organized as follows. Section 2 provides an overview of

[7]This literature goes back to at least Fisher (1930). It was recently revived by several theoretical and empirical contributions. On the theory side, Banerjee and Mullainathan (2010) and Bernheim et al. (2014) investigated the possibility of a poverty trap due to the association between poverty and self-control. Recent research on the empirical side includes Mani et al. (2013) and Mullainathan and Shafir (2013). For an excellent review, see Haushofer and Fehr (2014).

[8]See Rahman (2003) for a review of alcohol policy in India. In a major policy shift, Kerala has recently opted to move from government provision of alcohol to prohibition within the next ten years.

[9]Financial incentives have been found to be among the most successful policies to reduce drug consumption in general (Anderson et al. 2009), and alcohol consumption in particular (Wagenaar et al. 2009). This is the case for both incentives in the form of increased prices or taxes, even for heavy drinkers (Chetty et al. (2009), Cook and Tauchen (1982)), and in the form of contingency management, i.e. the use of monetary or non-monetary incentives for changing health-related behavior modification, and behavior therapy, especially in the addiction field. The evaluation of contingency management interventions has shown substantial short-term and in some instances long-term effects in a number of health-related domains (Higgins and Petry (1999), Petry et al. (2000), Prendergast et al. (2006), Loewenstein et al. (2007), Volpp et al. (2008), Charness and Gneezy (2009), or Higgins et al. (2012)). However, few such studies were conducted in developing countries, and none of these consider alcohol.

the study background, including alcohol consumption patterns in Chennai and in developing countries more generally. Section 3 describes the experimental design, characterizes the study sample, and displays randomization checks. Section 4 then considers the effect of increased sobriety on intertemporal choice, and Section 5 investigates the interaction between the effects of increasing sobriety and offering commitment savings. Section 6 provides estimates of the extent to which self-control problems contribute to the demand for alcohol, and Section 7 concludes.

2 Alcohol in Chennai, India, and developing countries

There is scarce information regarding drinking patterns in developing countries, especially among the poor. In this section, I first describe alcohol consumption among low-income individuals in Chennai, India, based on short surveys I conducted with 1,227 individuals. I then relate the observed patterns to existing data on alcohol consumption in India and in other developing countries.

2.1 Alcohol Consumption in Chennai

As a first step toward a systematic understanding of the prevalence of drinking among male manual laborers in developing countries, I conducted a short survey with 1,227 men from ten different low-income professions in Chennai.[10] Surveyors approached individuals from these groups during the day and asked whether they were willing to answer a short questionnaire about their alcohol consumption and take a breathalyzer test.[11] Based on these surveys, Figures 1 through 4 show summary statistics of drinking patterns for these professions.

The overall prevalence of alcohol consumption among low-income men is high (Figure 1). 76.1 percent of individuals reported drinking alcohol on the previous day, ranging across professions from 37 percent (porters) to as high as 98 percent (sewage workers).[12] In addition, on days when individuals consume alcohol, they drink considerable physical quantities (Figure 2). Conditional on drinking alcohol on the previous day, men of the different professions

[10]The prevalence of alcohol consumption among women in Chennai and in India overall is substantially lower. It has been consistently estimated to be below five percent in India, with higher estimates for North-Eastern states and lower estimates for Tamil Nadu (where Chennai is located) and other South Indian states (Benegal 2005). In the most recent National Family Health Survey (Round 3, 2005/6), the prevalence of reported female alcohol consumption was 0.1 percent (IIPS and Macro International 2008).

[11]To ensure a high participation rate, individuals were given Rs. 20 ($0.33) for their participation in this short survey. As result, only five out of 1,232 approached individuals declined to participate.

[12]Porters are individuals who help carry luggage or other items at train stations. Sewage workers spend their days working, and sometimes swimming, in waist-deep human sewage. These individuals report drinking heavily before and during work to numb themselves, in particular to the smell.

reported drinking average amounts of 4.0 and 7.0 standard drinks on this day.[13] Since alcohol is an expensive good, the resulting income shares spent on alcohol are enormous (Figure 3). On average, individuals reported spending between 9.2 and 43.0 percent of their daily income of Rs. 300 ($6) to Rs. 500 ($8) on alcohol. These numbers are particularly remarkable because many low-income men in Chennai are the sole income earners of their families.[14] Moreover, 25.2 percent of individuals were inebriated or drunk during these surveys, which all took place during the day (Figure 4).[15]

2.2 Alcohol Consumption in India and in Developing Countries

These figures demonstrate substantial levels of alcohol consumption among low-income groups in Chennai, which raises the question of how these numbers compare to other estimates for Chennai or India overall. Limited data availability and data inconsistencies make this task difficult. However, there is reason to believe that the estimates shown here are not unusual compared to other parts of India or other developing countries.

The daily average physical quantity consumed by male drinkers in India, about a quarter of the male population according to WHO (2014), is in fact slightly higher than the average of the physical quantities shown in Figure 2. According to WHO (2014) estimates, the average male Indian drinker consumes just over six standard drinks per day, exceeding the estimates for German, American, and even Russian drinkers in the same report.[16] In comparison, individuals who drank alcohol on the previous day in Chennai report on average drinking about 5.7 standard drinks per day. Looking beyond India, male drinkers in Uganda (56

[13] I follow the US definition of a standard drink as described in WHO (2001). According to this definition, a standard drink contains 14 grams of pure ethanol. A small bottle of beer (330 ml at 5% alcohol), a glass of wine (140 ml at 12% alcohol), or a shot of hard liquor (40 ml at 40% alcohol) each contain about one standard drink.

[14] The surveys reported here do not include questions about other family members and their incomes. However, female labor market participation is relatively low in Chennai. In my sample, less than a third of married men report that their wives earned income during the past month.

[15] Compared to other professions, the fraction of inebriated sewage workers is low given their reported expenditures and consumption. Anecdotally, this is explained by the fact that about a month before the surveys took place, one of the workers drowned in the sewage and his family was not given any severance payment because he was found to have been drunk at the time of the accident in an autopsy. After this incident, sewage workers stopped drinking at work, at least temporarily. Most individuals continued drinking alcohol regularly, but they did not drink during work hours.

[16] Some assumptions in this calculation can be questioned. In particular, the WHO (2014) calculates the number of drinks per drinker and day by dividing an estimate of the overall quantity consumed by the estimated fraction of drinkers in the population. Hence, underestimating the prevalence of drinking among males in India could lead to overestimates of the number of standard drinks per drinker. However, even adjusting for the somewhat higher prevalence according to IIPS and Macro International (2007), 31.9 percent rather than 24.8 percent in (WHO 2014), yields just under five standard drinks per drinker and day. In addition, other studies find significantly lower prevalence of drinking in India (e.g. Subramanian et al. (2005)).

percent of the male population) consume about 5 standard drinks per day. The fraction of drinkers is somewhat lower in other sub-Saharan countries, but the physical quantities consumed by drinkers are similarly high.[17] Alcohol consumption has also been steeply on the rise in China in recent years, where currently male drinkers (58.4 percent of the male population) consume 3.66 standard drinks per day.

There is also evidence that heavy alcohol consumption is more prevalent among the poor in developing countries. In India, both the prevalence of drinking and heavy alcohol consumption are more common among low-income and low-education individuals (Neufeld et al. (2005), Subramanian et al. (2005), IIPS and Macro International (2007)). Moreover, surveys among low-income groups show a commonly held belief that the positive correlation between excessive alcohol consumption and poverty reflects a causal relationship. For instance, in village surveys in Uganda, 56 percent of individuals believed that excessive alcohol consumption was a cause of poverty. Strikingly, this percentage was higher than the percentages of individuals that believed "lack of education and skills", "lack of access to financial assistance and credit", or "idleness and laziness" caused poverty. At the same time, a quarter of individuals viewed excessive alcohol consumption as an outcome of poverty (USAID 2003).

3 Experimental Design and Balance Checks

In this section, I first provide a broad overview of the experimental design of my study. Next, I describe the recruitment and screening procedures and, hence, the selection mechanism of potential study participants into the study. I then provide detailed information about the timeline and the treatment conditions, followed by a description of the mechanism to elicit willingness to pay for sobriety incentives. Finally, I describe the outcomes of interest of the experiment.

3.1 Overview on Experimental Design

In the field experiment, 229 cycle-rickshaw peddlers working in central Chennai were asked to visit a nearby study office every day for three weeks. During these daily visits, study participants completed a breathalyzer test and a short survey on labor supply, earnings, and alcohol consumption and expenditures. To study the impact of increased sobriety due to financial incentives on intertemporal choice, all subjects were given the opportunity to save money at the study office. Additionally, participants were randomly assigned to varying

[17] For instance, an average drinker in Rwanda is estimated to consume 5.32 standard drinks per day. These numbers are similar for Burundi (5.19 standard drinks), Kenya (4.46 standard drinks), and Tanzania (4.29 standard drinks).

conditions with the following considerations. First, to create exogenous variation in sobriety, a randomly selected subsample of study participants were offered financial incentives to visit the study office sober while the remaining individuals were paid for coming to the study office regardless of their alcohol consumption. Second, to examine the interaction between sobriety incentives and commitment savings, a cross-randomized subset of individuals were provided with a commitment feature on their savings account. Finally, to identify self-control problems regarding alcohol, a randomly selected subset of individuals were given the choice between incentives for sobriety and unconditional payments.

3.2 Recruitment and Screening

The study population consisted of male cycle-rickshaw peddlers aged 25 to 60 in Chennai, India.[18] Individuals enrolled in the study went through a three-stage recruitment and screening process. Due to capacity constraints, enrollment was conducted on a rolling basis such that there were typically between 30 and 60 participants enrolled in the study at any given point in time.

Field Recruitment and Screening. Field surveyors approached potential participants during work hours near the study office, and asked interested individuals to answer a few questions to determine their eligibility to participate in "a paid study in Chennai." Individuals were eligible to proceed to the next stage if they met the following screening criteria: (i) between 25 and 60 years old, inclusive, (ii) fluent in Tamil, the local language, (iii) having worked at least five days per week on average as a rickshaw puller during the previous month, (iv) having lived in Chennai for at least six months and without plans to leave Chennai during the ensuing six weeks, and (v) reporting an average daily consumption of 0.7 to 2.0 "quarters" of hard liquor (equivalent to 3.3 to 9.4 standard drinks) per day.[19] If an individual satisfied all field screening criteria, he was invited to visit the study office to learn more about the study and to complete a more thorough screening survey to determine his eligibility.

Office Screening. The primary goal of the more thorough office screening was to reduce the risks associated with the study, in particular risks related to alcohol withdrawal symptoms. The criteria used in this procedure included screening for previous and current medical con-

[18] This includes passenger cycle-rickshaw peddlers as in Schofield (2014) and cargo cycle-rickshaw peddlers. To avoid overlap between the two samples, passenger cycle-rickshaw peddler enrolled in the study were required to have a BMI above 20. Individuals in Schofield (2014) were required to have a BMI below 20.

[19] "Quarters" refer to small bottles of 180 ml each. Nearly 100% of drinkers among cycle-rickshaw pullers (and most other low-income populations) consume exclusively hard liquor, mainly rum or brandy, hence, maximizing the quantity of alcohol per Rupee. One quarter contains approximately 4.69 standard drinks.

ditions such as seizures, liver diseases, previous withdrawal experiences, and intake of several sedative medications and medications for diabetes and hypertension. This thorough medical screening procedure was strictly necessary since reducing one's alcohol consumption (particularly subsequent to extended periods of heavy drinking) can lead to serious withdrawal symptoms. If not adequately treated, individuals can develop delirium tremens, a severe and potentially lethal medical condition (Wetterling et al. (1994), Schuckit et al. (1995)).

Lead-in Period. Overall and differential attrition was a first-order concern because subjects were requested to visit the study office daily and the study payment structure varied across treatment groups. Early-stage piloting suggested that a substantial fraction of individuals would visit on the first day, which provided high renumeration, but then drop out relatively quickly. To avoid this outcome in the study, individuals who were eligible and willing to participate in the study were required to attend on three consecutive study days (the "lead-in period") before they were fully enrolled in the study and assigned their treatment status on day four of the study. Individuals were informed about this feature during their first visit to the study office. They were allowed to repeat the lead-in period once if they missed one or more of the three consecutive days.

The resulting selection process was moderate. At each stage, between 64 and 83 percent of individuals were able and willing to proceed to the subsequent stage (Table 4). Among individuals who were approached on the street to conduct the field screening survey, 64 percent were eligible and decided to visit the study office to complete the office screening survey. 21 percent were either not willing to conduct the survey when first approached (14 percent), or were not interested in learning more about the study after conducting the survey and being found eligible (7 percent). The majority among the remaining individuals (12 percent) conducted the survey, but did not meet the drinking criteria outlined above, primarily because they were abstinent from alcohol or reported drinking on average less than 3.3 standard drinks per day. During the next stage, the office screening survey, 83 percent of individuals were found eligible. The majority of ineligible individuals (13 percent) were not able to participate due to medical reasons. Finally, 66 percent of individuals passed the lead-in period. Importantly, leaving the study at this stage does *not* appear to be related to alcohol consumption as measured by individuals' sobriety during their first visit to the study office.

3.3 Timeline and Treatment Groups

Figure 5 provides an overview of the study timeline, the different activities, and the treatment conditions. All participants completed five phases of the study as described in more detail below. During the first four phases, consisting of 20 study days in total, individuals were asked to visit the study office every day (excluding Sundays). The office was located in the vicinity of their usual area of work to limit the time required for the visit. Participants could visit the study office at a time of their choosing between 6 and 10 pm. During Phase 1, the first four days of the study, all individuals were paid Rs. 90 ($1.50) for visiting the study office, regardless of their blood alcohol content (BAC). During this period, I gathered baseline data in the absence of incentives and screened for willingness to visit the study office regularly. Starting in Phase 2 and continuing through Phase 4, individuals were randomly allocated to one of the following three experimental conditions for the subsequent 15 days (days 5 to 19).

(I) **Control Group.** The Control Group was paid Rs. 90 ($1.50) per visit regardless of BAC on each of the fifteen days. That is, these participants continued with the payment schedule from Phase 1 throughout Phases 2 to 4.

(II) **Incentive Group.** The Incentive Group was given incentives for sobriety from days 5 to 19. These payments consisted of Rs. 60 for visiting the study office, and an additional Rs. 60 if the individual was sober as measured by a zero breathalyzer test. Hence, their payment was Rs. 60 ($1) if they arrived at the office with a positive BAC and Rs. 120 ($2) if they arrived sober.

(III) **Choice Group.** The Choice Group was given the same incentives as the Incentive Group for three days (days 5 to 7). Then, at the beginning of Phase 3 (day 7) and Phase 4 (day 13), they were asked to choose for the subsequent week (six study days) whether they preferred to continue receiving the same incentives, or to receive unconditional payments, as described in detail below.

Eliciting Willingness to Pay for Incentives. Subjects in the Choice Group were asked to choose between incentives and unconditional payments on days 7 and 13 of the study. On these days, surveyors elicited individuals' preferences in each of the three choices shown in Table 1. Each of these choices consisted of a tradeoff between two options. The first option, Option A, was the same for all choices. This option was simply to receive the same incentives for sobriety as described above for the Incentive Group, i.e. a payment of Rs. 60 ($1) for arriving with a positive BAC, and Rs. 120 ($2) for arriving with a zero BAC. In contrast, Option B varied across the three choices, with unconditional amounts of Rs. 90, Rs. 120, and Rs. 150.

To gather as much information as possible while ensuring incentive compatibility, preferences for all three choices were elicited and one choice was randomly selected to be implemented. However, to maintain similar average study payments across treatment groups, Choice 1 was implemented in 90 percent of choice instances (independent over time) so that particularly high payments were only offered to a small number of individuals in the Choice Group.

	Option A		**Option B**
Choice	BAC > 0	BAC $= 0$	regardless of BAC
(1)	Rs. 60	Rs. 120	Rs. 90
(2)	Rs. 60	Rs. 120	Rs. 120
(3)	Rs. 60	Rs. 120	Rs. 150

Table 1: Choices between Incentives for Sobriety and Unconditional Payments

These choices are designed to elicit demand for commitment to sobriety and, hence, potential self-control problems regarding alcohol consumption. Choice of the conditional payment (Option A) in Choice 1 is *not* conclusive evidence that the individual would like to receive incentives to increase his sobriety. This is because even an individual who did not prefer changing his drinking patterns may have chosen this option if he expected to visit the study office sober at least 50 percent of the time and, hence, receive higher average study payments from choosing Option A than from Option B. In contrast, study payments for Option A were designed to be weakly dominated to the ones in Option B for Choice 2. Hence, choosing the conditional payment (Option A) in this choice implied demand for commitment to increase sobriety. Similarly, study payments in Option A were strictly dominated by the ones in Option B for Choice 3. Choosing Option A implied lower study payments (by Rs. 30 per day) for the subject even in the best case of visiting the study office sober on all subsequent days.

Given low literacy and numeracy levels among study participants, these choices were designed to be as simple as possible given the research objectives. Hence, Option A was kept constant across choices and individuals were given three days to familiarize themselves with these incentives during Phase 2. Accordingly, in all three choices, one option was known to subjects from previous office visits, and the other option was simply a fixed payment regardless of BAC. To address potential concerns regarding anchoring effects, the order of choices was randomized. That is, half of participants made their choices in the order as outlined above, and the remaining individuals completed the choices in the opposite order.

At the end of Phase 4 (on day 20 of the study), all study participants were given the same set of three choices, described above. This allows me to understand whether exposure to incentives for sobriety affected subsequent demand for incentives. Again, preferences for all three choices were elicited, and then one of them was randomly selected to be implemented. However, the choices at the end of the study were only implemented for a randomly selected five percent of individuals for budgetary and logistical reasons. Daily visits to the study office ended on day 20 for all study participants whose choices were not selected to be implemented.

Follow-up Visits. To measure the effects of the intervention beyond the incentivized period, surveyors attempted to visit all individuals about one week after their last scheduled office visit. This visit was announced during the informed consent procedure, but subjects were not informed regarding the exact day of this visit. During the follow-up visits, individuals were breathalyzed and surveyed on the main outcomes of interest.

3.4 Lottery

In addition to the payments described above, study participants were given the opportunity to win additional earnings from the study in a lottery that was conducted on days 10 to 18. The lottery was conducted as follows: If the participant arrived at the study office on a day on which he was assigned to play the lottery, he was given the opportunity to spin a 'wheel of fortune'. This gave him the chance to win a voucher for Rs. 30 or Rs. 60, at a probability of approximately 5 percent each. This voucher was valid only on the participant's subsequent study day, i.e. if the participant came back on the following study day and showed the voucher, he was given the equivalent cash amount at the beginning of his visit. The lottery allows me 1) to estimate the impact of increased study payments on labor supply and earnings, 2) to estimate the impact of study payments on attendance and savings at the study office, and 3) to test whether sobriety incentives raised the marginal propensity to save.

3.5 Savings Treatments and Outcomes of Interest

The main outcomes of interest in this study are: (i) alcohol consumption and expenditures, (ii) savings behavior, and (iii) labor market participation and earnings. Each of these outcomes is described below.

Alcohol Consumption data was collected daily (except for Sundays) by measuring individuals' blood alcohol content (BAC), and via self reports regarding quantities consumed and amounts spent on alcohol. BAC was measured via breathalyzer tests using devices with US

Department of Transportation level of precision.[20] In addition, to cross-check self-reported drinking patterns, a randomly selected subset of subjects was visited unannounced between 7:30 pm and 10 pm[21] for random breathalyzer tests.[22]

Savings behavior was measured by giving all study participants the opportunity to save money in an individual savings box at the study office. During each office visit, study participants had the opportunity to save up to Rs. 200, using either payments received from the study or money from other sources. The entire amount saved, and the matching contribution described below, was paid out on the participants' last day of the study (day 20). Two features of the savings opportunity were cross-randomized across sobriety incentive treatment groups.

(i) **Matching Contribution Rate.** To encourage individuals to save they were given a matching contribution ("savings bonus"). During their last day in the study (day 20), subjects received the amount they had chosen to save until then plus a matching contribution, randomized (with equal probability) to be either 10% or 20% of the amount saved. Hence, even in a setting with extremely high daily interest rates, saving money at the study office was a high-return activity for many study participants.[23]

(ii) **Commitment Savings.** Half of study participants were randomly selected to have their savings account include a commitment feature. Instead of being able to withdraw money during any of their daily visits between 6 and 10 pm, they were only allowed to withdraw money at the end of their participation in the study.[24] Notably, the savings option for the remaining individuals also entailed a weak commitment feature. While individuals could withdraw as much as they desired on any given office visit, they were only able to withdraw money in the evenings, i.e. between 6 and 10 pm.[25]

[20] As in Burghart, Glimcher, and Lazzaro (2013), this study uses the breathalyzer model AlcoHawk PT500 (Q3 Innovations LLC), with precision comparable to breath alcohol meters used by law enforcement agents in the US. For more information, see O'Daire (2009).

[21] Ideally these test would have been conducted at later times in the night to fully capture individuals' drinking patterns at night. However, staff constraints, safety considerations, and the intrusive nature of visiting individuals late at night at their homes made it infeasible to conduct these tests after 10 pm.

[22] These tests were only conducted for the subset of individuals who consented to be visited unannounced. However, since the renumeration for these visits was deliberately chosen to be high (Rs. 100 for a successful visit regardless of the outcome of the breathalyzer test), the fraction of individuals that agreed to be randomly breathalyzed was nearly 100 percent.

[23] Moreover, the daily interest rate further increased for each participant over the course of his participation in the study.

[24] For ethical reasons, all individual had the option to leave the study and withdraw all of their money at any day in the study.

[25] This feature was meant to prevent individuals from showing up during the day and to withdraw money to drink alcohol.

The savings option served three purposes. First, it allows me to study how increased sobriety affects savings behavior and, more generally, how drinking alcohol affects inter-temporal choices and individuals' investment in high return opportunities. Second, it was meant to help study participants avoid using the money received from the study to drink alcohol on the same evening or on subsequent days. Third, the two cross-randomized features allow me to understand the interaction with and to benchmark the effects of reduced alcohol consumption on savings.

Labor market outcomes included reported earnings, labor supply, and productivity. These outcomes are measured by individuals' self-reports during the baseline survey, daily surveys, and the endline survey. Reported earnings are a combination of income from rickshaw work and other sources such as load work. Labor supply is a combination of the number of days worked per week and the number of hours worked per day. Finally, productivity is measured as income per hour worked.

3.6 Sample Characteristics and Randomization Checks

Appendix Tables A.1 through A.3 summarize study participants' key background characteristics, and demonstrate balance on these characteristics across treatment groups. Tables A.1 and A.2 give an overview of basic demographics, and work- and savings-related variables. As to be expected with a large number of comparisons, there are imbalances for some characteristics. However, overall only 5 out of 72 coefficients are statistically significantly different at the 10 percent level, and 3 coefficients are significantly different at the 5 percent level.[26] Notably, individuals in the Control Group reported lower savings at baseline than in the two sobriety incentive treatment groups. Baseline savings are calculated as the sum of amounts saved in a number of different options including savings at home in cash or in gold or silver, with relatives and friends, with self-help groups, or with shopkeepers, as reported in the baseline survey. While the difference is not statistically significant in the comparisons between the Incentive and Choice Group with the Control Group individually, it is for the comparison between the Control Group and the two pooled sobriety incentive treatment groups. As illustrated in the Appendix Figure A.1, this difference is driven entirely by six individuals who reported very high savings, among them one individual in the Choice Group

[26] Among the demographics in Table A.1, the Control Group reports having lived for a few years longer in Chennai, and they are more likely to have electricity and a TV. In addition, they are somewhat less likely to own a rickshaw. In contrast, the overall fraction of individuals who reports 'lack of money' as a reason for not owning a rickshaw is balanced across treatment groups. Other reasons for not owning a rickshaw include not having a safe place to store it, or getting it provided by an employer.

who reported in the baseline survey having Rs. 1 million in cash savings at his home.[27]

There are several reasons to believe that this is not driving the savings result shown below. First, as shown in the last row of Table A.2, in the unincentivized Phase 1 there are only small differences in savings at the study office across treatment groups. Second, as shown in the regressions in Table 9, controlling for savings reported in the baseline survey and Phase 1 savings does not affect the regression results. If anything, the estimates of the treatment effect becomes larger. Third, there is no clear link between savings reported at baseline and savings in the study. Among the six individuals who reported total savings above Rs. 200,000 in the baseline survey, four are in the Choice Group, and two are in the Incentive Group.[28] Only two of them, both in the Choice Group, saved more than the average study participant in the course of the study.[29] Excluding these two individuals from the analysis does not change the conclusions of the study.[30]

Table A.3 shows balance of alcohol consumption at baseline. Only one of the 36 comparisons shows statistically significant differences at the 10 percent level. Compared to the Control Group, individuals in the Choice Group report somewhat lower alcohol expenditures per day.

4 Does Alcohol Distort Intertemporal Choice?

Time preferences are a fundamental aspect of decision-making and critical for consumption-savings decisions. Savings can increase future consumption and serve as a buffer against adverse shocks, such as health emergencies. Accordingly, savings behavior among the poor and the impact of offering different savings accounts to low-income individuals in developing countries have received considerable attention.[31] This literature largely focuses on the availability of different savings technologies and their potential impact on savings behavior (Ashraf et al. 2006) and other outcomes such as investment in health (Dupas and Robinson 2013). There is less emphasis on determinants of savings behavior and on heterogeneity in take-up or impact for given technologies. In this section, I present evidence that alcohol distorts intertemporal choice by causing present bias and, hence, self-control problems in savings decisions. I show that increasing sobriety can impact individuals' savings behavior beyond

[27] This amount was confirmed not only in the endline survey, but also in a subsequent follow-up.

[28] This outcome is less likely than it may seem. The probability of that none of the six high savers were allocated into the Control Group is $(2/3)^6 \approx 9\%$.

[29] Three of the remaining four individuals saved a total of Rs. 50 or less, and the fourth individual saved Rs. 500 in the course of the study.

[30] This is because these individuals already saved high amounts in the unincentivized Phase 1, and the below regressions control for this.

[31] For a review of recent work, see Karlan et al. (2014).

effects on available income net of alcohol expenditures. This evidence is complemented by Section 5, which shows that sobriety incentives lower the impact of a commitment savings feature on savings.

In my experiment, there is a strong correlation between daily amounts saved at the study office and BAC measured during the same office visits, both across participants and within participants over time (Figure 7). Individuals who, on average, exhibited higher sobriety also saved more. Moreover, individuals in the Control Group saved more during study office visits with lower levels of inebriation than the same individuals during high-inebriation visits. The remaining part of this section considers whether this correlation reflects a causal impact of alcohol consumption on individuals' savings behavior.

4.1 The Impact of Incentives on Alcohol Consumption (First Stage)

Understanding the causal impact of alcohol on savings behavior requires exogenous variation in sobriety. This section considers the impact of financial incentives on alcohol consumption. While the outcomes in this section are of interest independently, they can also be viewed as a first stage for the subsequent analysis of the impact of increased sobriety on savings decisions. First, I describe the impact of incentives on sobriety at the study office, which captures the effect of incentives on daytime drinking. Second, I consider the treatment effect on overall alcohol consumption and expenditures.

In summary, financial incentives significantly reduced daytime drinking, but they only had a moderate effect on overall drinking (Table 5). Financial incentives had a sizable effect on daytime drinking (left panel of Table 5), as measured by the fraction of individuals showing up sober, measured BAC, and the reported number of standard drinks before coming to the study office. The estimated treatment effects for all three measures correspond to a 33% change relative to the mean in the Control Group. However, this effect translates into only a moderate reduction of overall drinking (right panel of Table 5). Reductions in self-reported consumption and expenditures are relatively small (5.0 to 9.5 percent decrease), and, while larger in relative terms, the effect on reported abstinence is only moderate (2 percentage points) and statistically insignificant.

4.1.1 The Impact of Sobriety Incentives on Daytime Drinking

Financial incentives significantly increased sobriety during the day, as measured by the fraction of individuals who visited the study office and had negative breathalyzer tests among

all individuals in the respective treatment groups (upper panel of Figure 6).[32] In the pre-incentive period (i.e. on days 1 through 4 of the study), there are only small differences in sobriety across treatment groups. In each group, about half of the individuals visited the study office and had a zero breathalyzer score. While this fraction slightly decreased in the Control Group over the course of the study, individuals in both the Incentive and Choice Groups are about ten percentage points more likely to show up sober than in the Control Group (day 5). Remarkably, the two treatments had a nearly identical effect on the fraction of individuals who visited the study office sober. This is not a surprise in Phases 1 and 2 since the payment structure was the same in the Incentive and Choice Groups at the beginning of the study. However, overall sobriety levels in these two groups remained very similar even once individuals were given the choice of whether they wanted to continue receiving incentives at the beginning of Phase 3. The Incentive Group was then slightly more likely to visit the study office sober compared to the Choice Group in Phase 4. This suggests that the individuals in the Choice Group who, if incentivized, were willing and able to visit the study office sober also chose the incentives when given the choice.

The corresponding regressions in Table 6 confirm the visual results. Individuals in the Incentive and Choice Group were approximately ten percentage points more likely to visit the study office sober, respectively (column 1). The estimated effects increase to 13 percentage points when regressions include baseline survey and Phase 1 controls, in particular sobriety in Phase 1 (columns 2 to 4). This corresponds a 33 percent increase compared to the Control Group. Conditional on visiting the study office, individuals' measured blood alcohol content (BAC) in the Incentive Group was four percentage points lower than in the Control Group (columns 5 through 7). The estimate is smaller for the Choice Group, which also lowers the pooled estimate (column 8). Nonetheless, the three percentage-point decrease in BAC shown represents a 33 percent reduction compared to the Control Group. Moreover, both treatments reduced the reported number of drinks before coming to the study office by about one standard drink from a base of just under three standard drinks (columns 9 through 12). The point estimate for the pooled treatment effect, 0.98 standard drinks (column 12), corresponds to a reduction of 33 percent as well.

[32]The outcome measure used to assess this is the fraction of individuals who arrived sober at the study office among *all* participants who were enrolled (as opposed to among individuals who visited the study office). That is, anyone who did not visit the study office on a particular day is counted as "not sober at the study office," along with individuals for whom a positive BAC was measured when they visited the office. Since attendance in the Incentive Group is lower than in the Control Group, this measure is preferable to other measures of sobriety as it less vulnerable to attrition concerns.

4.1.2 The Impact of Sobriety Incentives on Overall Drinking

The three sets of estimates in Table 7 show that the estimated treatment effect on overall alcohol consumption is substantially lower than the estimated effect on daytime drinking. First, both treatments reduced reported overall alcohol consumption by about 0.3 standard drinks per day (columns 1 to 4), about a third of the effect on the reported number of drinks before coming to the study office described above. None of these estimates are statistically significant. Second, the reduction at the extensive margin of drinking was small at best (columns 5 to 8). The point estimate for the pooled treatment effect suggests a 2 percentage point increase in reported abstinence (column 8), but none of the estimates is statistically significant. Third, the treatment effect on reported overall alcohol expenditures is about Rs. 10 per day (columns 9 to 12), with a point estimate of Rs. 8.7 for the pooled treatment effect, statistically significant at the ten percent level. Taken together, these estimates provide evidence that subjects who responded to the incentives mostly shifted their alcohol consumption to later times of the day rather than reducing their overall consumption.

4.1.3 The Role of Differential Attendance

The estimated effect of incentives on sobriety were not caused by differences in attendance across treatment groups (lower panel of Figure 6 and Table 8). Before considering differences across treatment groups, it is worth noting that overall attendance was high. Across all treatment groups and days of the study, attendance is 88.4% overall, and 85.4% post treatment assignment (day 4).[33] However, compared to the Choice and Control Groups, individuals in the Incentive Group were 7 percentage points less likely to visit the study office post Phase 1. This attendance gap arises with the start of Phase 2, i.e. with the assignment of the treatment groups, and remained relatively constant thereafter. Anecdotal evidence suggests that this difference in attendance was caused by individuals in the Incentive Group who were not able or willing to remain sober until their study office visit (i.e. at least until 6 pm) on some days, and, hence, faced reduced incentive to visit the study office on these days. This explanation is consistent with the fact that there was no attendance gap between the Choice and Control Groups because individuals for whom sobriety incentives were not effective or preferable could select out of them.

On average, the Incentive Group was seven to eight percentage points less likely to visit the study office compared to the Control Group (column 1 of Table 8). Moreover, though not statistically significant, surprisingly, higher sobriety during the unincentivized Phase 1 *negatively* predicts subsequent attendance (column 2). This appears to be the case in the

[33] By construction, attendance in the lead-in period (Phase 1) is 100%.

Incentive and Control Groups, but not in the Choice Group (column 3). Finally, on average, baseline savings significantly predict subsequent attendance (column 4). However, there is no evidence that the two treatments made high savers more likely to visit the study office. If anything, the opposite was the case (column 5). This strongly suggests that differential attendance of high savers does not explain the savings results shown below.

4.2 Did Increased Sobriety Change Savings Behavior?

The Incentive and Choice treatments increased savings (upper panel of Figure 8 and Table 9). Until day 4, when individuals learnt about their main treatment status, average amounts saved were nearly identical across treatment groups. Individuals in the Incentive and Choice Groups saved approximately 50 percent more subsequently. After the start of the incentivized period, individuals in the the Incentive and Choice Groups saved 46 percent and 65 percent until the end of the study (Rs. 446 and Rs. 505 in the Incentive and Choice Groups, respectively, compared to Rs. 306 in the Control Group). Notably, the difference in savings across treatment groups did not emerge immediately after the beginning of the incentivized period, but accumulated mainly between days 8 and 15.

The corresponding regression results in Table 9 confirm the visual evidence. Individuals in both the Incentive and Choice Groups saved more money at the study office, though only the coefficient for the Choice Group is statistically significant at the 10 percent level. The pooled estimate shows a treatment effect of Rs. 12.45, corresponding to an increase of 61 percent compared to Control Group savings of Rs. 20.42. This estimate–as well as both of the individual estimates in column 1–is larger than the coefficients for both the high matching contribution and the commitment savings option. Hence, incentives for sobriety had a larger effect than increasing the matching contribution on savings from 10 to 20 percent, or introducing a commitment feature on the savings option.[34] Importantly, these estimates are ITT estimates, i.e. they measure the impact of *offering* incentives for sobriety. That is, while only effective for a relatively small fraction of individuals as shown above, sobriety incentives increased savings by 61% overall.[35]

[34] As discussed above, even individuals in the "no commitment savings" group were given a weak commitment feature since they were only able to withdraw money during their study visits between 6 and 10 pm. Hence, the estimate for "commitment savings" is likely an underestimate of the impact of commitment on savings.

[35] Since BAC levels differed across treatment groups conditional on visiting the study office with a positive blood alcohol content, using the difference in the fraction sober to calculate a ToT is not accurate.

4.3 Robustness and Potential Confounds

Before examining the potential channels of the described effect of sobriety incentives on savings, this subsection investigates three potential confounds.

(I) Pre-existing differences across treatment groups. As shown in the upper panel of Figure 8, the amounts saved by day 4 are nearly identical across treatment groups. In addition, controlling for baseline savings and the baseline characteristics from Section 3.6 both decreases standard errors and increases point estimates (columns 2 and 7 of Table 9). The resulting point estimate for the pooled regression in column 4 is Rs. 13.44 and statistically significant at the 1 percent level (column 7).

(II) Differential study payments across treatment groups could have been responsible for the increase in savings in the two treatment groups. However, as shown in the lower panel of Figure 8, while on average, the Choice Group received slightly higher study payments (Rs. 7 per day) compared to the Control Group, the Incentive Group received slightly lower study payments. This implies that differences in average study payments cannot explain higher savings in both treatment groups. Consistent with this, controlling for study payments does not substantially alter the estimated treatment effects (columns 3 and 8 in Table 9). The estimate for the pooled treatment effect decreases slightly to Rs. 11.57 per day.

(III) Differential attendance could have caused the increase in savings. However, as discussed in Section 4.1.3, while attendance was nearly identical in the Choice and Control Groups, it was in fact significantly *lower* in the Incentive Group. In addition, as also discussed above and shown in column 5 of Table 8, if anything, the two treatments caused high savers to show up *less*. Accordingly, restricting the sample to days when individuals showed up at the study office increases the estimated treatment effects of offering incentives for sobriety, as shown in columns 7 through 10 of Table 9.

4.4 Changes in Available Resources

The above analysis shows that incentivizing sobriety significantly increased savings at the study office. This paper argues that this effect reflects changes in intertemporal preferences due to increased sobriety. However, an alternative or complementary channel could be increased overall available resources, either due to reduced overall alcohol expenditures or increased earnings. In this section, I consider the contribution of these channels to the increase in savings. I estimate this contribution to be about one third of the treatment effect

on savings, and attribute the remaining share to a change in preferences.

4.4.1 Estimating the Marginal Propensity to Save

Assessing the contribution of increased resources requires knowledge of the marginal propensity to save out of additional resources. The lottery allows me to estimate the marginal propensity to save. Table 10 shows regressions of the daily amounts saved on a dummy for the pooled alcohol treatment as well as the amount won in the lottery on the previous day, and interactions of the treatment dummies with the lottery amount.[36] These regressions show a marginal propensity to save of 0.15 to 0.21 in the Control Group, and 0.36 to 0.37 in the pooled alcohol treatment groups. The below calculations use the marginal propensity to save from the Control Group in the preferred specification in column 4 of Table 10. In addition, while the difference is not statistically significant, the estimated marginal propensity to save is higher (0.38, statistically significant at the 5 percent level) for the two groups that received sobriety incentives compared to the Control Group (0.21, insignificant). Importantly, this difference is unlikely to be explained by the aforementioned confounds or increases in overall resources.

4.4.2 Reduced Alcohol Expenditures

Alcohol is an expensive good for low-income individuals in Chennai. Cycle-rickshaw peddlers spend a large fraction of their income on alcohol, on average, about Rs. 100 on alcohol per day. Hence, even relatively small reductions in alcohol consumption can significantly increase the overall resources available. The above estimates of the impact of the intervention on alcohol consumption patterns find that the two treatments decreased alcohol expenditures by between Rs. 4.7 (using the implied expenditure reduction based on the reported physical quantities consumed) to Rs. 8.7 per day (using the estimate from reported expenditures). Using the estimates of the marginal propensity to save from available resources of 0.21 in the Control Group[37] (see Table 10), this implies that reduced alcohol expenditures account for Rs. 1.0 to Rs. 1.8 in increased savings.

4.4.3 Increased Earnings

In addition to reduced alcohol expenditures, the treatments may have affected available resources via increased earnings since alcohol consumption may interfere with individuals'

[36] The regressions also control for whether the lottery was conducted on the previous day.

[37] I use the estimated marginal propensity from the Control Group since the purpose of this exercise is to understand the effect of increased resources for *given* preferences.

ability to earn income.[38] While positive, I estimate the effect of sobriety incentives on earnings to be relatively small and statistically insignificant, with a point estimate for the pooled treatment effect of Rs. 14.2 per day. Using this estimate and the marginal propensity to save from above, this implies that increased earnings account for Rs. 3.0 in increased savings.

4.5 Decomposition of the Impact of Increased Sobriety on Savings

This section gives a summary of the results so far, as displayed in Table 2. The starting point in this decomposition is the estimate of Rs. 13.44 for the overall pooled treatment effect in column (7) of Table 9. From this effect, I subtract the contribution of the three effects described above: (i) the effect of study payments, (ii) the contribution of reduced alcohol expenditures, and (iii) the contribution of increased earnings. This leaves a remaining unexplained treatment effect of Rs. 6.76, i.e. about half of the overall treatment effect, and 33% of control group savings. In principle, this could reflect a change in present bias or a change in long-run discount factors. However, the latter seems unlikely because of the high interest rate implicit in the matching contribution offered to participants.

Estimated treatment effect	**Rs. 13.44**
Effect of study payments	Rs. 1.87
Budgetary effect 1: reduced expenditures	Rs. 1.83
Budgetary effect 2: increased earning	Rs. 2.98
Remaining treatment effect	**Rs. 6.76**

Table 2: Decomposing the impact on savings

[38] Irving Fisher (1926) was among the first to investigate the relationship between alcohol and productivity. Based on small-sample experiments by Miles (1924) that showed negative effects of alcohol on typewriting efficiency, he argued that drinking alcohol slowed down the "human machine". He also argued that industrial efficiency was one of the main reasons for the Prohibition. While many studies since Fisher (1926) have considered the relationship between alcohol consumption, income, and productivity (for an overview, see Science Group of the European Alcohol and Health Forum (2011)), there is a dearth of well-identified studies of the causal effect of alcohol on earnings and productivity, especially in developing countries. Cook and Moore (2000) summarized the literature as follows: "Modern scholars studying productivity effects have enjoyed larger sample sizes but unlike Fisher have utilized non-experimental data. The typical econometric study estimates the productivity effects of drinking, utilizing survey data in which respondents are asked about their drinking, work, income, and other items. The dependent variable is a measure of earnings or hours worked, while the key independent variable is a measure of the quantity or pattern of contemporaneous drinking, or alcohol-related psychiatric disorder (alcohol dependence or abuse)."

5 Are sobriety and commitment savings substitutes?

The previous section showed evidence that providing incentives for sobriety caused more patient savings decisions. The structure of the experiment allows for an additional test of the hypothesis that increasing sobriety lowers self-control problems. The intuition for this test is straightforward. If self-control problems prevent individuals from saving as much as they would like to, and if commitment savings products help sophisticated individuals overcome these problems, then commitment savings should have a larger effect for individuals with more severe self-control problems. Hence, if alcohol reduces self-control, then increasing sobriety should lower the effect of commitment savings.

However, this intuition overlooks an additional, opposing effect. While commitment savings products may help individuals overcome self-control problems in future savings decisions, the immediate decision to save requires incurring instantaneous costs. Hence, a sophisticated individual with severe self-control problems may not save much even if a commitment savings product is offered, simply because he does not put much weight on future consumption. In the extreme case, for β close to zero, an individual will not save regardless of the availability of a commitment option. The next section shows a simple model that formalizes this intuition. I then consider a specific case (log utility) to demonstrate three features of this model. First, the impact of commitment savings is an inverse-U shaped function in present bias for sophisticated individuals. Second, this implies that the impact of commitment savings options is not only low for individuals that don't have self-control problems ($\beta \approx 1$), but also for individuals with the most severe self-control problems ($\beta \approx 0$). That is, at least in theory, for individuals with the greatest need to overcome self-control problems, commitment savings devices in the form in which they are often offered may only be moderately helpful (if at all).[39] Third, for the relevant parameter range of β, an increase in β lowers the impact of commitment savings on savings. Accordingly, a decrease in the impact of commitment savings due to increased sobriety, as demonstrated in Section 5.3, can be viewed as evidence for increased self-control due to increased sobriety.

5.1 Present Bias and the Impact of Commitment Savings

Consider a simple consumption-saving problem. A consumer lives for three periods. In Period 1 he receives an endowment Y_1. There are no other income sources in Periods 2 and 3, but the consumer is paid a matching contribution of M times the amount saved by the

[39]Note that interventions designed along the lines of the Save More Tomorrow program (Thaler and Benartzi 2004) overcome this problem, since it allows individuals to commit to saving more without reducing today's consumption.

start of Period 3. In Periods $t = 1, 2$, he has to decide how to allocate his available resources into instantaneous consumption c_t or savings. The instantaneous utility function $u(c_t)$ is increasing and concave: $u'(\cdot) > 0$ and $u''(\cdot) < 0$. The consumer has β-δ time preferences as in Laibson (1997), with $\delta = 1$ for simplicity and $\beta \in (0, 1]$. The individual is sophisticated in the O'Donoghue and Rabin (1999) sense. He understands the extent of future self-control problems, i.e. he knows his future β. There is no uncertainty. In period 1, he maximizes $U_1(c_1, c_2, c_3) \equiv u(c_1)+\beta[u(c_2)+u(c_3)]$ and in period 2 he maximizes $U_2(c_2, c_3) \equiv u(c_2)+\beta u(c_3)$.

No commitment savings. Consider first a situation without commitment savings. We solve the problem recursively. In period 3, the individual will consume the entire amount saved plus the matching contribution: $c_3 = (Y_1 - c_1 - c_2)(1 + M)$. In period 2, the individual takes c_1 as given and maximizes

$$\max_{c_2} \; u(c_2) + \beta u((Y_1 - c_1 - c_2)(1 + M)) \tag{1}$$

The associated FOC is $u'(c_2) = \beta(1+M)u'((Y_1 - c_1 - c_2)(1+M))$. This choice is anticipated in period 1 such that the individual chooses c_1 to solve the following problem:

$$\max_{c_1} \; u(c_1) + \beta[u(c_2) + u(c_3)] \tag{2}$$

$$\text{s.t.} \quad c_3 = (Y_1 - c_1 - c_2)(1 + M) \tag{3}$$

$$u'(c_2) = \beta(1 + M)u'(c_3) \tag{4}$$

$$c_1, c_2, c_3 \geq 0 \tag{5}$$

Defining $Y_2 \equiv Y_1 - c_1$, the solution is described by the following three equations.

$$u'(c_1) = \beta \left[u'(c_2)\frac{dc_2}{dY_2} + u'(c_3)\frac{dc_3}{dY_2} \right] \tag{6}$$

$$u'(c_2) = \beta(1 + M)u'(c_3) \tag{7}$$

$$c_3 = (Y_2 - c_2)(1 + M) \tag{8}$$

From (8), we have

$$\frac{dc_3}{dY_2} = \left(1 - \frac{dc_2}{dY_2}\right)(1 + M) \tag{9}$$

Combining these equations yields a version of the familiar modified Euler equation (Harris

and Laibson 2001):[40]

$$\Rightarrow u'(c_1) = \left[\beta \frac{dc_2}{dY_2} + \left(1 - \frac{dc_2}{dY_2}\right)\right] u'(c_2) \tag{10}$$

In the absence of commitment, a decrease in β has three effects on savings until period 3. First, for given resources in period 2, the individual will consume a higher fraction of the available income in period 2, such that c_2 increases relative to c_3. Second, from the perspective of the period 1 self, this lowers the marginal utility of savings as the allocation of consumption between periods 2 and 3 is not maximizing utility as perceived in period 1. In the modified Euler equation, $\frac{dc_2}{dY_2}$ increases. Since Period 1 self anticipates this, this reduces savings in Period 1. Third, the Period 1 self also has a stronger present bias (lower β), which will further reduce savings.

Commitment savings. Consider now the situation in which a commitment savings account is available. That is, any money that is saved in Period 1 cannot be withdrawn until Period 3. Period 1 self would like to set $u'(c_2) = (1+M)u'(c_3)$. However, in the absence of commitment savings, Period 2 self deviates from this, i.e. chooses c_2 such that $u'(c_2) = \beta(1 + M)u'(c_3)$ and, hence, consumes more than Period 1 would like him to. This creates a demand for commitment for Period 1 self. Since the Period 1 self is always (weakly) more patient than the Period 2 self, this implies that the solution to this problem is simply the case in which the Period 1 self determines consumption in all three periods. Hence, the individual will consume c_1 and put c_3 into the commitment savings account such that $u'(c_1) = \beta u'(c_2) = \beta(1 + M)u'(c_3)$, subject to the above budget constraint. Hence, the solution is described by the following equations:

$$u'(c_1) = \beta u'(c_2) \tag{11}$$

$$u'(c_2) = (1 + M)u'(c_3) \tag{12}$$

$$c_3 = (Y_2 - c_2)(1 + M) \tag{13}$$

Comparing these two solutions allows us to better understand relationship between present bias and commitment savings. First, introducing a commitment savings option increases savings iff $0 < \beta < 1$. This is because the commitment savings device makes both the Period 1 and 2 selves consume a smaller share of their available resources Y_1 and Y_2, respectively. If $\beta = 1$, commitment savings has no effect since there is no discrepancy between the Period 1

[40]Note that in contrast to Harris and Laibson (2001), there is no interest rate in this equation since M is a matching contribution rather than an interest rate.

and Period 2 preferences. Hence, the impact of commitment savings on savings is zero. At the other extreme, if $\beta \to 0$, there are no savings even if commitment is available. Hence, there is no impact of the commitment device on savings choices either.[41] Taken together, this implies that the impact of commitment savings is non-monotonic in present bias.

Second, for $\beta \in (0, 1)$, changing β has two opposing effects on the impact of commitment on savings. The first effect is that, in the absence of commitment, the Period 2 self will deviate more from the allocation that maximizes Period 1 self's utility (by increasing c_2 relative to c_3). This not only reduces Period 2 self's savings for given resources, but it also reduces Period 1 self's saving as he anticipates this effect. In contrast, in the presence of the commitment device, the Period 1 self can prevent this from happening by saving the desired amount using the commitment device. Hence, impact of the commitment device on savings is larger for increased present bias due to this effect. However, there is a second, opposing effect. Since Period 1 self's β also decreases, the desire to allocate resources to Periods 2 and 3 falls even if a commitment savings option is available. This lowers the impact of offering the commitment savings option. In the extreme case for $\beta \to 0$, there is no effect.

5.2 Solving for the Isoelastic Case

This section will now consider the case of the commonly used isoelastic utility function.

$$u(c_t) = \begin{cases} \frac{c_t^{1-\gamma}}{1-\gamma} & \text{if } \gamma \neq 1, \\ \log(c_t) & \text{if } \gamma = 1. \end{cases} \tag{14}$$

No commitment savings. Equations (7) and (10) become

$$c_2^{-\gamma} = \beta(1+M)c_3^{-\gamma} \tag{15}$$

$$c_1^{-\gamma} = \left[\beta\frac{dc_2}{dY_2} + \left(1 - \frac{dc_2}{dY_2}\right)\right] c_2^{-\gamma} \tag{16}$$

Using (8) and (15), we can solve for c_3 and c_2 as functions of Y_2:

$$c_3 = \left(\frac{1+M}{1+\theta}\right) Y_2 \quad \text{and} \quad c_2 = \left(\frac{\theta}{1+\theta}\right) Y_2. \tag{17}$$

[41] Subsistence levels in consumption could change this in the absence of income sources in Periods 2 and 3.

where $\theta \equiv (\beta(1+M))^{\frac{-1}{\gamma}}(1+M)$. This implies $\frac{dc_2}{Y_2} = \frac{\theta}{1+\theta}$ and, using (16), we get

$$c_1 = \left(\frac{1+\beta\theta}{1+\theta}\right)^{\frac{-1}{\gamma}} c_2. \tag{18}$$

Using the budget constraint and rewriting (15) to $c_2 = \frac{\theta}{1+M} c_3$, this yields

$$c_3^{\mathrm{NC}} = \frac{Y(1+M)}{1+\theta+\theta\left[\frac{1+\beta\theta}{1+\theta}\right]^{\frac{-1}{\gamma}}}. \tag{19}$$

Commitment savings. Equations (11) and (12) become

$$c_2 = (1+M)^{\frac{-1}{\gamma}} c_3, \tag{20}$$

$$c_1 = \beta^{\frac{-1}{\gamma}} c_2 = \left(\frac{\theta}{1+M}\right) c_3. \tag{21}$$

Using the budget constraint (13), this implies

$$c_3^{\mathrm{C}} = \frac{Y(1+M)}{1+\theta+(1+M)^{1-\frac{1}{\gamma}}}. \tag{22}$$

Comparing savings with and without commitment savings. Comparing the two solutions yields

$$\Delta \equiv c_3^{\mathrm{C}} - c_3^{\mathrm{NC}} = \frac{Y(1+M)}{1+\theta+\theta\left[\frac{1+\beta\theta}{1+\theta}\right]^{\frac{-1}{\gamma}}} - \frac{Y(1+M)}{1+\theta+(1+M)^{1-\frac{1}{\gamma}}}. \tag{23}$$

Figure 9 depicts Δ as a function of β for different values of γ. For the empirically relevant ranges of $\beta \in [0.5, 1]$ and $\gamma > 0.5$, a decrease in present bias, i.e. an increase in β, lowers the impact of commitment savings devices on savings.[42] This implies that an increase in sobriety (which lowers the use of commitment savings in my experiment) is effectively equivalent to an increase in β.

5.3 Relationship between Sobriety and Commitment Savings

In my study, increasing sobriety and commitment savings are substitutes in terms of their impact on savings as shown in the upper panel of Figure 10. This figure shows cumulative savings by sobriety treatment and the cross-randomized savings conditions. In the upper

[42] See, for instance, Frederick et al. (2002) for a review of estimates of present bias, and Chetty (2006) for estimates of γ.

panel, individuals are divided into four groups according to whether they were offered sobriety incentives—pooling the Incentive and Choice Groups—and whether their savings option included the cross-randomized Commitment Savings feature.[43] Cumulative savings for the four groups are nearly identical through the pre-incentive period until day 4. In contrast, represented by the green line with solid circles, the group that received neither commitment savings nor the alcohol treatment saved much less than each of the remaining groups subsequently. That is, while both incentives for sobriety and the commitment savings option have a large impact on savings, being assigned to both does not further increase savings.

These differences across treatment groups are due to differences in both deposits and withdrawals. Compared to the group without either incentives for sobriety or commitment savings, sobriety incentives and commitment savings each on their own increased deposits (upper panel of Figure 11). They also both reduced withdrawals (lower panel of Figure 11.). The magnitudes of these effects vary slightly. The effect of sobriety incentives on deposits is somewhat larger than the effect of commitment savings, but this difference is offset by an equivalent difference in withdrawals resulting in nearly identical overall savings.

As discussed in the previous subsections, these results suggest that increasing sobriety reduced self-control problems. An alternative interpretation could be that alcohol is a key temptation good for this population such that if alcohol consumption is reduced, the need for commitment savings is substantially reduced (while self-control may be unaffected). However, given that the intervention only moderately reduced overall alcohol consumption and expenditures, this channel is unlikely.

Another potential concern with interpreting the negative interaction effect between sobriety incentives and commitment savings as evidence of increased self-control is that there could be ceiling effects, i.e. there could be an upper bound of how much individuals are able to or want save. However, average daily savings are well below the savings limit of Rs. 200 per day. Moreover, in the course of the study, all individuals received relatively large study payments. These were in addition to their earnings that appear to have been largely unaffected by the study. Hence, the majority of individuals should have been able to increase their savings if they preferred to do so. In addition, increasing the matching contribution rate does *not* serve as a complement to increased sobriety, i.e. the effects of incentives for sobriety and a high matching contribution appear to have been additive (lower panel of Figure 10). This demonstrates that individuals were able and willing to save more when incentives were well aligned.

[43]For instance, the blue line with squares shows cumulative savings for individuals who were no offered incentives for sobriety, but who were given the commitment savings options.

6 Do individuals want to reduce their drinking?

Given the above short-term costs and other longer-run costs of alcohol consumption, a natural question to ask is whether individuals are aware of these effects. Moreover, if individuals are aware, why are they not reducing their consumption? To address this question, this section considers the extent to which self-control problems contribute to individuals' demand for receiving incentives for sobriety. As described in Section 3, after receiving incentives for three days, individuals in the Choice Group were asked to choose between incentives to arrive sober and different amounts of unconditional payments. Individuals in the Choice Group first made these choices at the beginning of Phase 3 (day 7), and then again at the beginning of Phase 4 (day 13). Finally, regardless of experimental condition, all study participants were given the same choices at the end of Phase 4 (day 20). This structure allows me to investigate whether individuals in the Choice Group change their choices over time, and whether receiving incentives in earlier phases of the study affects individuals' demand for commitment. During each choice session, individuals choose their incentive structure for the subsequent six study days.

The fraction of individuals who chose incentives was high, even when choosing incentives entailed a potential (Choice 2) or certain (Choice 3) reduction in overall study payments (upper panel of Figure 12 and Table 3). More than one third of individuals in the Choice Group preferred sobriety incentives over receiving Rs. 150 regardless of their breathalyzer scores, and in each week, over 50 percent of individuals chose incentives over receiving Rs. 120 unconditionally. Holding attendance constant, this choice implied losses of Rs. 30 ($0.50) in study payments at the minimum (on days when the individual visits the study office sober) and Rs. 90 ($1.50) at the maximum (on days when the individual visits the study with a positive breathalyzer score). These amounts are economically meaningful, representing between 10 and 30 percent of reported daily labor earnings. Moreover, the fraction of individuals choosing sobriety incentives over Rs. 150 unconditionally did not decline over time. Instead, though not statistically significant, it in fact increased slightly in the course of the study.

Subjects' choices in my study provide clear evidence of self-control problems. In particular, the fraction of individuals who exhibited costly demand for commitment was larger than found previously for smoking (Gine et al. 2010) or exercising (Royer et al. 2014). While a growing literature has demonstrated demand for commitment in a number of domains,[44]

[44]For instance, Ashraf, Karlan, and Yin (2006) and Beshears et al. (2011) on commitment savings; Gine et al. (2010) on smoking cessation; Kaur et al. (2014) on self-control at the workplace; Ariely and Wertenbroch (2002), Augenblick et al. (2014), and Houser et al. (2010) on effort tasks; and Royer et al. (2014) and Milkman et al. (2014) for gym attendance. For overviews, see Bryan et al. (2010) and Augenblick et al. (2014).

	Option A		Option B	Percent choosing A		
Choice	BAC > 0	BAC = 0	regardless of BAC	Week 1	Week 2	Week 3
(1)	Rs. 60	Rs. 120	Rs. 90	68	70	65
(2)	Rs. 60	Rs. 120	Rs. 120	53	58	50
(3)	Rs. 60	Rs. 120	Rs. 150	**35**	**38**	**45**

Table 3: Summary of choices in Choice Group over time

there is little existing evidence that people are willing to pay for commitment beyond the potential costs of failing to achieve the behavior they are committing to.[45]

Exposure to incentives for sobriety increased the demand for these incentives (lower panel of Figure 12). For all three unconditional payments, the Incentive Groups was more likely to choose incentives than the Control Group. The fraction of individuals choosing incentives in the Choice Groups (on day 20) lies in between the Incentive and Control Groups'. The corresponding regressions show significant differences between the fraction choosing incentives in the Incentive and Control Groups for all three choices (Table 12). These differences are not explained by differences in sobriety while making these choices, or by changes in expectations of sobriety under incentives. Notably, increased sobriety during the time of choosing increases the likelihood of choosing incentives.

Table 12 investigates how past and future sobriety are related to demand for incentives. Before preferences were elicited, individuals were asked how often they would expect to show up sober if they received incentives. Reassuringly, subjects' beliefs about their expected sobriety under incentives strongly predicts demand for incentives. Moreover, Table 12 shows the relationship between the number of sober days in each phase of the study and demand for incentives. Individuals who visited the study office sober more often in the incentivized Phase 2 were subsequently more likely to choose incentives for all three unconditional amounts. This is not surprising since expected study payments from choosing incentives are higher if a study participant is more likely to visit the study office sober. In contrast, the difference in sobriety between Phase 2 (when some individuals were receiving incentives) and Phase 1 (the pre-incentive period) positively predicts demand *only* for costly incentives (i.e. when the unconditional payment is Rs. 150). This is reassuring since individuals should have chose costly incentives only when they expected them to help increase their sobriety which in turn should have been informed by their own experience in the study.

[45]Notable exceptions are Beshears et al. (2011) and Milkman et al. (2014).

7 Conclusion

This paper provides evidence that self-control problems may not only cause undesired alcohol consumption, but alcohol itself exacerbates present bias and, hence, further self-control problems. In the context of my experiment, I find that increasing sobriety during the day causes a stark increase in individuals' savings at the study office. In addition, I provide evidence that this increase is due to lowered self-control problems in savings decisions. Moreover, I show that a significant fraction of cycle-rickshaw peddlers in a large Indian city are willing to pay for commitment to increase sobriety during the day, indicating self-control problems. Taken together, these results imply that effective commitment devices for sobriety not only help individuals reduce undesired alcohol consumption, but also lessen self-control problems caused by alcohol.

This evidence suggests that "sin taxes" (O'Donoghue and Rabin 2006) or even prohibition could be attractive policy options. However, enforcement of prohibition is known to be difficult and may result in other unintended consequences (Thornton 1991). Moreover, the relatively low price elasticity of the demand for alcohol, both in this setting and in general (Wagenaar et al. 2009), suggests that sin taxes are likely to be regressive. This makes these policy options less desirable, even if reduced self-control problems due to increased sobriety alter the cost-benefit calculation. Hence, reducing the direct costs of inebriation via interventions that shift drinking patterns away from critical decision times may be a second-best option.

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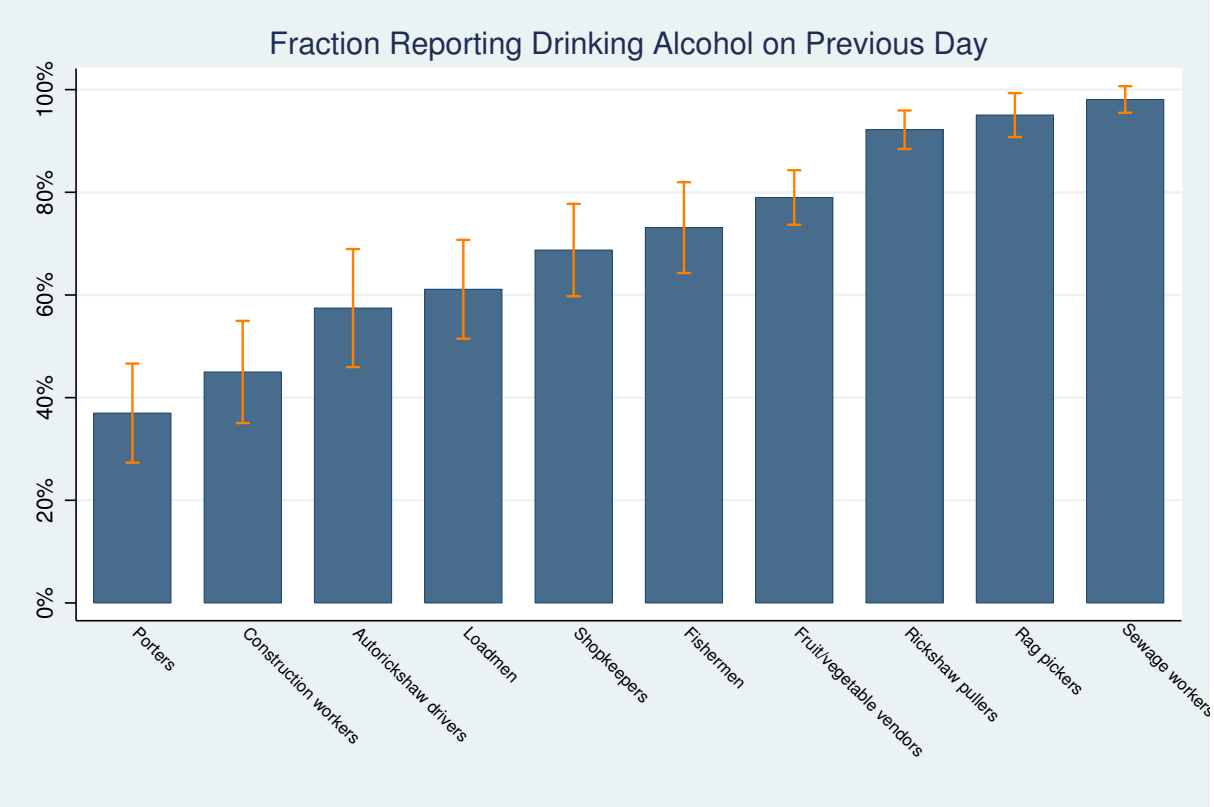
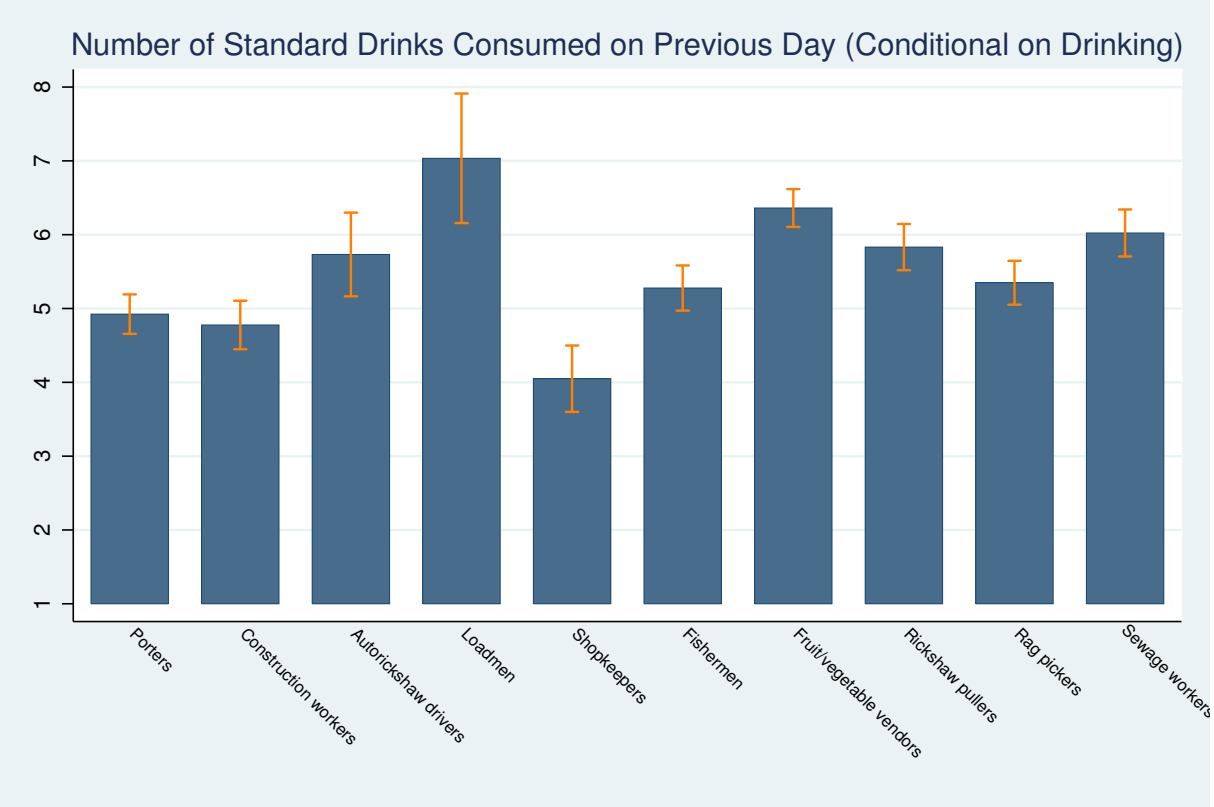
A Figures

Figure 1: Prevalence of Alcohol Consumption among Low-Income Males in Chennai



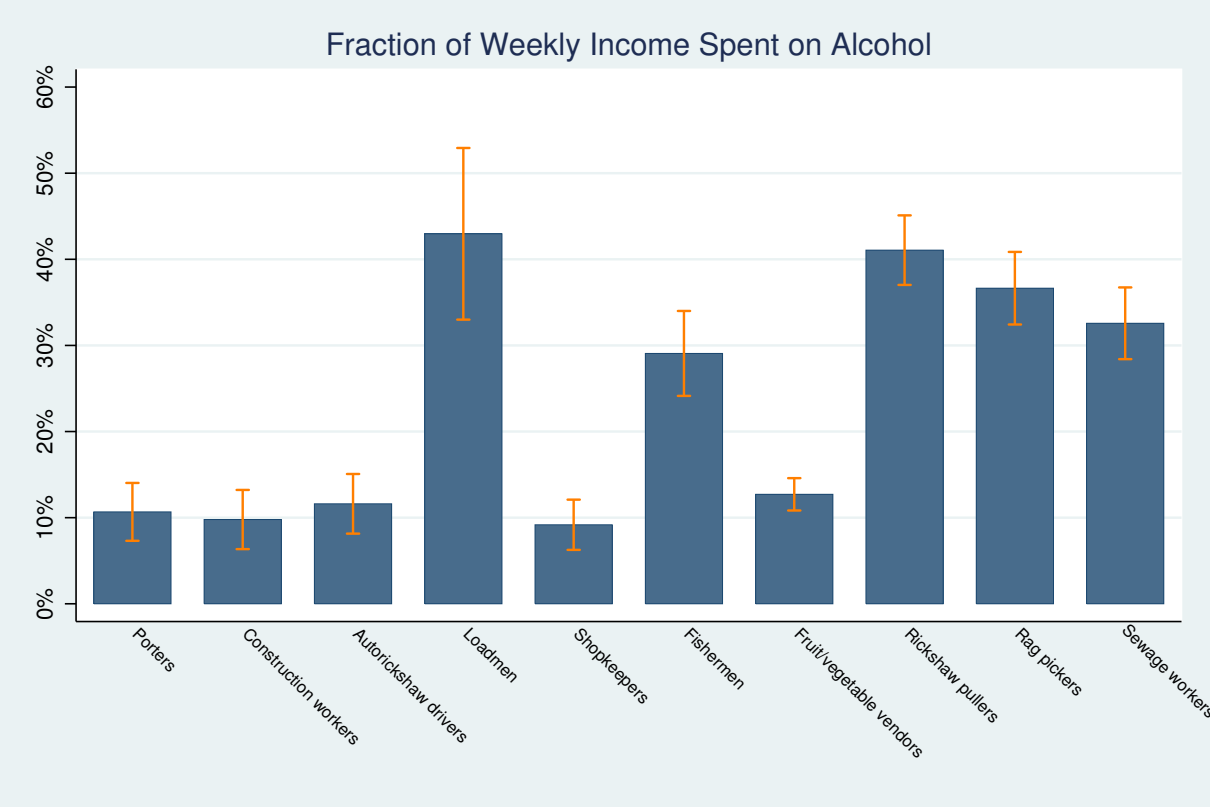
Notes: This figure depicts the prevalence of alcohol consumption among males in ten different low-income professions in Chennai, India, as measured by the fraction of individuals who reported consuming alcohol on the previous day. The underlying data from these figures are from a short survey conducted with a total sample size of 1,227 individuals. The number of individuals surveyed in each profession varies from 75 (auto rickshaw drivers) to 230 (fruit and vegetable vendors). Error bars show 95 percent confidence intervals.

Figure 2: Fraction of Weekly Income Spent on Alcohol



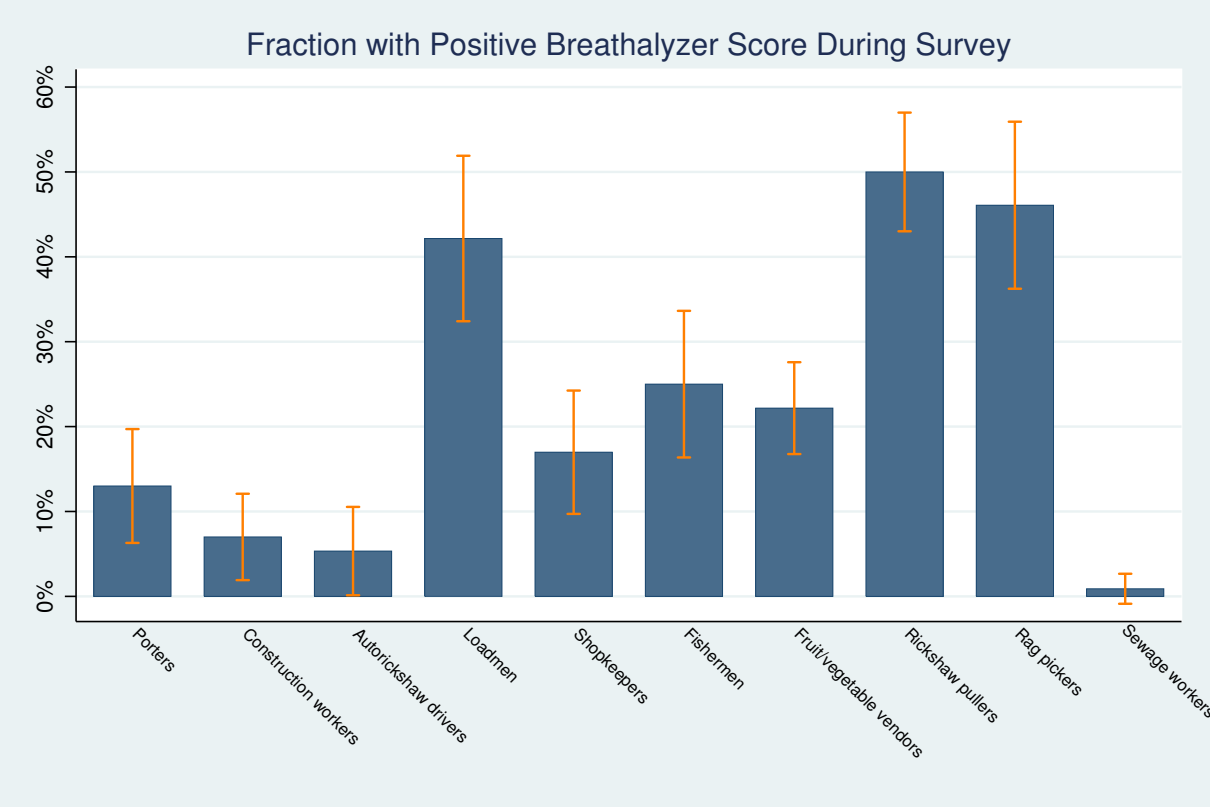
Notes: This figure shows the number of standard drinks consumed on the previous day, conditional on reporting any alcohol consumption on the previous day as described in Figure 1. Reported consumption levels are converted into standard drinks according to WHO (2001). A small bottle of beer (330 ml at 5% alcohol), a glass of wine (140 ml at 12% alcohol), or a shot of hard liquor (40 ml at 40% alcohol) each contain about one standard drink. Error bars measure 95 percent confidence intervals.

Figure 3: Prevalence of Alcohol Consumption among Low-Income Males in Chennai



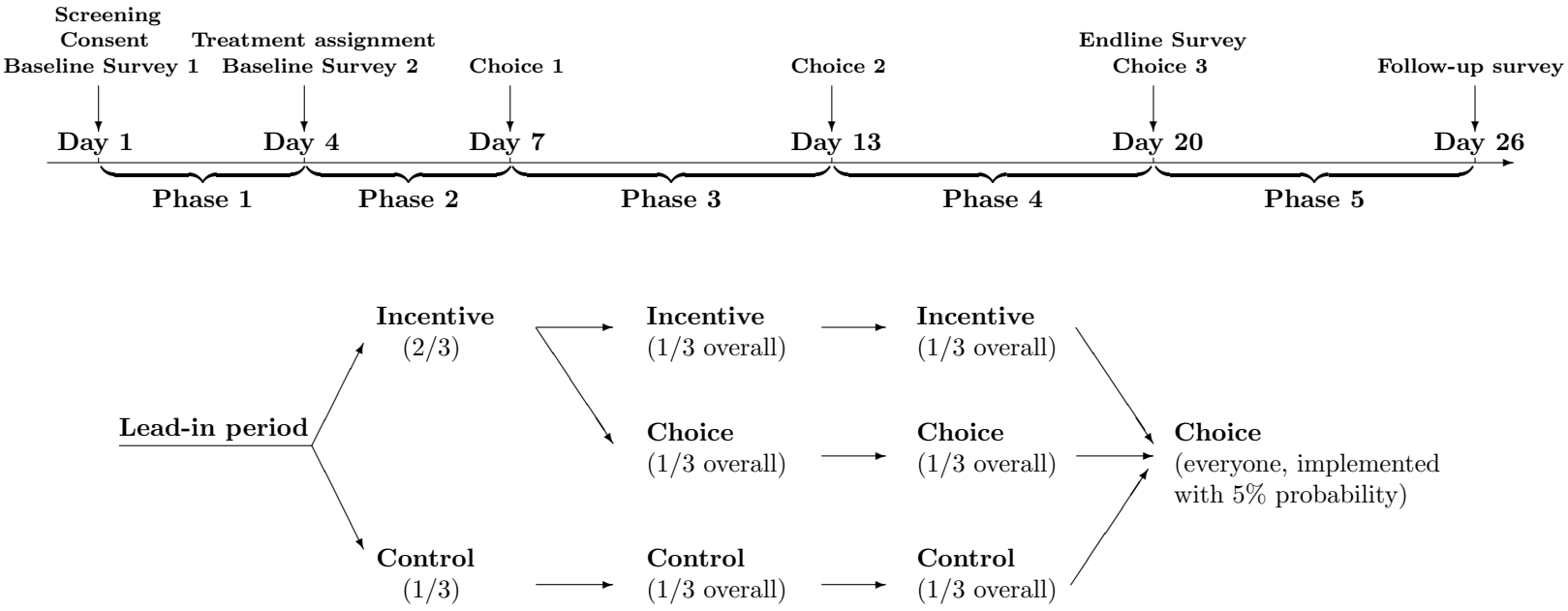
Notes: This figure shows the fraction of weekly income spent on alcohol for ten profession groups in Chennai. For each individual, the fraction spent on alcohol is calculated by dividing reported weekly alcohol expenditures by reported weekly earnings. Weekly alcohol expenditures are calculated by multiplying the number of days the individual reported consuming alcohol in the previous week times the amount spent on alcohol per drinking day. Weekly earnings are calculated by the number of days worked during the previous week times the amount earned per working day. Error bars measure 95 percent confidence intervals.

Figure 4: Fraction with Positive Breathalyzer Score



Notes: This figure shows the fraction of individuals who were inebriated during the time of the survey, as measured by having a positive blood-alcohol content in a breathalyzer test (BAC > 0). All surveys were conducted during the day, i.e. between 8 am and 6 pm. Error bars measure 95 percent confidence intervals.

Figure 5: Experimental Design



Notes: This figure gives an overview on the experimental design and the timeline of the study.

1. On day 1, individuals responded to a screening survey. Interested individuals then gave informed consent upon learning more about the study. Regardless of the consent decision regarding participation decision in the full study, all individuals were asked to complete a baseline survey (for which a separate consent was elicited).

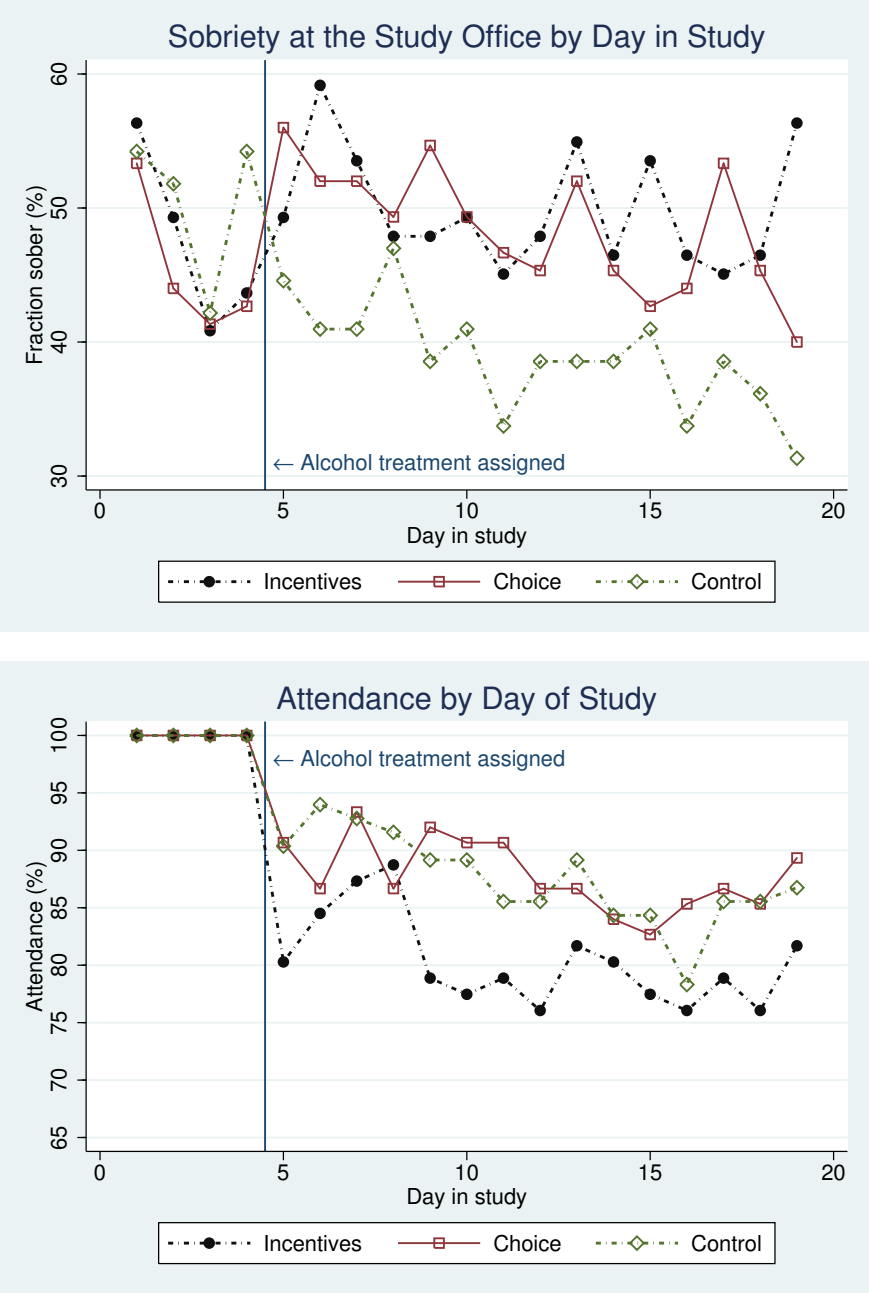
2. On day 4, individuals who passed the lead-in period (Phase 1) completed a second baseline survey, and were then informed of their treatment status. On this day, individuals were fully informed about their payment structure and the decisions to be made over the course of the study.

3. The payments for the three treatment groups were as follows. (i) The Control Group was given the same unconditional payments as in Phase 1 (Rs. 90 regardless of breathalyzer score). (ii) Study payments for the Incentive Group depended on the breathalyzer score starting with day 5 of the study (Rs. 60 if BAC > 0, Rs. 120 if BAC $= 0$). (iii) After facing the same payment schedule in Phase 2 as the Incentive Group, the Choice Group was asked to choose whether they wanted to continue receiving these incentives, or whether they preferred payments that did not depend on their breathalyzer scores. These choices were made on days 7 and 13, each for the subsequent week.

4. On day 20, all individuals were asked to conduct an endline survey. No incentives for sobriety were given on this day. *All* individuals were then given the same choices between conditional and unconditional payments as individuals in the Choice Group on days 7 and 13. To ensure incentive compatibility, these choices were then implemented for a small subset (5 percent) of study participants.

5. One week after their last day in the study, individuals were visited for a follow-up survey including a breathalyzer test.

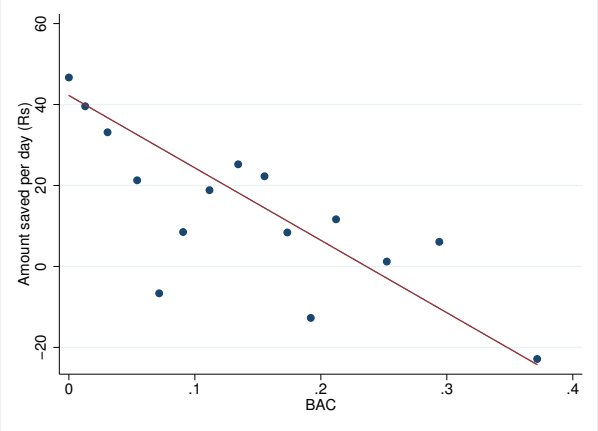
Figure 6: Sobriety and Attendance by Alcohol Incentive Treatment Group



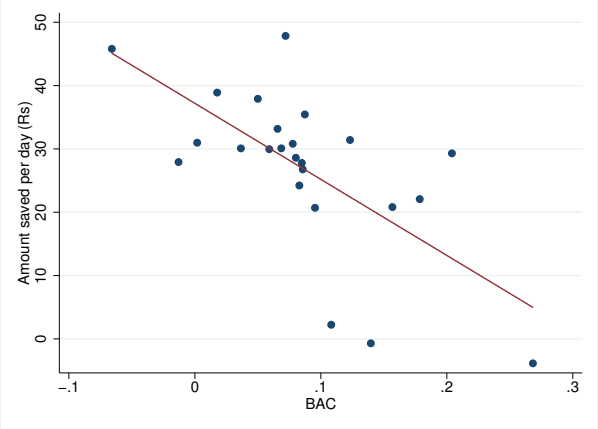
Notes: The upper panel of this figure shows the fraction of individuals who visited the study office sober over the course of the study for each of the three incentive treatment groups. The indicator variable 'sober at the study office' takes on the value '1' for a study participant on any given day of the study if he (i) visited the study office on this day, *and* (ii) his breathalyzer test was (exactly) zero. The variables is, hence, '0' for individuals with a positive breathalyzer or who didn't visit the study office on this day. The lower panel of the figure shows the fraction of individuals who visited the study office for the three incentive treatment groups. Since only individuals who came to the study office on days days 2 through 4 were fully enrolled in the study, by construction, attendance is 100 percent on days 1 through 4.

Figure 7: Cross-sectional Relationship between Daily Amounts Saved and BAC

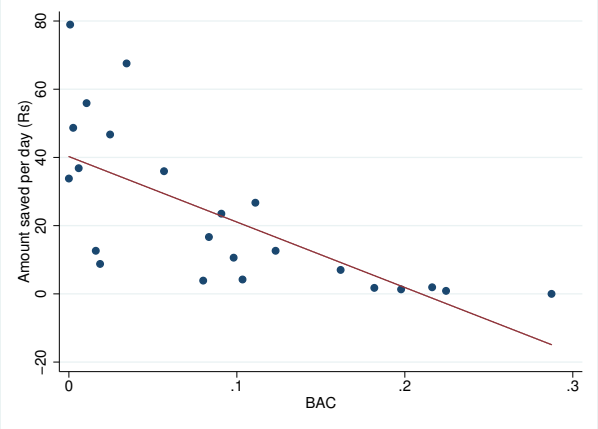
(a) Daily amount saved and BAC (no individual FE)



(b) Daily amount saved and BAC (individual FE)

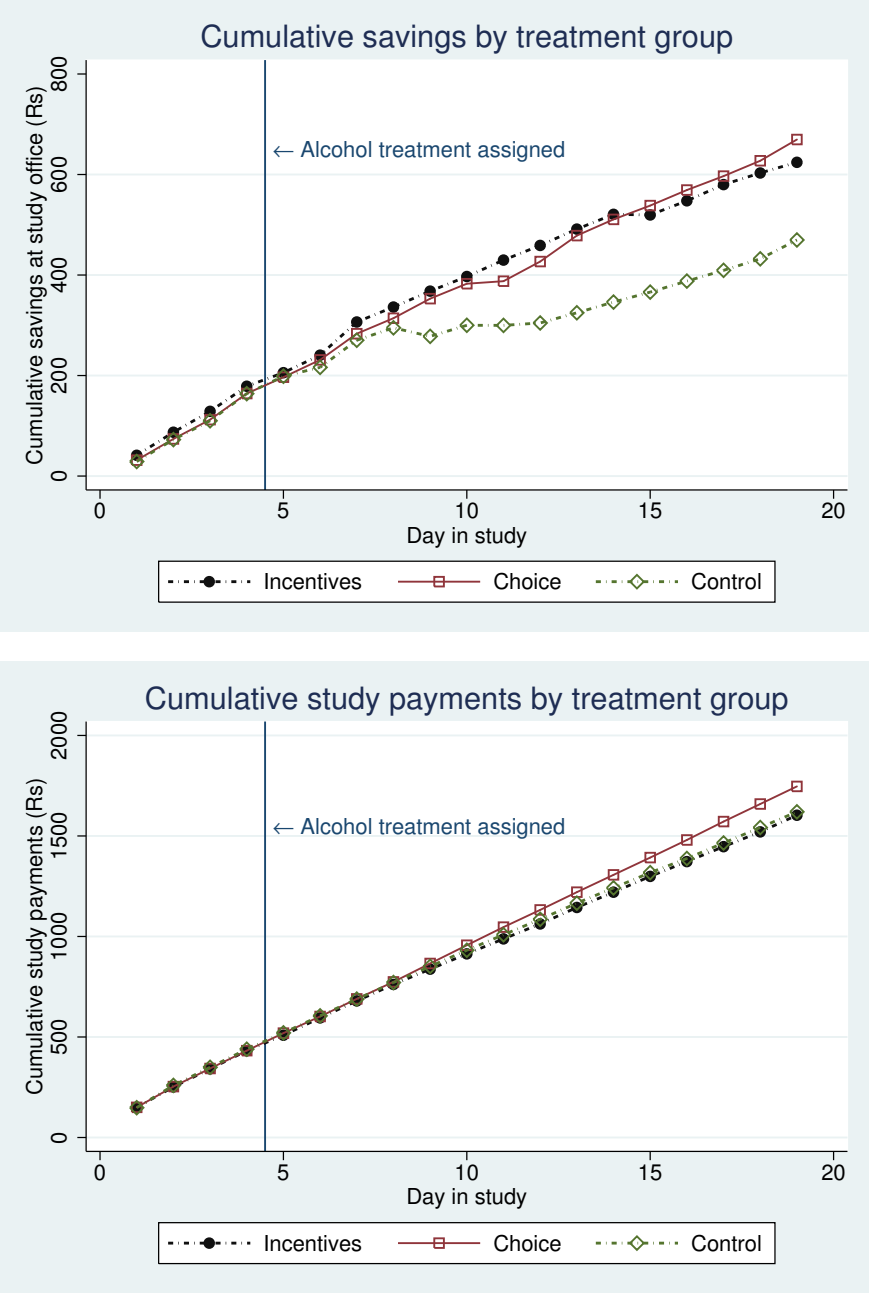


(c) Mean amount saved and mean BAC



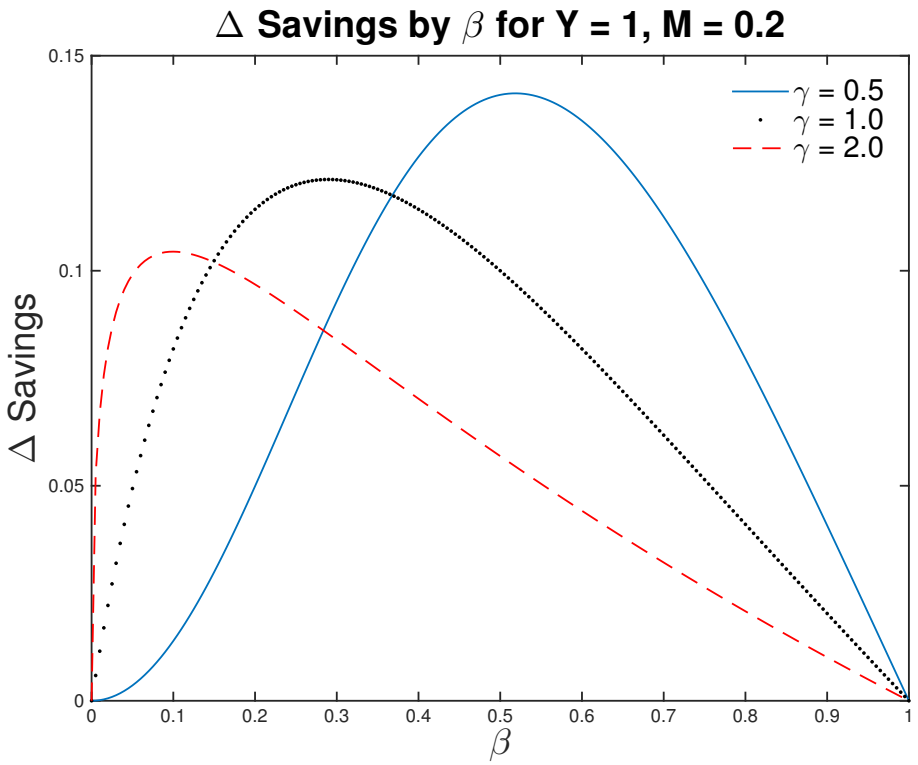
Notes: This figure shows the correlation between breathalyzer scores during study office visits and amounts saved at the study during the same visits for individuals in the Control Group individuals. The top panel depicts a binned scatter plot (including regression line) for all observations. The center panel shows the same graph controlling for individual fixed effects. The bottom panel depicts the correlation across study participants by collapsing observations by individual.

Figure 8: Cumulative Sayings by Day of Study



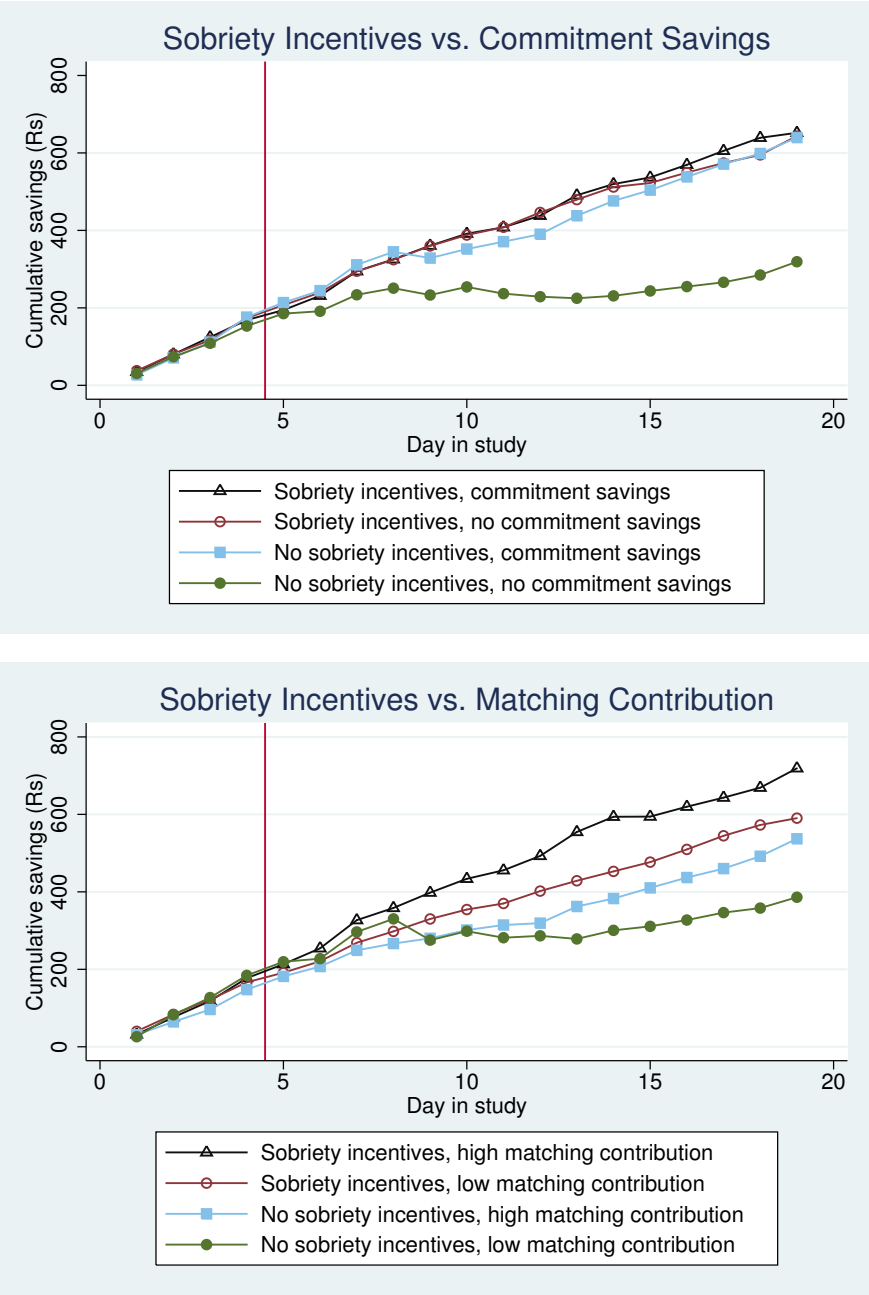
Notes: This figure depicts subjects' cumulative study payments and cumulative savings at the study office by alcohol incentive treatment group. The upper panel shows cumulative amounts saved by alcohol incentive treatment in the course of the study. The lower panel shows the corresponding cumulative study payments.

Figure 9: Effect of Commitment Savings as Function of β



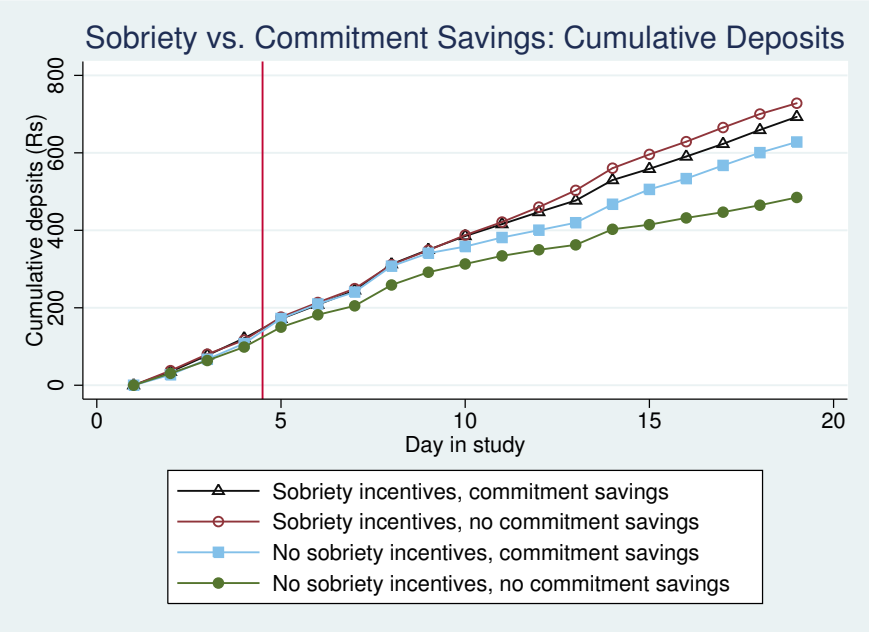
Notes: This figure shows the relationship between present bias and the effect of commitment savings in the model described in Sections 5.1 and 5.2. The figure shows the present bias (as measured by $\beta \in [0, 1]$) on the horizontal axis and the increase in savings due to offering a commitment savings option on the vertical axis for the isoelastic utility case. This increase in savings is given by the difference in consumption in period 3 between the two cases described in my model, i.e. $\Delta = c_3^{\text{C}} - c_3^{\text{NC}}$ as shown in equation (23). The figure depicts the relationship between Δ and β for $\gamma = 0.5$ (the solid line), $\gamma = 1$ (the dotted line), and $\gamma = 2$ (dashed line). In the specific figure shown here, $Y = 1$ and $M = 0.2$. The relationship is very similar, if not identical, for different parameter values. An explicit solution for Δ in the log case ($\gamma = 1$) is given in the Supplementary Appendix below.

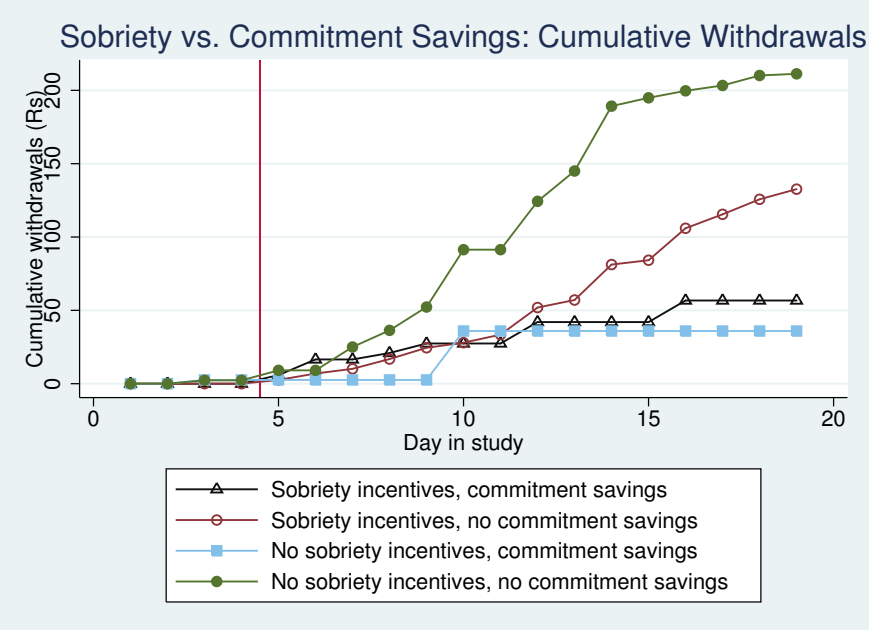
Figure 10: Interaction between Sobriety Incentives and Savings Treatments



Notes: This figure shows the interaction between the cross-randomized sobriety incentives and savings treatments. The upper panel shows cumulative savings for four different groups: individuals who were offered (i) neither sobriety incentives nor commitment savings (green line with solid circles), (ii) no sobriety incentives, but commitment savings (blue line with squares), (iii) sobriety incentives, but not commitment savings (red line with hollow circles), and (iv) both sobriety incentives and commitment savings (black line with triangles). The lower panel of the figure shows the equivalent graph for the interaction between receiving sobriety incentives and a matching contribution (20 percent instead of 10 percent on the amount saved by day 20).

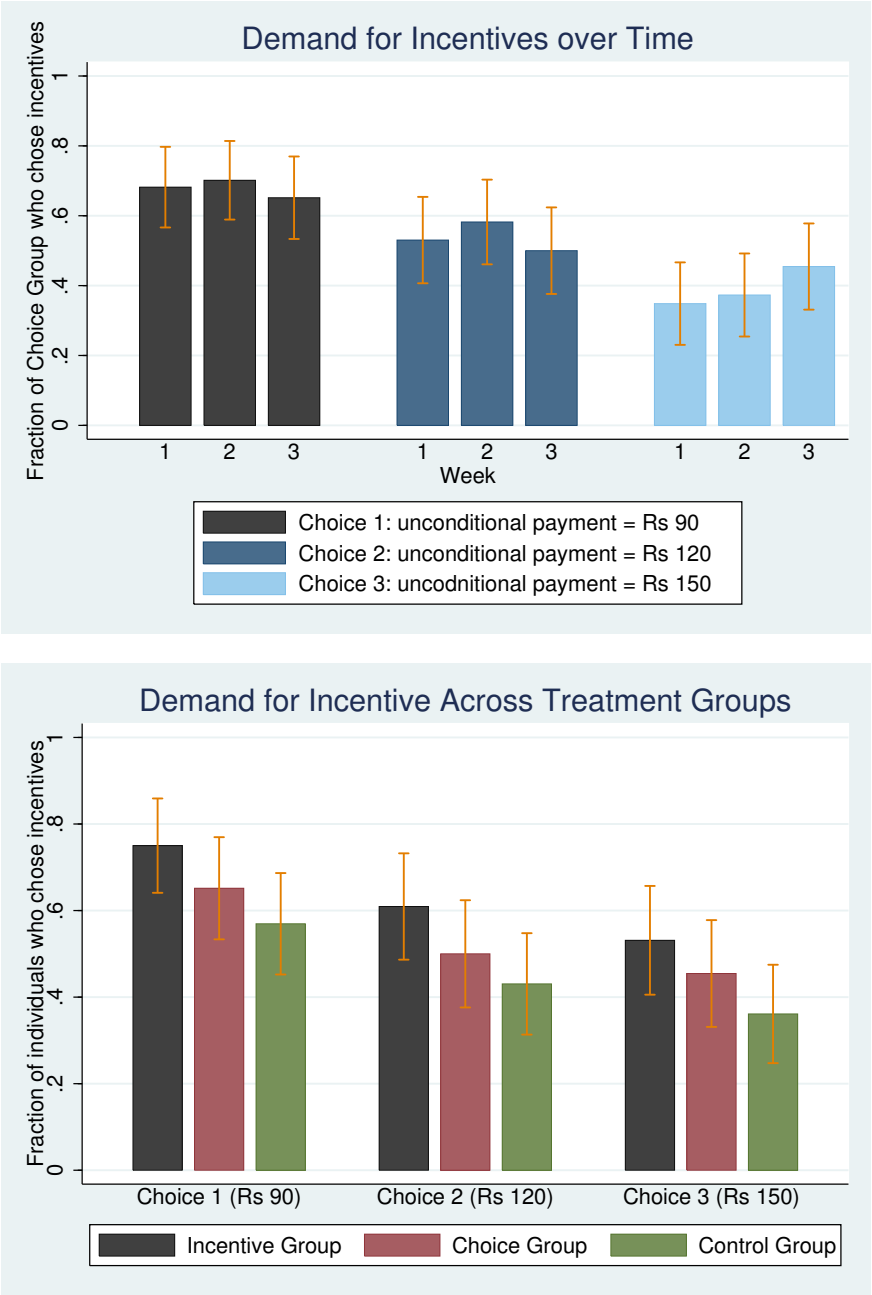
Figure 11: Sobriety Incentives vs. Commitment Savings: Deposits and Withdrawals





Notes: This figure shows splits up the results shown in the upper panel of Figure 8 into cumulative deposits (upper panel) and cumulative withdrawals (lower panel).

Figure 12: Choices Across Treatment Groups and Over Time



Notes: This figure depicts the fraction of individuals who chose incentives for sobriety over unconditional payments that do not depend on sobriety. All choices are made for the subsequent week, i.e. for the next six days in the study. Under incentives for sobriety, if an individual visits the study offices, he receives Rs. 60 ($\approx$ \$1) if his breathalyzer score is positive, and Rs. 120 if his breathalyzer score is zero. Unconditional payments are Rs. 90 (choice 1), Rs. 120 (choice 2), and Rs. 150 (choice 3). Hence, and individual exhibits demand for commitment to sobriety if he chooses incentives in Choices 2 and/or 3. At any point in time, individuals make all three choices. One of these choices is randomly selected to be implemented. The upper panel of the figure shows how the fraction of individuals in the Choice Group who chose incentives evolved over time (i.e. on days 7, 13, and 20 of the study). The lower panel of the figure depicts the fraction of individuals who chose incentives on day 20 in the three treatment groups, i.e. it shows how previous exposure to incentives affected the demand for incentives. Error bars show 95 percent confidence intervals.

B Tables

Table 4: Eligibility Status at Different Recruitment Stages

STAGE	FRACTION
(1) Field Screening Survey	
Eligible and willing to participate	**64%**
Not willing to conduct survey	14%
Drinks too little to be eligible	11%
Drinks too much to be eligible	1%
Ineligible for other reasons	3%
Eligible, but not interested	7%
(2) Office Screening Survey	
Eligible in Office Screening	**83%**
Ineligible for medical reasons	13%
Ineligible for other reasons	4%
(3) Lead-in Period	
Proceeded to enrollment	**66%**
Didn't proceed and BAC $= 0$ on day 1	19%
Didn't proceed and BAC > 0 on day 1	15%

Notes: This table gives an overview on the three-stage screening process of the study.

1. For each stage, it shows the fraction of individuals who were eligible and willing to proceed to the next stage of the study, the reasons for individuals not to proceed, and the relative frequencies of these reasons (each conditional on reaching the respective stage).
2. The tiers of the selection process are (1) the field screening survey (top panel), (2) the office screening survey (center panel), and (3) the lead-in period (bottom panel).

Table 5: Summary of Estimated Effect of Incentives on Alcohol Consumption

	Before/during visits			Overall drinking		
	Control	Change	%	Control	Change	%
Breathalyzer scores						
Fraction sober/abstinent	0.39	$+0.13^{***}$	+33.3	0.10	+0.02	+19.0
BAC (%)	0.09	-0.03^{***}	–33.3	–	–	–
Self reports						
# standard drinks	2.96	-0.98^{***}	–33.1	5.65	−0.28	–5.0
Expenditures (Rs/day)	–	–	–	91.2	-8.7^{*}	–9.5

Notes: This table gives an overview on the estimated treatment effects on sobriety before/during the study office visit (left panel) and overall alcohol consumption (right panel).

1. The table includes control means, estimated coefficients, both in absolute terms and as a share of the respective control mean.
2. The coefficients shown are from pooled estimates (i.e. pooling the Incentive and Choice Group) from Table 6 (left panel) and Table 7 (right panel), including Phase 1 and baseline survey controls.
3. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.

Table 6: The Effect of Incentives on Sobriety Before and During Study Office Visit

VARIABLES	(1) Sober	(2) Sober	(3) Sober	(4) Sober	(5) BAC	(6) BAC	(7) BAC	(8) BAC	(9) # Drinks	(10) # Drinks	(11) # Drinks	(12) # Drinks
Incentives	0.11*	0.13***	0.13***		-0.04***	-0.04***	-0.04***		-1.09***	-1.22***	-1.14***	
	(0.058)	(0.047)	(0.044)		(0.013)	(0.010)	(0.010)		(0.372)	(0.279)	(0.262)	
Choice	0.10*	0.13***	0.13***		-0.01	-0.02*	-0.02*		-0.76**	-0.86***	-0.84***	
	(0.058)	(0.041)	(0.043)		(0.015)	(0.010)	(0.010)		(0.375)	(0.246)	(0.255)	
Pooled alcohol treatment				0.13***				-0.03***				-0.98***
				(0.038)				(0.009)				(0.221)
Observations	3,435	3,435	3,435	3,435	2,932	2,932	2,932	2,932	2,932	2,932	2,932	2,932
R-squared	0.010	0.248	0.294	0.294	0.019	0.299	0.355	0.352	0.022	0.280	0.306	0.305
Baseline survey controls	NO	NO	YES	YES	NO	NO	YES	YES	NO	NO	YES	YES
Phase 1 controls	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Control group mean	0.389	0.389	0.389	0.389	0.0910	0.0910	0.0910	0.0910	2.957	2.957	2.957	2.957

Notes: This table considers the effect of the two sobriety incentives treatments on sobriety before and during study office visits.

1. All regressions use data from day 5 (the first day of sobriety incentives) through day 19 (the last day of sobriety incentives) of the study.
2. The outcome variable in columns 1 through 4, sobriety at the study office, is an indicator variable that is "1" for an individual on a given day if he visited the study office on this day *and* had a zero breathalyzer score on this day, and "0" otherwise. That is, individuals who did not visit the study office on any given day are included in these estimates as "not sober at the study office".
3. Columns 5 through 12 are conditional on visiting the study office. The outcome variable in columns 4 through 6 is individuals' measured blood alcohol content from a breathalyzer test. The outcome variable in columns 7 through 9 is the reported number of drinks *before* visiting the study office on any given day.
4. Standard errors are in parentheses, clustered by individual. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.
5. Phase 1 controls are the fraction of sober days, mean BAC during study office visits, the mean reported number of standard drinks consumed before coming to the study office and overall and reported overall alcohol expenditures (all in Phase 1). Baseline survey controls variables are all baseline survey variables shown in Tables A.1 through A.3.

Table 7: The Effect of Incentives on Overall Alcohol Consumption

VARIABLES	(1) # Drinks	(2) # Drinks	(3) # Drinks	(4) # Drinks	(5) No drink	(6) No drink	(7) No drink	(8) No drink	(9) Rs Exp	(10) Rs Exp	(11) Rs Exp	(12) Rs Exp
Incentives	-0.34	-0.20	-0.32		0.01	0.01	0.02		-10.27**	-8.12*	-8.01	
	(0.288)	(0.252)	(0.246)		(0.028)	(0.028)	(0.031)		(4.883)	(4.752)	(5.237)	
Choice	-0.35	-0.16	-0.25		0.02	0.01	0.02		-10.10**	-6.70	-9.31*	
	(0.344)	(0.261)	(0.269)		(0.029)	(0.028)	(0.030)		(4.986)	(4.274)	(4.747)	
Pooled alcohol treatment				-0.28				0.02				-8.71*
				(0.217)				(0.025)				(4.485)
Observations	2,932	2,932	2,932	2,932	2,932	2,932	2,932	2,932	2,932	2,932	2,932	2,932
R-squared	0.003	0.147	0.181	0.181	0.001	0.025	0.064	0.064	0.012	0.132	0.172	0.172
Baseline survey controls	NO	NO	YES	YES	NO	NO	YES	YES	NO	NO	YES	YES
Phase 1 controls	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Control group mean	5.650	5.650	5.650	5.650	0.105	0.105	0.105	0.105	91.22	91.22	91.22	91.22

Notes: This table shows regressions of measures of overall alcohol consumption on indicator variables for the two sobriety incentive treatments.

1. All regressions use data from day 5 (the first day of sobriety incentives) through day 19 (the last day of sobriety incentives) of the study, conditional on visiting the study office.
2. The outcome variables are the reported overall number of standard drinks consumed per day (columns 1 through 4), abstinence from drinking altogether on a given day (columns 5 through 8), and reported alcohol expenditures (Rs. per day, columns 9 through 12).
3. Standard errors are in parentheses, clustered by individual. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.
4. Phase 1 controls are the fraction of sober days, mean BAC during study office visits, the mean reported number of standard drinks consumed before coming to the study office and overall and reported overall alcohol expenditures (all in Phase 1). Baseline survey controls variables are all baseline survey variables shown in Tables A.1 through A.3.

Table 8: The Effect of Incentives on Attendance

VARIABLES	(1) Present	(2) Present	(3) Present	(4) Present	(5) Present
Incentives	-0.07*	-0.07*	-0.08	-0.08*	-0.06
	(0.043)	(0.043)	(0.053)	(0.042)	(0.069)
Choice	0.00	0.00	-0.05	0.00	0.04
	(0.036)	(0.035)	(0.049)	(0.035)	(0.055)
Fraction of sober days in phase 1		-0.04	-0.08		
		(0.040)	(0.064)		
Incentives X Fraction sober in Phase 1			0.02		
			(0.105)		
Choice X Fraction sober in Phase 1			0.12		
			(0.084)		
Amount saved in Phase 1 (divided by 100)				0.02***	0.04***
				(0.009)	(0.012)
Incentives X Amount saved in Phase 1					-0.01
					(0.025)
Choice X Amount saved in Phase 1					-0.02
					(0.014)
Observations	3,435	3,435	3,435	3,435	3,435
R-squared	0.009	0.011	0.015	0.025	0.027
Baseline survey controls	NO	NO	NO	NO	NO
Phase 1 controls	NO	NO	NO	NO	NO
Control group mean	0.875	0.875	0.875	0.875	0.875

Notes: This table shows regressions of daily attendance tho the study office on indicators for the two sobriety incentive treatments.

1. All regressions use data from day 5 (the first day of sobriety incentives) through day 19 (the last day of sobriety incentives) of the study.
2. The outcome variable is an indicator variables for whether an individual visited the study office on any given study day when he was supposed to.
3. Standard errors are in parentheses, clustered by individual. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.

Table 9: The Effect of Sobriety Incentives on Savings at the Study Office

VARIABLES	(1) Rs/day	(2) Rs/day	(3) Rs/day	(4) Rs/day	(5) Rs/day	(6) Rs/day	(7) Rs/day	(8) Rs/day	(9) Rs/day	(10) Rs/day
Incentives	10.10	9.98	10.28*	14.81**	10.34					
	(7.555)	(6.455)	(6.194)	(7.031)	(6.700)					
Choice	14.71*	16.56***	12.77**	19.21***	13.07**					
	(7.772)	(5.679)	(5.382)	(6.288)	(6.208)					
Pooled alcohol treatment						12.45**	13.44***	11.57**	17.18***	11.77**
						(6.262)	(5.030)	(4.801)	(5.529)	(5.293)
High matching contribution	9.40	9.82**	11.41**	12.67**	11.77**	9.29	9.87**	11.45**	12.68**	11.77**
	(6.534)	(4.849)	(4.613)	(5.051)	(4.958)	(6.532)	(4.855)	(4.608)	(5.045)	(4.955)
Commitment savings	7.74	3.15	3.01	4.84	4.64	7.59	2.92	2.92	4.69	4.55
	(6.516)	(5.004)	(4.788)	(5.353)	(5.283)	(6.539)	(5.063)	(4.816)	(5.369)	(5.300)
Daily study payment (Rs)			0.34***		0.49***			0.34***		0.50***
			(0.050)		(0.125)			(0.050)		(0.123)
Observations	3,435	3,435	3,435	2,932	2,932	3,435	3,435	3,435	2,932	2,932
R-squared	0.007	0.114	0.129	0.123	0.131	0.006	0.113	0.129	0.123	0.131
Baseline survey controls	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES
Phase 1 controls	NO	YES	YES	YES	YES	NO	YES	YES	YES	YES
Control mean	20.42	20.42	20.42	20.42	20.42	20.42	20.42	20.42	20.42	20.42

Notes: This table shows the impact of the two sobriety incentive treatments on participants' daily amount saved at the study office (Rs/day).

1. All regressions use data from day 5 (the first day of sobriety incentives) through day 19 (the last day of sobriety incentives) of the study. The outcome variable is the amount saved at the study office. If an individual did not visit the study office on any given day of the study, the amount saved is set to zero on this day. Similarly, the daily study payment is zero for those observations.

2. Regressions include the dummies "high matching contribution" for individuals who were offered a 20 percent matching contribution on their savings as opposed to 10 percent, and "commitment savings" for individuals who were not allowed to withdraw their saving until the last day of the study.

3. Columns (1) through (5) show regressions for the two sobriety incentive treatments separately. Columns (6) through (10) show pooled regressions for the Incentive and Choice Groups. Columns (1) and (6) are without controls, columns (2) and (7) include baseline survey and Phase 1 controls as in the previous tables. Columns (3) and (8) show the same regressions, but additionally control for study payments. The columns (4), (5), (9), and (10) show regressions conditional on attendance.

4. Standard errors are in parentheses, clustered by individual. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.

Table 10: The Marginal Propensity to Save out of Lottery Earnings

VARIABLES	(1) Rs saved	(2) Rs saved	(3) Rs saved	(4) Rs saved
Pooled alcohol treatment	11.27*	10.64*	12.08**	11.62**
	(6.371)	(6.191)	(5.053)	(5.031)
Amount won in lottery on previous study day	0.29*		0.32**	
	(0.171)		(0.147)	
Pooled alcohol treatment X Lottery amount		0.36*		0.37**
		(0.200)		(0.169)
Control Group X Lottery amount		0.15		0.21
		(0.300)		(0.272)
Observations	3,435	3,435	3,435	3,435
R-squared	0.004	0.004	0.112	0.112
Baseline survey controls	NO	NO	YES	YES
Phase 1 controls	NO	NO	YES	YES
Control mean	20.42	20.42	20.42	20.42

Notes: This table shows estimates of the impact of lottery winnings on the amounts saved at the study office.

1. All regressions use data from day 5 (the first day of sobriety incentives) through day 19 (the last day of sobriety incentives) of the study. The outcome variable is the amount saved at the study office. If an individual did not visit the study office on any given day of the study, the amount saved is set to zero on this day. Similarly, the daily study payment is zero for those observations.

2. The lottery was conducted on days 10 through 18 of the study. All regressions control for whether individuals participated in the lottery on any given day. Lottery winnings were Rs. 0 (no win), Rs. 30, or Rs. 60. If an individual won in the lottery, he was given a personalized voucher for the respective amount (Rs. 30 or Rs. 60) that was redeemable *only* by this individual *only* on the subsequent study day.

3. Standard errors are in parentheses, clustered by individual. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.

Table 11: Interaction between Sobriety Incentives and Savings Treatments

VARIABLES	(1) Rs/day	(2) Rs/day	(3) Rs/day	(4) Rs/day
Either Incentives or Commitment Savings	19.77**	15.48*		
	(9.037)	(8.679)		
Sobriety Incentives only	0.49	0.06		
	(9.745)	(9.048)		
Both Incentives and Commitment Savings	1.43	2.36		
	(9.562)	(9.997)		
Either Incentives or High Matching Contribution			12.43	12.23
			(8.841)	(9.489)
Sobriety Incentives only			2.42	0.15
			(8.957)	(9.851)
Both Incentives and High Matching Contribution			10.16	8.30
			(9.468)	(9.731)
Observations	3,435	3,435	3,435	3,435
R-squared	0.006	0.037	0.005	0.037
Baseline survey controls	NO	YES	NO	YES
Phase 1 controls	NO	NO	NO	NO
Control mean	20.42	20.42	20.42	20.42

Notes: This table shows estimates of the impact of lottery winnings on the amounts saved at the study office.

1. All regressions use data from day 5 (the first day of sobriety incentives) through day 19 (the last day of sobriety incentives) of the study. The outcome variable is the amount saved at the study office. If an individual did not visit the study office on any given day of the study, the amount saved is set to zero on this day. Similarly, the daily study payment is zero for those observations.
2. Columns (1) and (2) shows the relationship between the effects of offering sobriety incentives and commitment savings. Columns (3) and (4) shows the relationship between the effects of offering sobriety incentives and a high matching contribution.
3. Standard errors are in parentheses, clustered by individual. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.

Table 12: Demand for Incentives over Time

VARIABLES	(1) Rs 90	(2) Rs 90	(3) Rs 90	(4) Rs 120	(5) Rs 120	(6) Rs 120	(7) Rs 150	(8) Rs 150	(9) Rs 150
Week 2	-0.01	0.02	-0.00	0.03	0.05	0.03	0.01	0.02	-0.00
	(0.062)	(0.062)	(0.067)	(0.074)	(0.074)	(0.076)	(0.071)	(0.071)	(0.073)
Week 3	0.01	-0.02	-0.03	-0.00	-0.02	-0.03	0.12	0.11	0.11
	(0.081)	(0.081)	(0.074)	(0.083)	(0.081)	(0.076)	(0.084)	(0.084)	(0.082)
BAC during choice	-1.67***			-1.13***			-0.68**		
	(0.337)			(0.346)			(0.298)		
Days sober in Phase 1		0.04			-0.00			-0.06	
		(0.042)			(0.047)			(0.052)	
Days sober in Phase 2		0.11**			0.08*			0.08*	
		(0.042)			(0.047)			(0.049)	
Incentives increased sobriety			0.05			0.09			0.16**
			(0.065)			(0.080)			(0.074)
Exp frac sober under incentives			0.57***			0.41***			0.22**
			(0.086)			(0.090)			(0.091)
Constant	0.80***	0.44***	0.24**	0.61***	0.40***	0.20**	0.40***	0.30***	0.14
	(0.055)	(0.083)	(0.091)	(0.066)	(0.087)	(0.088)	(0.066)	(0.084)	(0.084)
Observations	199	199	199	199	199	199	199	199	199
R-squared	0.133	0.155	0.222	0.058	0.045	0.112	0.028	0.029	0.064

Notes: This table considers the relationship between the demand for incentives and sobriety for the Choice Group at different points in the study.

1. In all columns, the outcome variable is whether the individual chose incentives over unconditional payments. The unconditional amounts are Rs. 90 in columns (1) through (3), Rs. 120 in columns (4) through (6), and Rs. 150 in columns (7) through (9).

2. "BAC during choice" refers to the subjects' blood alcohol content measured before making choices between incentives and unconditional amounts. "Exp sober days under incentives" are subjects' answers to asking how many days they expected to show up sober if they were to receive incentives for sobriety during the subsequent six days (always asked before choices were made). "Days sober in Phase 1" and "Days sober in Phase 2" refer to the number of days the individual visited the study office sober during Phase 1 and 2, respectively. "Incentives increased sobriety" indicates whether the difference in the fraction of sober days in the phase before choosing and the fraction of sober days in Phase 1 is positive.

3. Standard errors are in parentheses, clustered by individual. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.

Table 13: Demand for Incentives Across Treatment Groups

VARIABLES	(1) Rs 90	(2) Rs 90	(3) Rs 90	(4) Rs 90	(5) Rs 120	(6) Rs 120	(7) Rs 120	(8) Rs 120	(9) Rs 150	(10) Rs 150	(11) Rs 150	(12) Rs 150
Incentives	0.18**	0.13*	0.15**	0.13*	0.19**	0.15*	0.16**	0.15**	0.18**	0.15*	0.16**	0.15*
	(0.081)	(0.074)	(0.068)	(0.067)	(0.085)	(0.083)	(0.075)	(0.076)	(0.085)	(0.083)	(0.078)	(0.079)
Choice	0.08	0.11	0.07	0.08	0.08	0.09	0.07	0.07	0.10	0.12	0.09	0.10
	(0.084)	(0.080)	(0.073)	(0.073)	(0.086)	(0.085)	(0.080)	(0.081)	(0.084)	(0.083)	(0.081)	(0.081)
BAC during choice		-1.77***		-0.82**		-1.14***		-0.27		-1.15***		-0.50
		(0.321)		(0.361)		(0.333)		(0.361)		(0.316)		(0.363)
Exp sober days under incentives			0.10***	0.09***			0.09***	0.08***			0.07***	0.06***
			(0.011)	(0.014)			(0.011)	(0.013)			(0.011)	(0.013)
Observations	202	202	202	202	202	202	202	202	202	202	202	202
R-squared	0.025	0.157	0.298	0.321	0.025	0.074	0.196	0.198	0.025	0.077	0.139	0.147
Control mean	0.569	0.569	0.569	0.569	0.431	0.431	0.431	0.431	0.361	0.361	0.361	0.361

Notes: This table considers how the two sobriety incentives treatments affected the demand for incentives.

1. In all columns, the outcome variable is whether the individual chose incentives over unconditional payments. The unconditional amounts are Rs. 90 in columns (1) through (4), Rs. 120 in columns (5) through (8), and Rs. 150 in columns (9) through (12).

2. "BAC during choice" refers to the subjects' blood alcohol content measured during the visit to the study office when he was choosing between incentives and unconditional amounts. Before making these choices, individuals were asked on how many days they expected to show up sober if they were to receive incentives for sobriety during the subsequent six days. The variable "Exp sober days under incentives" refers to subjects' answer to this question.

3. Standard errors are in parentheses, clustered by individual. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively.

C Supplementary Appendix

C.1 A Special Case: Log Utility

To develop an intuition for the solution, consider log utility, i.e. $u(c_t) = \log(c_t)$.

No commitment savings. Equations (7) and (10) become

$$c_3 = \beta(1+M)c_2 \tag{24}$$

$$c_2 = \left[\beta\frac{dc_2}{dY_2} + \left(1 - \frac{dc_2}{dY_2}\right)\right] c_1 \tag{25}$$

Using $c_3 = (Y_2 - c_2)(1+M)$, we use (24) to solve for c_3 and c_2 as functions of Y_2:

$$c_2 = \frac{1}{1+\beta}Y_2 \quad \text{and} \quad c_3 = \frac{\beta(1+M)}{1+\beta}Y_2 \tag{26}$$

This implies $\frac{dc_2}{dY_2} = \frac{1}{1+\beta}$ and, hence $c_2 = \frac{2\beta}{1+\beta}c_1$ and $c_3 = (1+M)\frac{2\beta^2}{1+\beta}c_1$. Hence, we get

$$c_1 = Y - c_2 - \frac{c_3}{1+M} = Y - \frac{2\beta}{1+\beta}c_1 - \frac{2\beta^2}{1+\beta}c_1 = \frac{Y}{1+\frac{2\beta}{1+\beta}+\frac{2\beta^2}{1+\beta}} \tag{27}$$

This implies $c_3^{\text{NC}} = \frac{2\beta^2}{1+3\beta+2\beta^2}Y(1+M)$.

Commitment savings. Consider now the the solution for the commitment savings case. Equations (11) and (12) become

$$c_2 = \beta c_1 \qquad c_3 = (1+M)c_2 \tag{28}$$

Using the budget constraint (13), this yields

$$c_3^C = (Y - c_1 - c_2)(1+M) \tag{29}$$

$$= Y(1+M) - \frac{c_3}{\beta} - c_3 \tag{30}$$

$$= \frac{\beta}{1+2\beta}Y(1+M) \tag{31}$$

Comparing the two solutions yields

$$\Delta \equiv c_3^{\mathrm{C}} - c_3^{\mathrm{NC}} = \left[\frac{\beta}{1+2\beta} - \frac{2\beta^2}{1+3\beta+2\beta^2}\right] Y(1+M) \tag{32}$$

$$\left[\frac{\beta(1-\beta)}{(1+2\beta)(1+\beta)}\right] Y(1+M) \tag{33}$$

Taking the derivative of the expression in brackets with respect to β yields

$$\frac{\partial[\cdot]}{\partial\beta} = \frac{1-2\beta-5\beta^2}{(1+3\beta+2\beta^2)^2} \tag{34}$$

This expression is positive from for $0 \leq \beta \approx 0.29$ and negative for $0.29 \approx \beta \leq 1$.

Table A.1: Balance Table for Main Demographs

	Treatment groups			**p value for test of:**		
	Control	Incentives	Choice	1=2	1=3	$1 = (2 \cup 3)$
	(1)	(2)	(3)	(4)	(5)	(6)
Age	36.54	35.27	35.08	0.43	0.29	0.30
	(9.96)	(9.92)	(7.40)			
Married	0.82	0.80	0.81	0.80	0.92	0.84
	(0.39)	(0.40)	(0.39)			
Number of children	1.80	1.77	1.80	0.93	0.98	0.97
	(1.19)	(1.55)	(1.19)			
Lives with wife in Chennai	0.73	0.72	0.73	0.82	0.98	0.88
	(0.44)	(0.45)	(0.45)			
Wife earned income during past month	0.24	0.17	0.28	0.27	0.58	0.80
	(0.43)	(0.38)	(0.45)			
Years of education	4.89	5.45	5.49	0.38	0.34	0.28
	(3.93)	(3.95)	(3.92)			
Able to read the newspaper	0.63	0.62	0.63	0.93	1.00	0.96
	(0.49)	(0.49)	(0.49)			
Added 7 plus 9 correctly	0.86	0.77	0.77	0.20	0.19	0.12
	(0.35)	(0.42)	(0.42)			
Multiplied 5 times 7 correctly	0.48	0.41	0.47	0.36	0.85	0.53
	(0.50)	(0.50)	(0.50)			
Distance of home from office (km)	2.64	2.30	2.65	0.20	0.99	0.54
	(2.15)	(1.06)	(1.72)			
Years lived in Chennai	31.57	27.77	29.16	0.04**	0.17	0.05*
	(12.19)	(11.10)	(9.81)			
Reports having ration card	0.65	0.52	0.61	0.11	0.63	0.22
	(0.48)	(0.50)	(0.49)			
Has electricity	0.81	0.68	0.75	0.07*	0.37	0.10
	(0.40)	(0.47)	(0.44)			
Owns TV	0.76	0.59	0.68	0.03**	0.27	0.05**
	(0.43)	(0.50)	(0.47)			
Happiness ladder score (0 to 10)	5.73	5.46	5.76	0.43	0.94	0.68
	(2.14)	(2.08)	(2.11)			

Notes: This table shows balance checks for main demographics across the incentive treatment groups. Columns 1 through 3 show means and standard deviation for individuals in the Control Group (1), Incentive Group (2), and the Choice Group (3), respectively. Standard deviations are in parentheses. Columns 4 through 6 show p-values of OLS regressions of each variable on dummies for each treatment group. Columns 4 and 5 shows p values of tests for equality of means between the Incentive and Choice Group compared to the Control Group, respective. Column 6 shows the corresponding p values that compare both Incentive and Choice Groups combined to the Control Group.

Table A.2: Balance Table for Work and Savings

	Treatment groups			**p value for test of:**		
	Control	Incentives	Choice	1=2	1=3	$1 = (2 \cup 3)$
	(1)	(2)	(3)	(4)	(5)	(6)
Years worked as a rickshaw puller	14.06	12.49	12.81	0.29	0.34	0.25
	(9.53)	(8.78)	(6.73)			
# of days worked last week	5.41	5.18	5.43	0.36	0.94	0.60
	(1.35)	(1.65)	(1.39)			
Has regular employment arrangement	0.47	0.52	0.47	0.53	0.97	0.74
	(0.50)	(0.50)	(0.50)			
Owns rickshaw	0.17	0.25	0.28	0.20	0.10⋆	0.08⋆
	(0.38)	(0.44)	(0.45)			
Says 'no money' reason for not owning rickshaw	0.61	0.65	0.59	0.67	0.72	0.98
	(0.49)	(0.48)	(0.50)			
Reported labor income in Phase 1 (Rs/day)	291.86	301.08	273.94	0.69	0.39	0.79
	(119.97)	(160.54)	(138.33)			
Total savings (Rs)	13261	23903	38184	0.22	0.13	0.07⋆
	(31197)	(67739)	(139224)			
Total borrowings (Rs)	11711	5648	7913	0.11	0.36	0.18
	(29606)	(15762)	(22253)			
Savings at study office in Phase 1 (Rs/day)	40.98	44.67	41.04	0.62	0.99	0.77
	(41.93)	(49.28)	(48.25)			

Notes: This table shows balance checks for work- and savings-related variables across the incentive treatment groups. Columns 1 through 3 show means and standard deviation for individuals in the Control Group (1), Incentive Group (2), and the Choice Group (3), respectively. Standard deviations are in parentheses. Columns 4 through 6 show p-values of OLS regressions of each variable on dummies for each treatment group. Columns 4 and 5 shows p values of tests for equality of means between the Incentive and Choice Group compared to the Control Group, respective. Column 6 shows the corresponding p values that compare both Incentive and Choice Groups combined to the Control Group.

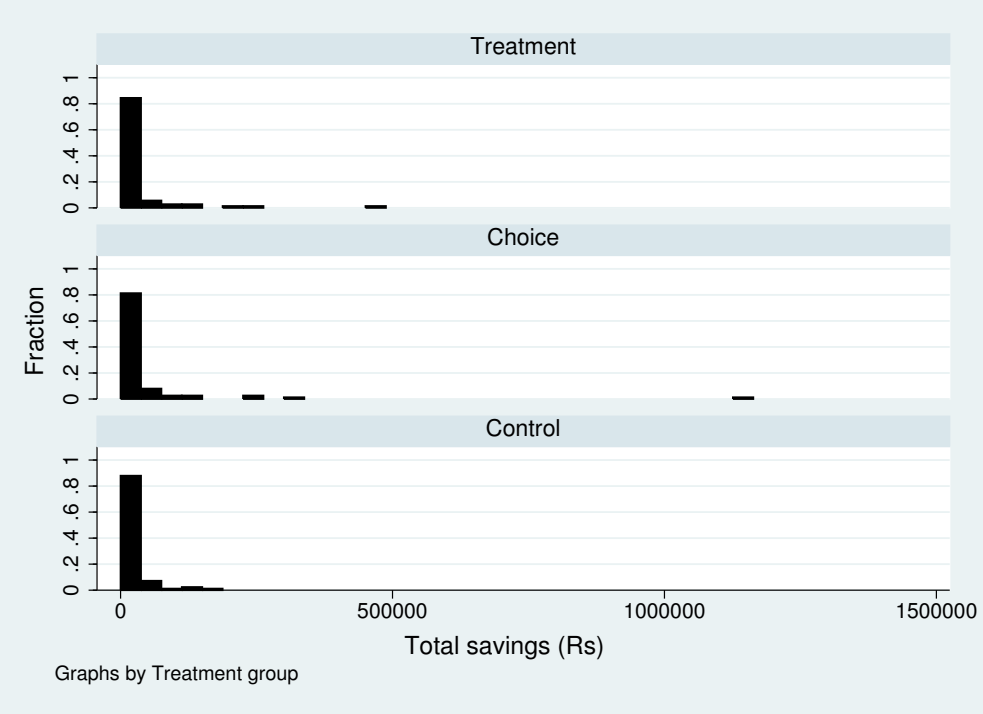
Table A.3: Balance Table for Alcohol Consumption

	Treatment groups			**p value for test of:**		
	Control	Incentives	Choice	1=2	1=3	$1 = (2 \cup 3)$
	(1)	(2)	(3)	(4)	(5)	(6)
Years drinking alcohol	12.89	11.68	12.86	0.42	0.99	0.65
	(10.02)	(8.42)	(9.03)			
Number of drinking days per week	6.72	6.83	6.68	0.39	0.70	0.77
	(0.80)	(0.76)	(0.60)			
Drinks usually hard liquor ($\geq$ 40 % alcohol)	0.99	1.00	0.99	0.32	0.94	0.71
	(0.11)	(0.00)	(0.12)			
Alcohol expenditures in Phase 1 (Rs/day)	91.95	87.09	81.92	0.39	0.07*	0.12
	(37.03)	(32.48)	(32.98)			
# of standard drinks per day in Phase 1	6.17	5.71	5.80	0.21	0.31	0.19
	(2.29)	(2.17)	(2.18)			
# of std drinks before during day in Phase 1	2.13	2.45	2.40	0.38	0.42	0.31
	(2.01)	(2.48)	(2.10)			
Baseline fraction sober	0.49	0.45	0.43	0.48	0.30	0.30
	(0.40)	(0.43)	(0.41)			
Alcohol Use Disorders Identification Test score	14.61	13.94	14.69	0.44	0.92	0.67
	(4.32)	(6.16)	(4.98)			
Drinks usually alone	0.87	0.82	0.85	0.40	0.80	0.51
	(0.34)	(0.39)	(0.36)			
Reports life would be better if liquor stores closed	0.84	0.80	0.77	0.52	0.27	0.29
	(0.37)	(0.40)	(0.42)			
In favor of Prohibition	0.81	0.77	0.84	0.62	0.59	0.99
	(0.40)	(0.42)	(0.37)			
Would increase liquor prices	0.07	0.14	0.12	0.18	0.32	0.15
	(0.26)	(0.35)	(0.33)			

Notes: This table shows balance checks for alcohol-related variables across the incentive treatment groups. Columns 1 through 3 show means and standard deviation for individuals in the Control Group (1), Incentive Group (2), and the Choice Group (3), respectively. Standard deviations are in parentheses. Columns 4 through 6 show p-values of OLS regressions of each variable on dummies for each treatment group. Columns 4 and 5 shows p values of tests for equality of means between the Incentive and Choice Group compared to the Control Group, respective. Column 6 shows the corresponding p values that compare both Incentive and Choice Groups combined to the Control Group.

Figure A.1: Reported Sum of Total Savings by Incentive Treatment Group at Baseline

(a) All individuals



(b) Only individuals with savings below Rs. 200,000