Alcohol and Self-Control: A Field Experiment in India

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Abstract

High levels of alcohol consumption are more common among the poor. This fact 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 savings behavior and on self-control. 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. The incentives significantly reduced daytime drinking as measured by decreased breathalyzer scores, which in turn increased savings by approximately 60 percent. This effect is not purely mechanical as it does not appear to be explained by changes in income net of alcohol expenditures. Moreover, 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 remain sober, exhibiting demand for commitment to increase their sobriety. Taken together, 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.

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1 Introduction

Heavy alcohol consumption is correlated with poverty, yet the nature and consequences of this relationship are not well understood. Poverty could cause demand for alcohol by enhancing its short-term benefits since alcohol can temporarily lower physical and mental pain, help individuals fall asleep, make them feel better about themselves, and relieve stress and anxiety.[1] However, poverty may also be *caused* by excessive alcohol consumption. In particular, alcohol is thought to affect myopia and self-control. If such effects are large, then heavy alcohol consumption could interfere with a variety of forward-looking decisions. By affecting savings decisions, insurance take-up, 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 peddlers in Chennai, India, in which all subjects were provided with a high-return savings opportunity. To create exogenous variation in alcohol consumption, a randomly-selected subset of study participants was offered financial incentives for sobriety. The remaining individuals received similar study payments, but were paid unconditionally. For a cross-randomized subset of study participants, the savings account was a commitment savings account, i.e. individuals could not withdraw their savings until the end of their participation in the study. This feature allowed 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 assess the extent to which self-control problems themselves contribute to the demand for alcohol.

The incentives to remain sober significantly increased individuals' sobriety during their daily study office visits and therefore during their savings decisions, providing a "first stage" to estimate the impact of sobriety on savings behavior. Individuals who were given these incentives decreased their daytime drinking as measured by a 33 percent increase in the fraction of individuals who visited the study office sober. However, overall alcohol consumption and expenditures remained nearly unchanged, implying that individuals largely shifted their drinking to later times of the day rather than reducing it as a response to the incentives.

[1] Alcohol is known to be a powerful anesthetic (Woodrow and Eltherington 1988); it helps individuals fall asleep (Ebrahim et al. 2013) 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)). Moreover, physical pain, sleep deprivation, low self-esteem, and stress are all correlated with poverty (Patel (2007), Poleshuk and Green (2008), Patel et al. (2010), Haushofer and Fehr (2014)).

Moreover, changes in daily earnings from work were small and statistically insignificant. In contrast, offering incentives for sobriety increased individuals' daily savings at the study office by about 60 percent compared to a control group that received similar average study payments independent of their alcohol consumption.

This increase in savings is a combination of changes in income net of alcohol expenditures and changes in decision-making for *given* resources. Since the incentives increased the former only slightly, it appears that increased sobriety altered individuals' savings behavior for given resources. The relationship between the effects of sobriety incentives and commitment savings provides further evidence of this hypothesis. In particular, I find that sobriety incentives and the commitment savings feature were substitutes in terms of their effect on savings. While commitment savings 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. These patterns are consistent with acute intoxication increasing present bias and in turn causing self-control problems in savings decisions.[2]

Self-control problems in turn contributed to the demand for alcohol. 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 most other settings, for instance for smoking, exercising, or saving (Gine et al. 2010; Royer et al. 2014; Ashraf et al. 2006). Specifically, in three sets of weekly decisions that each elicited preferences for sobriety incentives in the subsequent week, over half of the study participants chose options that implied weakly-dominated study payments. Even more striking, over a third of study participants preferred incentives for sobriety over unconditional payments, even when the latter were *strictly* higher than the maximum amount subjects could earn with the incentives. These individuals were willing to sacrifice study payments of about 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 and in contrast to the existing (lack of) evidence of demand for costly commitment in most other settings (Augenblick et al. 2015).[3]

[2]An alternative interpretation is that the incentives mitigated the need for commitment savings by reducing the consumption of alcohol, a key temptation good for this population. However, this interpretation is inconsistent with the fact that the intervention only slightly reduced overall drinking or shifted it to later times of the day rather than causing abstinence from alcohol on any given day.

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

The high demand for commitment does not appear to be the result of misunderstandings on the part of the subjects. Willingness to pay for sobriety incentives did *not* decrease over time among individuals who were asked to choose repeatedly. In fact, past exposure to the incentives *increased* individuals' demand for the incentives. Individuals who had been randomly selected to receive incentives for sobriety for 15 days were significantly more likely to choose incentives for a subsequent week compared to individuals who had received payments independent of their sobriety. Further, individuals whose sobriety increased in response to the incentives were particularly likely to choose the incentives subsequently. Moreover, individuals with lower concurrent inebriation levels were *more* likely to choose the incentives. Finally, reassuringly, the demand for the incentives decreased in their costs.

The finding that alcohol *causes* self-control problems is in line with on psychology research on "alcohol myopia" (Steele and Josephs 1990). This research sought to reconcile the seemingly contradictory effects of alcohol found in a large body of previous research. For instance, depending on circumstances, alcohol can relieve or increase anxiety and tension. It can inflate egos, yet lead to low self-esteem. However, a defining feature of alcohol consumption is that it *always* narrows attention, which in turn causes individuals to focus on simple, present, and salient cues. Steele and Josephs (1990) argue that alcohol has particularly strong effects in situations of "inhibition conflict," i.e. with two competing motivations, one of which is simple, present, or salient, while the other is complicated, in the future, or remote.[4] One interpretation of this theory is that alcohol causes present bias. The findings from my field experiment support this interpretation in the context of savings

price changes by the two competing models, Gruber and Kőszegi (2001) were not able to reject Becker and Murphy's (1988) model in favor of their own. The ensuing literature produced suggestive but inconclusive evidence in the smoking domain (Gruber and Mullainathan 2005). Two recent examples in the context of alcohol consumption found mixed results (Bernheim et al. (2016) and Hinnosaar (2016)). Finally, other theories 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), or Fudenberg and Levine (2006). For detailed overviews on the empirical and theoretical literature on commitment devices, see DellaVigna (2009) and Bryan et al. (2010).

[4]In a series of studies, Steele and several co-authors aimed to explain a range of social behaviors caused by alcohol, emphasizing the effects of alcohol on aggression and altruism (Steele and Southwick (1985), Steele et al. (1985)). These studies and subsequent work on alcohol myopia did *not* study savings decisions or intertemporal choice (Giancola et al. 2010). However, many cross-sectional studies, including several on alcohol, found a correlation between impulsive "delayed reward discounting" (DRD) and addictive behavior, without establishing existence or direction of causality (MacKillopp et al. (2011), Vuchinich and Simpson (1999)). Experimental lab studies consistently found that acute alcohol intoxication reduced inhibitory control in computer tasks (Perry and Carroll 2008), but the two studies conducted so far did not find effects on impulsive DRD (Richards et al. 1999). In fact, to their own surprise, Ortner et al. (2003) found that alcohol intoxication *reduced* impulsivity. My study differs from previous experimental studies in a number of ways. In particular, (i) the duration of the experiment was significantly longer (over three weeks vs. one day), (ii) sample characteristics were markedly different (low-income workers vs. college students; higher levels of regular drinking), (iii) stakes were higher (relative to income), and (iv) the main outcome was the amount saved after three weeks (as opposed to impulsive DRD).

decisions and demonstrate that alcohol-induced myopia can have economically meaningful consequences. Ben-David and Bos (2017) provide complementary evidence on the impact of alcohol availability on credit-market behavior in Sweden.

Moreover, this paper contributes to a long line of research on poverty traps going back to at least Leibenstein (1957) and Dasgupta and Ray (1986). More specifically, the paper contributes to the literature on the relationship between alcohol and poverty. Excessive alcohol consumption has long been associated with poverty (Fisher 1926; USAID 2003). For instance, a report on chronic poverty in Uganda considers alcohol to be a "key driver of chronic poverty" (DRT and CPRC 2013). Similarly, studies in Sri Lanka found alcohol to be an "important factor in the maintenance of poverty" (Baklien and Samarasinghe 2005). However, academic research on this topic is scarce, especially in developing countries. This paper takes a first step toward filling this gap. Moreover, the paper adds to the literature on poverty and self-control, which goes back to at least Fisher (1930).[5] 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 the consumption of these goods, but, in the case of alcohol, may also reduce self-control problems in other domains.

This paper also contributes to the growing literature on saving decisions among the poor (Karlan et al. 2014). Several recent studies find that the availability and design of savings accounts are important determinants of savings behavior among the poor (Ashraf et al. (2006), Dupas and Robinson (2013a), Dupas and Robinson (2013b), Kast et al. (2014), Prina (2015), Brune et al. (2016), Karlan et al. (2016), Schaner (2017)). Existing studies emphasize the importance of technologies for committing to savings. This paper argues that helping individuals to overcome underlying self-control problems regarding specific goods can be a substitute for commitment devices for overall consumption-saving decisions. More generally, it argues that time preferences are malleable, in line with Becker and Mulligan (1997), and, more recently in the context of saving among the poor, Carvalho et al. (2016).

The results from this paper have the potential to inform alcohol policy, a much-debated topic in developing countries. In India, where hazardous use of alcohol is on the rise, different states have chosen a wide range of policy options ranging from prohibition (Gujarat) to

[5]This literature was recently revived by several theoretical and empirical contributions. On the theory side, Banerjee and Mullainathan (2010) and Bernheim et al. (2015) 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).

government provision (Tamil Nadu), and private provision (Delhi) of alcohol (Rahman 2003; Prasad 2009). When making such choices, policymakers 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 investigating the relationship between alcohol and self-control, a key aspect in the consideration of policy options such as "sin taxes" or even prohibition (O'Donoghue and Rabin 2006; Gruber and Kőszegi 2001).

Finally, this paper contributes to our understanding of the effectiveness of incentives to encourage health-related behavior. Financial incentives are among the most successful policies to reduce drug consumption in general and alcohol consumption in particular (Anderson et al. 2009; Wagenaar et al. 2009). Providing short-run financial or other incentives can have substantial short-term and long-term effects on a number of health-related behaviors (Petry et al. (2000), Prendergast et al. (2006), Volpp et al. (2008), Charness and Gneezy (2009), Higgins et al. (2012), Dupas (2014)). In contrast to existing studies, I do not find evidence of effects of short-run incentives on alcohol consumption beyond the incentivized period. In fact, the impact of the incentives on day drinking is almost entirely compensated by increased drinking after visiting the study office.

The remainder of this paper is organized as follows. Section 2 provides an overview of 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 discusses randomization checks. Section 4 then considers the impact of increased sobriety on savings, and Section 5 investigates the interaction between sobriety and commitment savings. Section 6 considers the extent to which self-control problems contribute to the demand for alcohol. 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 patterns among low-income individuals in Chennai, India. 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

low-income professions in Chennai in August and September 2014.[6] Surveyors approached individuals from these groups during the day and offered them a small compensation for answering a short questionnaire about their alcohol consumption, including a breathalyzer test. Based on these surveys, this section describes summary statistics of drinking patterns for the ten professions.

The overall prevalence of alcohol consumption among low-income men is high (upper panel of 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). In addition, on days when individuals consume alcohol, they drink considerable quantities of alcohol (lower panel of Figure 1). Conditional on drinking alcohol on the previous day, men of the different professions reported drinking average amounts ranging from 3.8 to 6.5 standard drinks on this day.[7] Since alcohol is an expensive good, the resulting income shares spent on alcohol are enormous (upper panel of Figure C.1). On average, individuals reported spending between 9.2 and 43.0 percent of their daily income of Rs. 300 ($5) 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. Finally, 25.2 percent of individuals were inebriated or drunk during these surveys, which all took place during the day (lower panel of Figure C.1).

2.2 Alcohol Consumption in India and in Developing Countries

The substantial level of alcohol consumption found among low-income workers in Chennai raises the question of how these numbers compare to other estimates for Chennai, for India, and for developing countries overall. Limited data availability and data inconsistencies make answering this question difficult (Gupta et al. 2003). In particular, data on breathalyzer scores are rare. However, there is reason to believe that the estimates for Chennai are not unusual compared to other parts of India or other developing countries. The WHO Global Status Report on Alcohol and Health makes country-by-country estimates of alcohol prevalence and consumption levels (WHO 2014). According to this report, the daily average

[6]The prevalence of alcohol consumption among women in Chennai and in India overall is substantially lower. It is 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 (reported) prevalence of female alcohol consumption was 2.2 percent (IIPS and Macro International 2008). It is highest in the lowest wealth (6.2 percent) and education (4.3 percent) quintiles.

[7]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.

quantity of alcohol consumed by male drinkers in India, about a quarter of the total male population, is only slightly higher than the average of the physical quantities shown in Figure 1. Moreover, the average male Indian drinker consumes about five standard drinks per day, exceeding the estimates for German, American, and even Russian drinkers.[8] In comparison, individuals who drank alcohol on the previous day in Chennai report drinking on average about 5.3 standard drinks per day.

Looking beyond India, male drinkers in Uganda (56 percent of the male population) consume about 4 standard drinks per day. The prevalence of male alcohol consumption is somewhat lower in other Sub-Saharan countries, but the physical quantities drinkers consume are similarly high.[9] Alcohol consumption has also been steeply on the rise in China in recent years. According to the most recent WHO estimates, male Chinese drinkers (58.4 percent of the male population) consume 2.9 standard drinks per day.

There is also evidence from developing countries that heavy alcohol consumption is more prevalent among the poor compared to the rich. 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 (USAID 2003). 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. However, rigorous evidence of this causal relationship is scarce.

[8]Some assumptions in this calculation may be questioned. In particular, the WHO (2014) report 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 alcohol consumption 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 over four standard drinks per drinker and day. In addition, other studies find significantly lower prevalence of drinking in India (e.g. Subramanian et al. (2005)).

[9]For instance, the average drinker in Rwanda is estimated to consume 4.2 standard drinks per day. These numbers are similar for Burundi (4.1 standard drinks), Kenya (3.5 standard drinks), and Tanzania (3.4 standard drinks).

3 Experimental Design and Balance Checks

The first part of this section provides 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. I then provide detailed information about the timeline and treatment conditions, and follow with a description of the mechanism used to elicit willingness to pay for sobriety incentives and the outcomes of interest of the experiment. Finally, I discuss summary statistics for the study sample and balance checks.

3.1 Overview of Experimental Design

Between April and September 2014, 229 cycle-rickshaw peddlers working in central Chennai were asked to visit a nearby study office every day for three weeks each. During these daily visits, individuals completed a breathalyzer test and a short survey on labor supply, earnings, and expenditure patterns on the previous day, and alcohol consumption both on the previous day and on the same day before coming to the study office. To study the impact of increased sobriety due to financial incentives on savings behavior, we gave all subjects the opportunity to save money at the study office. Additionally, participants were randomly assigned to various treatment groups with the following considerations. First, to create exogenous variation in sobriety, we offered a randomly selected subsample of study participants 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 was provided with a commitment savings account, i.e. a savings account that did not allow them to withdraw their savings until the end of their participation in the study. Third, to identify self-control problems regarding alcohol, a randomly selected subset of individuals was 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.[10] Individuals enrolled in the study went through a three-stage recruitment and screen-

[10]The study population included both passenger cycle-rickshaw peddlers as in Schofield (2014) and cargo cycle-rickshaw peddlers. Schofield (2014) exclusively enrolled passenger-rickshaw peddlers with a body-mass index (BMI) below 20. To avoid overlap between the two samples, my study only enrolled passenger cycle-rickshaw peddlers with a BMI above 20. There was no BMI-related restriction for cargo cycle-rickshaw peddlers.

ing 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 near the study office during work hours, and asked interested individuals to answer a few questions to determine their eligibility to participate in "a paid study in Chennai." The main goals of this screening process were: (a) to ensure a homogenous sample, (b) to facilitate efficient communication, (c) to limit attrition from the study due to reasons unrelated to alcohol consumption. Individuals were eligible to proceed to the next stage if they met the following screening criteria: (i) males between 25 and 60 years old, inclusive, (ii) fluency in Tamil, the local language, (iii) had worked at least five days per week on average as a rickshaw puller during the previous month, (iv) had lived in Chennai for at least six months, (v) reported no plans to leave Chennai during the ensuing six weeks, and (vi) self-reported an average daily consumption of 0.7 to 2.0 "quarters" of hard liquor (equivalent to 3.0 to 8.7 standard drinks) per day.[11] 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 detailed office screening procedure 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 conditions 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 (DTs), a severe and potentially even lethal medical condition (Wetterling et al. 1994; Schuckit et al. 1995).

Lead-in period. Overall attrition and, in particular, differential attrition are first-order

[11] "Quarters" refer to small bottles of 180 ml each. Nearly 100% of drinkers among cycle-rickshaw peddlers (and most other low-income populations in Chennai) consume exclusively hard liquor, specifically rum or brandy. The drinks individuals consume contain over 40 percent alcohol by volume (80 proof), and they maximize the quantity of alcohol per rupee. One quarter of hard liquor is equivalent to approximately 4.35 standard drinks. The lower bound on the number of quarters was chosen to ensure a potential treatment effect of the incentives on alcohol consumption. The upper bound on the number of quarters was chosen to lower the risk of serious withdrawal symptoms.

threats to the validity of any randomized-controlled trial. In my study, attrition was of particular concern since the study required participants to visit the study office every day for three weeks with varying payment structures across treatment groups. Moreover, in early-stage piloting, a non-negligible fraction of individuals visited the study office on the first day, which provided high renumeration to compensate for the time-consuming enrollment procedures, but then dropped out of the study relatively quickly. To avoid this outcome in the study and to limit attrition more generally, participants were required to attend on three consecutive study days (the "lead-in period") before being fully enrolled in the study and informed about their treatment status. They were allowed to repeat the lead-in period once if they missed one or more of the three consecutive days during their first attempt.

Selection. At each stage, between 64 and 83 percent of individuals were able and willing to proceed to the subsequent stage (Table C.1). Among individuals 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 participate in the survey when first approached (14 percent), or were not interested in learning more about the study after participating in the survey and found to be eligible (7 percent). The majority among the remaining individuals (12 percent) participated in the survey but did not meet the drinking criteria outlined above, primarily because they were abstinent from alcohol or reported drinking less than 3 standard drinks per day on average (11 percent). During the next stage, the office screening survey, 83 percent of individuals were found eligible. The majority of the 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 2 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, at a time of their choosing between 6 pm and 10 pm. The office was located in the vicinity of their usual area of work to limit the time required for the visit. 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). This period served to gather baseline data in the absence of

incentives and to screen individuals for willingness to visit the study office regularly. On day 4, individuals were randomly allocated to one of the following three experimental conditions for the subsequent 15 days.

(I) **Control Group.** The Control Group was paid Rs. 90 ($1.50) per visit regardless of BAC on days 5 through 19. These participants simply continued with the payment schedule from Phase 1.

(II) **Incentive Group.** The Incentive Group was given incentives to remain sober on days 5 through 19. These payments consisted of Rs. 60 ($1) for visiting the study office and an additional Rs. 60 if the individual was sober as measured by a score of zero on the breathalyzer test. Hence, the payment was Rs. 60 if they arrived at the office with a positive BAC and Rs. 120 if they arrived sober. Given the reported daily labor income of about Rs. 300 ($5) in the sample, individuals in the Incentive Group received relatively high-powered incentives for sobriety.

(III) **Choice Group.** To familiarize individuals with the incentives, the Choice Group was given the same incentives as the Incentive Group in Phase 2 (days 5 to 7). Then, right before the start 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 ranging from Rs. 90 ($1.50) to Rs. 150 ($2.50), as described below.

Eliciting willingness to pay for incentives. On days 7 and 13 of the study, surveyors elicited individuals' preferences for each of the three choices described below. Each of these choices consisted of a tradeoff between two options. The first option, Option A, was the same for all choices. The payment structure in this option was the same as in the Incentive Group, i.e. a payment of Rs. 60 ($1) for arriving with a positive BAC, and Rs. 120 ($2) for arriving sober. 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, we elicited preferences for all three choices before one of these choices was randomly selected to be implemented.[12] However, to maintain similar

[12]This is an application of the "random-lottery incentive system" (RLIS), in which researchers ask a subject to make decisions in several choice situations, one of which is randomly selected to be implemented once all decisions are made. Experimental economists extensively use this method, for instance, recently Augenblick et al. (2015), Andreoni and Sprenger (2012), or Augenblick and Rabin (2016). Holt (1986) put forward a theoretical criticism suggesting that subjects may not perceive every choice situation as isolated, but instead treat all choices as a grand meta-lottery. However, in subsequent experimental work, Starmer and Sugden (1991) and Hey and Lee (2005) did not find evidence to support this concern. For a brief summary of the debate, see Wakker (2007).

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 actually only paid out to a small number of individuals in the Choice Group.[13]

	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

I designed these choices with two main objectives in mind: first, to elicit individuals' demand for commitment to sobriety and, hence, potential self-control problems regarding alcohol consumption; second, to allow the Choice Group to be part of the evaluation of the impact of incentives for sobriety. In addition, given low literacy and numeracy levels in the study sample, the design seeks to minimize the complexity of decisions while achieving the other two objectives. More specifically, Option A was the same across choices, and individuals were given three study days to familiarize themselves with these incentives during Phase 2. Accordingly, in all three choices, subjects knew Option A from previous office visits, and Option B was simply a fixed payment regardless of BAC as already experienced in Phase 1. To address potential concerns regarding anchoring effects, we randomized the order of choices. Half of the participants made their choices in the order as outlined above, and the remaining individuals completed their choices in the opposite order.

Demand for commitment. The choice of the conditional payment (Option A) in Choice 1 is *not* evidence of demand for commitment. An individual who did not prefer to change his drinking patterns may have chosen Option A if he expected to visit the study office sober at least 50 percent of the time and, therefore, to receive higher average study payments than he would from choosing Option B. In contrast, study payments in Option B weakly dominated those in Option A for Choice 2. Therefore, choosing Option A in Choice 2 is evidence of

[13]Before making their choices, study participants were instructed to take all choices seriously since each choice had a positive probability of being implemented. Individuals were *not* informed regarding the specific probabilities of implementing each of the choices. One potential concern regarding the procedure to elicit demand for commitment in this study is that subjects' choices may have been affected by the fact that none of the choices was implemented with certainty. Such effects would be a particular concern for this study if they increased the demand for commitment. However, the existing evidence suggests that introducing uncertainty into intertemporal choices *reduces* present bias as measured by the 'immediacy effect' (Keren and Roelofsma 1995; Weber and Chapman 2005).

demand for commitment to increase sobriety, which reveals underlying self-control problems. Furthermore, study payments in Option B *strictly* dominated those in Option B for Choice 3. Choosing Option A in Choice 3 implied sacrificing Rs. 30 ($0.50) in study payments per day even during *sober* visits to the study office, a non-trivial amount given reported labor income of about Rs. 300 ($5) per day.

Endline. On day 20 of the study, all participants were asked to come to the study office once again for an endline visit at any time of the day. No incentives for sobriety were provided on this day. During this visit, surveyors conducted the endline survey with individuals, and participants were returned the money they had saved. Moreover, *all* study participants were given the same set of three choices, described above. This allows me to test whether exposure to incentives for sobriety affected subsequent demand for incentives. We again elicited preferences for all three choices and then randomly selected one of them to be implemented to ensure incentive compatibility. However, the choices from day 20 were only implemented for a randomly selected five percent of individuals for budgetary and logistical reasons. We invited these selected individuals to visit the study office for six additional days. For the remaining study participants, the endline visit was the last scheduled visit to the study office.

Follow-up visits. To measure potential effects of the intervention beyond the incentivized period, surveyors attempted to visit each study participant about one week after their last scheduled office visit. We announced this visit during the informed consent procedures and reminded participants of this visit on day 20 of the study. However, we did not inform participants regarding the exact day of this follow-up visit. During this visit, individuals were breathalyzed and surveyed once again on the main outcomes of interest. The compensation for this visit did *not* depend on the individuals' breathalyzer scores.

3.4 Outcomes of Interest, Savings Treatments, and Lottery

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. We collected daily data during each study office visit by measuring individuals' blood alcohol content (BAC) and via self-reports regarding drinking times, quantities consumed and amounts spent on alcohol. BAC was measured via breathalyzer

tests using devices with a US Department of Transportation level of precision.[14] During each visit, *after* the breathalyzer test (in an attempt to maximize truthfulness of answers), we asked individuals about their alcohol consumption on the same day prior to visiting the study office and about their overall alcohol consumption on the previous day.

Saving. To study individuals' savings behavior, we gave all individuals the opportunity to save money in an individual savings box at the study office. During each office visit, study participants could save up to Rs. 200, using either payments received from the study or money from other sources. We cross-randomized two features of the savings opportunity to the sobriety-incentive treatment groups.

(i) **Matching contribution rate.** Individuals were given a matching contribution ("savings bonus") as an incentive to save. During their endline visit, subjects were paid out their savings plus a matching contribution, randomized with equal probability to be either 10% or 20% of the amount saved.[15] Hence, even in a setting with high daily interest rates, saving money at the study office was a high-return investment for many study participants.

(ii) **Commitment savings.** Half of the 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 pm and 10 pm, they were only allowed to withdraw money at the end of their participation in the study.[16] 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 pm and 10 pm.

I designed the savings option to serve three purposes. First, it allows me to study the impact of increased sobriety on savings behavior and, more generally, the impact of alcohol on inter-temporal choices and investments in high-return opportunities. Second, the cross-randomized commitment savings feature permits the consideration of the relationship between sobriety and self-control in savings decisions. Third, it helped some study participants avoid using the money received from the study to drink alcohol on the same evening

[14] As in Burghart et al. (2013), this study uses breathalyzer model AlcoHawk PT500 (Q3 Innovations LLC). For more information on the measurement of BAC via breathalyzers, see O'Daire (2009).

[15] Individuals found the matching contribution easier to understand than a daily interest rate on savings during early-stage piloting work. The implied daily interest rate from saving an additional rupee increased for each participant over the course of his participation in the study. However, anecdotal evidence suggests that few individuals were aware of this feature.

[16] For ethical reasons, all individuals had the option to leave the study and withdraw all of their money on any day of the study.

or on subsequent days.

Lottery. In addition to the payments described above, we gave study participants the opportunity to earn additional study payments via a lottery on days 10 through 18 of the study. We implemented the lottery as follows: If the participant arrived at the study office on a day on which he was assigned to participate in 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, each at a small probability. 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 received the equivalent cash amount at the beginning of his visit. The lottery allows me (i) to estimate the impact of increased study payments on labor supply and earnings, (ii) to estimate the impact of study payments on attendance and savings at the study office, and (iii) to test whether sobriety incentives increased the marginal propensity to save.

Labor-market outcomes included reported earnings, labor supply, and productivity. We measured these outcomes 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 calculated as income per hour worked.

Expenditure patterns. To measure potential treatment effects on individuals' expenditure patterns, study participants were asked to report (i) amounts given to their wives and other family members, (ii) expenditures on food, and (iii) expenditures on 'temptation goods' including tea, coffee, and tobacco.

3.5 Sample Characteristics and Randomization Checks

Appendix Tables C.2 through C.4 summarize study participants' key background characteristics and consider balance of these characteristics across treatment groups. Tables C.2 and C.3 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 across treatment groups for some characteristics. 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.[17]

[17]Among the demographics in Table C.2, the Control Group reported having lived for a few years longer in Chennai, and they were more likely to have electricity and a TV. In addition, they were somewhat less likely to own a rickshaw. In contrast, the overall fraction of individuals who reported 'lack of money' as

Most notably among these, individuals in the Control Group reported lower savings at baseline than in the Incentive and Choice 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. There is no statistically significant difference in the comparisons between the Incentive and Choice Group with the Control Group individually. However, the difference in reported baseline savings is statistically significant when comparing the Control Group to the Incentive and Choice Groups combined. As illustrated in Appendix Figure C.2, this difference is driven entirely by six individuals who reported very high savings, among them one individual in the Choice Group who reported having Rs. 1 million in cash savings at his home.[18]

Differences in savings reported at baseline were *not* responsible for the savings result shown below. First, there were only small and statistically-insignificant differences in savings at the study office across treatment groups in the unincentivized Phase 1 (last row of Table C.3). Second, controlling for Phase 1 savings and baseline survey variables, including total savings, does not substantially alter the regression results. If anything, the estimated effect of sobriety incentives on savings becomes larger. Third, there is no apparent relationship between reported savings in the baseline survey and savings at the study office. Among the six individuals with total savings above Rs. 200,000 in the baseline survey, four were in the Choice Group, and two were in the Incentive Group.[19] Only two of them, both in the Choice Group, saved more than the average study participant over the course of the study.[20] However, their influence on the results below was negligible, in particular because these individuals already saved high amounts in the unincentivized Phase 1, which the regressions below control for. Accordingly, excluding these two individuals from the analysis does not change the conclusions of this paper.

Table C.4 shows balance of alcohol consumption at baseline. Only one of the 36 comparisons results in a statistically significant difference at the 10-percent level. Compared to the Control Group, individuals in the Choice Group reported somewhat lower alcohol expenditures per day.

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a reason for not owning a rickshaw is balanced across treatment groups. Other reasons for not owning a rickshaw included not having a safe place to store it or employers providing it.

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

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

[20]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, i.e. about the average amount in the Control Group.

4 Does Alcohol Consumption Affect Savings Decisions?

Time preferences are a fundamental aspect of decision-making. Savings can increase future consumption and serve as a buffer against adverse shocks, such as health emergencies. Accordingly, a growing body of recent research focuses on savings behavior among the poor and the impact of offering different savings accounts to low-income individuals in developing countries (Karlan et al. 2014). This literature largely centers 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 2013b). Less emphasis has been placed on determinants of savings behavior for given technologies and on heterogeneity in adoption or impact. This section presents evidence that acute alcohol intoxication distorts intertemporal choice and thereby causes self-control problems in savings decisions. In particular, I argue that increasing sobriety impacts savings behavior *beyond* effects on income net of alcohol expenditures. Section 5 complements this evidence by showing that sobriety incentives lower the impact of a commitment savings feature on savings, and vice versa.

As a first suggestive piece of evidence, Figure C.3 illustrates the strong correlation between daily amounts saved at the study office and blood alcohol content (BAC) measured during the same office visits, which holds both across Control Group participants and within the same individuals over time. That is, individuals who, on average, exhibited higher levels of sobriety also saved more. Moreover, individuals saved more during study office visits with lower levels of inebriation than the same individuals during high-inebriation visits. The remainder of this section considers whether this correlation reflects a causal impact of alcohol consumption on individuals' savings behavior. Understanding the causal impact of alcohol on savings behavior requires exogenous variation in sobriety. Therefore, I first consider the impact of financial incentives on alcohol consumption. While the outcomes in this section are of interest in and of themselves, they can also be viewed as a 'first stage' for the subsequent analysis of the impact of increased sobriety on savings decisions.

4.1 The Impact of Financial Incentives on Alcohol Consumption

Financial incentives significantly reduced daytime drinking, but they had only a moderate effect on overall drinking (Table 1). Both sobriety incentive treatments lowered daytime drinking, as measured by the fraction of individuals showing up sober, individuals' blood-alcohol content (BAC), and the reported number of standard drinks consumed before coming to the study office. The estimated treatment effects for the three measures correspond to an approximately one-third reduction relative to the mean in the Control Group. However,

this effect translated into only a moderate reduction in overall drinking. Reductions in self-reported consumption and expenditures were relatively small (about 5 to 10 percent decrease).[21] Finally, while larger in relative terms, the effect on reported abstinence is only moderate (2 percentage points) and not statistically significant.

4.1.1 The Impact of Incentives on Daytime Drinking

I use the fraction of individuals who arrived sober at the study office among *all* participants who were enrolled (as opposed to only among individuals who visited the study office) as the main measure to assess the impact of incentives on daytime drinking. That is, anyone who did not visit the study office on a particular day was 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 was lower than in the Control Group, this measure is preferable to other measures of sobriety as it less vulnerable to attrition concerns. Before discussing the treatment effects, it is worth noting that overall inebriation levels were high. Conditional on showing up at the study office, the average BAC in the Control Group was 0.09%, which exceeds the legal driving limit in most US states (0.08%).

Financial incentives significantly increased sobriety during the day, as measured by the fraction of individuals who visited the study office *and* had a zero breathalyzer test result among all individuals in the respective treatment groups (upper panel of Figure 3). In the pre-incentive period, there were only small differences in sobriety across treatment groups. In each group, about half of the individuals visited the study office sober on days 1 through 4. This fraction gradually declined in the Control Group over the course of the study to about 35 percent by the end of the study.[22] In contrast, with the start of the incentivized period (day 5), sobriety in the Incentive and Choice Groups increased by about 10 to 15 percentage points. Subsequent sobriety at the study office declined as well for these individuals in these two groups, but they remained about ten to fifteen percentage points more likely to visit the study office sober than the Control Group through the end of the study.

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 tracked each other even once individuals

[21] One reason why the relative impact of incentives on expenditures was somewhat larger than the impact on consumption is that we asked study participants about the former before the breathalyzer test, while they were asked about the latter after the breathalyzer test, which may have mitigated demand effects.

[22] The decline in sobriety in the Control Group over the course of the study is in part explained by the lower overall attendance in *all* treatment groups. In addition, individuals may have felt more comfortable visiting the study office inebriated or drunk at later stages of the study.

were given the choice of whether they wanted to continue receiving incentives at the beginning of Phase 3. The Incentive Group was only slightly more likely to visit the study office sober compared to the Choice Group in Phase 4. The similarity of drinking patterns in the Choice and Incentive Groups suggests sophistication regarding the effect of the incentives on individuals' sobriety. That is, the subset of study participants who would have increased their sobriety during study office visits if they had been provided with incentives also chose to receive the incentives when given the choice.

The corresponding regressions confirm the visual results (columns 1 through 6 of Table 1).[23] Individuals in the Incentive and Choice Group were approximately thirteen percentage points more likely to visit the study office sober (columns 1 and 2), which corresponds to a 33 percent increase compared to the Control Group. Conditional on visiting the study office, individuals' measured BAC in the Incentive Group was 2 to 3 percentage points lower than in the Control Group (columns 3 and 4), which represents a one-quarter to one-third decrease relative to the Control Group. Moreover, both treatments reduced the reported number of drinks before visiting the study office by about one standard drink from a base of just under three standard drinks (columns 5 and 6), which again corresponds to a reduction of about a third compared to the Control Group.

4.1.2 The Impact of Incentives on Overall Drinking

The estimated treatment effect on overall alcohol consumption is lower than the estimated effect on daytime drinking (columns 7 through 12 of Table 1). First, both treatments reduced reported overall alcohol consumption by about 0.3 standard drinks per day (columns 7 and 8), about a third of the effect on the reported number of drinks before coming to the study office as described above. None of these estimates are statistically significant. Second, the reduction at the extensive margin of drinking was small at best (columns 9 and 10). The point estimate for the pooled treatment effect suggests a 2-percentage point increase in reported abstinence from drinking altogether on any given day, but none of the estimates are statistically significant. Third, the treatment effect on reported overall alcohol expenditures is about Rs. 5 to 10 per day (columns 11 to 12), with a point estimate of Rs. 9.8 for the pooled treatment effect.

Taken together, these results 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 or not drinking at all. Figure 4 illustrates this point. The upper panel of the figure shows the evolution of individuals' number of drinks before coming to the

[23] All regressions in this table include controls for baseline survey characteristics and behavior in Phase 1. Tables C.5 and C.6 show additional regression specifications.

study office (lower part of the panel) and overall (upper part of the panel). While the incentives reduced drinking before study office visits significantly, the impact on overall drinking was small.[24] Consistent with these results, the incentives caused a shift in the distribution of the timing of individuals' reported first drink of the day (lower panel of Figure 4). About ten percent of the individuals in the Incentive and Choice Groups delayed the time of their first drink from between 10 am and noon to the evening. Importantly, however, individuals in the Incentive and Choice Groups did *not* arrive at the study office earlier than individuals in the Choice Group. In fact, on average, individuals in the Incentive Group visited the study office a few minutes later.

4.1.3 The Role of Differential Attendance

Differences in attendance across treatment groups did not cause the estimated effect of incentives on sobriety. Across all treatment groups and days of the study, attendance was high (lower panel of Figure 3). Attendance was 88.4 percent overall and 85.4 percent post treatment assignment. By construction, attendance in the lead-in period (Phase 1) was 100 percent. However, compared to the Choice and Control Groups, individuals in the Incentive Group were about 7 percentage points less likely to visit the study office post Phase 1. This attendance gap emerged with the start of sobriety incentives 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 on some days, and, hence, faced reduced incentives to visit the study office on those 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 were able to select out of them.

On average, the Incentive Group was 6 to 8 percentage points less likely to visit the study office compared to the Control Group (columns 1 through 3 of Table 2). Moreover, though not statistically significant, surprisingly, higher sobriety during the unincentivized Phase 1 *negatively* predicted subsequent attendance (column 4). This appears to be the case in the Incentive and Control Groups, but not in the Choice Group (column 5). Moreover, on average, participants with higher savings in Phase 1 exhibited significantly higher subsequent attendance (column 6). However, there is no evidence that the two treatments caused high savers to visit the study office more frequently. If anything, the opposite was the case (column 7), which suggests that differential attendance of high savers does *not* explain the savings patterns described below.

[24]Notably, overall drinking in the Control Group was already slightly higher on days 2 to 4, i.e. before the incentives to remain sober were assigned.

4.2 Did Increased Sobriety Change Savings Behavior?

Both sobriety incentive treatments increased savings at the study office (upper panel of Figure 5). Until day 4, when individuals learned their incentive-treatment status, average amounts saved were nearly identical across treatment groups. After the start of the incentivized period, individuals in the Incentive and Choice Groups saved 46 percent and 65 percent more 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). This 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 3 confirm the visual evidence. Individuals in both the Incentive and Choice Groups saved more at the study office, though only the coefficient for the Choice Group is statistically significant at the 10 percent level in the specification without controls (column 1). The pooled estimate shows a treatment effect of Rs. 12.45, which corresponds to an increase of 61 percent compared to Control Group savings of Rs. 20.42 (column 7). This estimate, as well as both individual estimates in column 1, is larger than the coefficients for both the high matching contribution and the commitment savings option. That is, the incentives for sobriety had a larger effect than increasing the matching contribution on savings from 10 to 20 percent, or introducing a commitment feature to the savings option.[25] Importantly, these estimates are intent-to-treat estimates, i.e. they measure the impact of *offering* incentives for sobriety. While only effective for a fraction of individuals, as shown above, sobriety incentives increased savings by 61% overall.[26]

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.

Pre-existing differences across treatment groups do not explain the observed differences in savings after day 4. The amounts saved by day 4 are nearly identical across treatment groups (upper panel of Figure 5). Moreover, controlling for Phase-1 savings and other controls, as well as for baseline survey variables only slightly alters point estimates

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

[26] Since BAC levels differed across treatment groups conditional on visiting the study office with a positive BAC, using the difference in the fraction sober to calculate a ToT is inaccurate.

while lowering standard errors, resulting in a point estimate for the pooled regression of Rs. 13.55 (columns 2, 3, and 9 of Table 3).

Differential study payments across treatment groups may have been responsible for the increase in savings in the two treatment groups. Indeed, the Choice Group received slightly higher study payments (Rs. 7 per day) compared to the Control Group (lower panel of Figure 5). However, the Incentive Group received in fact slightly *lower* study payments, which implies that differences in average study payments cannot explain higher savings in both treatment groups. Accordingly, controlling for study payments does not substantially alter the estimated treatment effects (columns 4 and 10 of Table 3). The estimate for the pooled treatment effect decreases slightly to Rs. 11.12 per day.

Differential attendance could be a cause of the increase in savings. However, as discussed in Section 4.1.3, while nearly identical in the Choice and Control Groups, attendance was in fact significantly *lower* in the Incentive Group (lower panel of Figure 3). In addition, if anything, the two treatments caused high savers to visit the study office *less* (column 5 of Table 2). Accordingly, restricting the sample to days when individuals showed up at the study office increases the estimated treatment effects (columns 5, 6, 11, and 12 of Table 3).

4.4 The Effect of Changes in Income Net of Alcohol Expenditures

The large impact of the sobriety incentives on individuals' savings patterns immediately raises the question of whether these impacts reflect changes in individuals' savings decisions for *given* resources. An alternative or complementary channel could be increased income net of alcohol expenditures, reduced overall alcohol expenditures, or increased earnings. This section considers the contribution of these channels to the increase in savings.

4.4.1 Estimating the Marginal Propensity to Save

Assessing the contribution of increased resources requires knowledge of the marginal propensity to save (MPS) out of additional resources. While somewhat underpowered, the lottery provides an estimate of the MPS.[27] Table C.7 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. The

[27]There are some additional concerns regarding the validity of the lottery as a way to estimate the MPS since some individuals early in the study won the lottery unusually often. However, excluding these individuals from the estimation in fact *reduces* the estimated MPS and therefore the contribution of mechanical effects to the savings results described above.

regressions also control for whether a lottery was conducted on the previous day with the participant. These regressions show a marginal propensity to save of 0.15 to 0.19 in the Control Group, and 0.28 to 0.40 in the pooled alcohol treatment groups. The calculations below use the estimate of the marginal propensity to save from the Control Group (0.19) in the preferred specification in column 6 of Table C.7.

4.4.2 The Effect of Reduced Alcohol Expenditures on Savings

Cycle-rickshaw peddlers spend a large fraction of their income on alcohol, on average, about Rs. 90 per day (Table C.4). Therefore, even relatively small reductions in alcohol consumption can significantly increase their overall resources. The above estimates 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. 10.7 per day (using the estimate from reported expenditures). Combining these estimates with the estimated marginal propensity to save from available resources of 0.19 in the Control Group (column 6 of Table C.7) implies that reduced alcohol expenditures accounted for Rs. 0.89 to Rs. 2.03 of the increase in savings.[28]

4.4.3 The Effect of Increased Earnings on Savings

In addition to reduced alcohol expenditures, the treatments may have affected available resources via increased earnings. Alcohol consumption has long been hypothesized to interfere with individuals' ability to earn income. 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, Fisher (1926) argued that drinking alcohol slowed down the "human machine." He also argued that industrial efficiency was one of the main reasons behind the introduction of alcohol prohibition in the US. 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.[29]

[28] I use the estimated marginal propensity from the Control Group because the purpose of this exercise is to understand the effect of increased resources for *given* preferences, i.e. under the null hypothesis of unchanged preferences.

[29] 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

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. 10.8 per day (columns 1 through 4 of Table 4). Taken at face value and combined with a marginal propensity to save of 0.19 as discussed above, this estimate implies that increased earnings due to the treatment account for Rs. 2.05 in increased savings. Similarly, the estimates on labor supply are relatively small and not statistically significant (columns 4 through 9 of Table 4). In fact, surprisingly, the estimates of the treatment effect on labor supply at the extensive margin (i.e. whether an individual worked at all on any given day) is negative (columns 4 through 6). In contrast, the estimates on hours worked overall are positive in most specifications (columns 7 and 9) though, again, none of them is statistically significant.

Importantly, the estimates from this paper do *not* imply that alcohol does not have profound effects on labor market outcomes for at least three reasons. First, the estimates in Table 4 are relatively imprecise. While large in relative terms, the impact of the incentives on daytime drinking was only moderate in absolute terms (13 percentage points). Therefore, I cannot rule out large effects of daytime drinking on labor market behavior. That is, a more powerful intervention to reduce daytime drinking may well cause much larger effects. Second, the impact of reduced drinking in the medium or long run might be much larger than the short-run effects considered in this paper. For instance, a cargo cycle-rickshaw peddler may need to build up a reputation as a reliable, sober driver to be able to receive more trips. Third, in my setting, the potentially negative impact of alcohol on productivity and labor supply due to reduced physical or cognitive function may have been mitigated by the analgesic effects of alcohol. However, this may not be the case in other settings.

4.4.4 Accounting for Mechanical Effects

Combining the estimates from the previous sections, it is now possible to assess the share of the increase in savings explained by mechanical effects. The starting point in this decomposition is the estimate of Rs. 11.03 for the overall pooled treatment effect in column 12 of Table 3 (which controls for study payments). From this estimate, I subtract the contribution of the two effects described above (using conservative estimates): (i) the contribution of reduced alcohol expenditures (Rs. 2.03), and (ii) the contribution of increased earnings (Rs. 2.05). This calculation leaves an unexplained treatment effect of Rs. 6.95, i.e. more than half of the overall treatment effect, and about one-third of savings in the Control Group. While

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).

not conclusive given the large standard errors of these estimates, these calculations provide evidence that increased sobriety indeed impacted savings behavior for *given* resources. Section 5 provides complementary evidence for this claim by showing that sobriety incentives and commitment savings are substitutes in their impact on saving.

4.5 Household Resources and Complementary Consumption

This subsection addresses two additional concerns regarding the above findings. First, the increase in savings at the study office due to increased sobriety may have come at the cost of reduced household resources. Such effects would be concerning since husbands often give resources to their wives as an implicit way to save money. Second, reduced alcohol consumption during the day or overall may have lowered expenses on complementary consumption goods such as tobacco.

4.5.1 Household Resources

The increase in savings due to the incentives treatments does not appear to have crowded out other resources available to individuals' families (Table C.8). In fact, while imprecisely estimated, I find that sobriety incentives *increased* money given to wives by about Rs. 17.5 (columns 4), a 11.7 percent change relative to the Control Group mean. However, resources spent on other family expenses decreased by about Rs. 7.5 (column 8) such that reported overall resources spent on family expenses increased by about Rs. 10.1 (column 12), again not statistically significant.

4.5.2 Food Expenditures and Complementary Consumption

While individual estimates vary, there is no systematic evidence of the incentives affecting expenditures on other goods (Table C.9). Expenses on food outside of the household as well as on coffee and tea remained nearly unchanged (columns 4 and 8). Of particular interest are expenses on tobacco products, as they are often thought of as complements to alcohol (Room 2004). However, there is no evidence of consistent impacts on these expenses either (columns 12). The lack of impact is perhaps not particularly surprising in light of the facts that reported expenditures on tobacco and paan products are low to begin with.[30] Moreover, the incentives reduced overall alcohol expenditures only moderately, therefore limiting the scope of effects through complementarities in consumption.

[30]Paan is a mixture of ingredients including betel leaf, areca nut, and often tobacco. Chewing paan is popular in many parts of India.

5 Are Sobriety and Commitment Savings Substitutes?

The structure of the experiment allows for an additional test of the hypothesis that increasing sobriety mitigates 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 intoxication reduces self-control, then increasing sobriety should lower the effect of commitment savings.

However, this simple intuition overlooks an additional, opposing effect. While commitment savings products may help individuals overcome self-control problems in future savings decisions by preventing them from withdrawing their savings prematurely, the immediate decision to save always requires incurring instantaneous costs. 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 of no self-control, the individual will not save regardless of the availability of a commitment option.

This section presents a simple model of a present-biased consumer as in Laibson (1997) to formalize this intuition. I then consider a specific case (iso-elastic utility) to demonstrate two features of this model. First, the impact of commitment savings is an inverse-U-shaped function in present bias for sophisticated individuals. The impact of commitment savings devices on savings is lowest for individuals without present bias ($\beta \approx 1$) and for the most present-biased individuals ($\beta \approx 0$). Thus, 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).[31] Second, for the empirically relevant parameter range of $\beta > 0.5$, an increase in β lowers the impact of commitment savings on savings. Therefore, a decrease in the impact of commitment savings due to increased sobriety, as demonstrated in Section 5.2, can be viewed as evidence for increased self-control due to increased sobriety.

5.1 A Simple Model

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

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

and 3, but the consumer is paid a matching contribution of M times the amount saved by the 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.

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

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

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

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

and Laibson 2001):[32]

$$u'(c_1) = \left[\beta \frac{dc_2}{dY_2} + \left(1 - \frac{dc_2}{dY_2}\right)\right] u'(c_2). \tag{9}$$

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. The Period 1 self would like to set $u'(c_2) = (1+M)u'(c_3)$. However, in the absence of commitment savings, the 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 the Period 1 self would like him to. This creates a demand for commitment for the 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. The individual will consume c_1 and deposit 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:

$$u'(c_1) = \beta u'(c_2), \tag{10}$$

$$u'(c_2) = (1+M)u'(c_3), \tag{11}$$

$$c_3 = (Y_2 - c_2)(1+M). \tag{12}$$

Comparing the two solutions above clarifies the relationship between present bias and commitment savings. Introducing a commitment option increases savings iff $0 < \beta < 1$, since 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 as there is no discrepancy between the Period 1 and Period 2 preferences. At the other extreme, if $\beta \to 0$, there are no savings even if commitment is available such that there is no impact of the commitment device on savings choices either.[33] Taken together, this implies that the impact of commitment savings is non-monotonic in present bias.

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 effect not only reduces the Period 2 self's savings for given resources, but it also reduces the 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

[32] 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.

[33] Subsistence levels in consumption could change this feature of the model.

desired amount using the commitment device. Hence, the 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 the 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 effect *lowers* the impact of offering the commitment savings option. In the extreme case for $\beta \to 0$, there is no impact at all.

Solving for the iso-elastic case. Consider the case of the commonly used iso-elastic utility function.

$$u(c_t) = \begin{cases} \frac{c_t^{1-\gamma}}{1-\gamma} & \text{if } \gamma \neq 1, \\ \log(c_t) & \text{if } \gamma = 1. \end{cases} \tag{13}$$

The impact of commitment savings on savings is given by the difference in consumption levels in Period 3 with and without commitment (see Appendix Section C.1 for details).

$$\Delta \equiv c_3^{\mathrm{C}} - c_3^{\mathrm{NC}} = \frac{Y_!(1+M)}{1+\theta+\theta\left[\frac{1+\beta\theta}{1+\theta}\right]^{\frac{-1}{\gamma}}} - \frac{Y_1(1+M)}{1+\theta+(1+M)^{1-\frac{1}{\gamma}}}. \tag{14}$$

Figure C.4 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.[34] 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.

5.2 Empirical Evidence

The cross-randomization of sobriety incentives and commitment savings allows me to investigate whether the two interventions are substitutes or complements in their impact on savings. Consistent with alcohol intoxication increasing present bias, Figure 6 provides evidence of the latter. The figure depicts cumulative savings by the (pooled) sobriety treatment and the cross-randomized savings conditions.[35] In the upper panel of the figure, 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

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

[35] The two sobriety treatments are pooled solely for expositional purposes. The equivalent graphs without pooling the sobriety treatment groups show only very minor differences in savings behavior between the Incentive and Choice Groups (Figure C.5).

cross-randomized commitment savings feature.[36] Cumulative savings for the four groups were nearly identical through the pre-incentive period until day 4, and throughout the study, three of the four lines in the graph remain nearly indistinguishable. However, the group that received neither commitment savings nor the alcohol treatment (as represented by the green line with solid circles) saved distinctly less than each of the remaining groups subsequently. While both incentives for sobriety and the commitment savings option had a large impact on savings, being assigned to both of these treatments did not further increase savings.

The differences across treatment groups were due to differences in both deposits and withdrawals (Figure 7). Compared to the group with neither incentives for sobriety nor commitment savings, sobriety incentives and commitment savings each on their own increased deposits (upper panel), and reduced withdrawals (lower panel). 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.

Table 5 shows regressions corresponding to Figure 6. While somewhat underpowered, the estimated interaction effect between sobriety incentives and commitment savings is consistently negative and about the same size as the estimated impact of sobriety incentives and commitment savings on their own (columns 1 through 3). In contrast, though negative as well, the interaction between sobriety incentives and the matching contribution treatment are much smaller in magnitude (columns 4 through 6).

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 reducing alcohol consumption mitigates the need for commitment savings. However, given that the intervention only moderately reduced overall alcohol consumption and expenditures, this channel is unlikely. A second competing explanation could be that there was an upper bound of how much individuals were able to or wanted to save. However, average daily savings were well below the savings limit of Rs. 200 per day. Moreover, during the course of the study, all individuals received relatively large study payments in addition to their earnings outside of the study, which appear to have been largely unaffected by the study. Accordingly, the majority of individuals would have been able to increase their savings if they had preferred to do so. Consistent with this interpretation, increasing the matching contribution rate did *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 6).

[36]For instance, the blue line with squares shows cumulative savings for individuals who were not offered incentives for sobriety, but who were given the commitment savings options.

6 Do Individuals Want to Reduce Their Drinking?

Given the considerable short-run and longer-run costs of alcohol consumption, a natural question to ask is whether individuals are aware of these costs. In particular, if these costs exceed the benefits of drinking, why are individuals not reducing their consumption? This section considers the extent to which self-control problems contributed to individuals' demand for receiving incentives for sobriety. 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, *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 changed their choices over time and whether receiving incentives in earlier phases of the study affected individuals' demand for commitment. During each choice session, individuals chose their incentive structure for the subsequent six study days.[37]

Many study participants demanded incentives, even when choosing incentives entailed a potential (Choice 2) or certain (Choice 3) reduction in study payments (upper panel of Figure 8 and Table C.11). About one-third of individuals in the Choice Group preferred sobriety incentives over receiving Rs. 150 regardless of their breathalyzer scores, and in each week, about half of the individuals chose incentives over receiving Rs. 120 unconditionally. Setting aside potential impacts of the incentives on attendance, 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 for one week each.

The high demand for incentives does not appear to be the result of misunderstandings. During each choice session, surveyors spent considerable time and efforts ensuring participants' sound understanding of the choices faced. Comprehension questions and further clarifications as needed then solidified comprehension before participants engaged in their

[37] Attrition and inconsistencies of decisions during the choice session cause relatively minor concerns for the analysis below (Table C.10). In the Choice Group, less than 7 percent of individuals missed their choices in any given week, and, in each week, less than 7 percent of individuals stated inconsistent preferences. Furthermore, over 88 percent of all study participants completed the endline choices with consistent choices. This fraction varies only slightly across treatment groups (90.1 in the Incentive Group and 88.0 in the Choice Group vs. 86.7 in the Control Group). In an attempt to be conservative regarding the demand for commitment in Figure 8 and Table C.11, an individual was counted as not choosing incentives in any given choice if he did not attend the respective choice session or if he attended, but made inconsistent choices. The regressions in Tables 6 and 7 are conditional on attendance. The analysis is robust to alternative specifications.

choices. Moreover, if participants were making simple 'trembling hand' mistakes during their first choice session, one would expect subsequent demand for incentives to decrease over time as participants learned the (potentially negative) consequences of their choices. Instead, if anything, the fraction of individuals choosing sobriety incentives *increased* slightly over time. Finally, while somewhat overconfident on average, individuals' beliefs regarding their future sobriety under incentives were fairly accurate on average, in particular in the second half of the study (Figure C.6).

Subjects' choices provide evidence of high prevalence of self-control problems as well as awareness of these problems. In particular, the fraction of individuals who exhibited demand for *costly* commitment was larger than found previously in most of other settings. A growing literature demonstrates demand for commitment in a number of domains ranging from smoking to exercising and real efforts tasks.[38] However, with the exceptions of Beshears et al. (2015) and Milkman et al. (2014), there is little existing evidence that individuals are willing to pay for commitment beyond the potential costs of failing to achieve the behavior they are committing to.[39] In contrast, about a third of study participants made choices that implied significant losses in study payments even in the best case of visiting the study office sober every day.

This unusually high demand for commitment might be explained by a number of factors. First, many of the individuals in my sample had been drinking alcohol for many years and their beliefs regarding their future drinking were fairly sophisticated. Second, many individuals expressed a strong desire to reduce their drinking in surveys and informal conversations. These men had spent substantial shares of their incomes on alcohol every day for many years before participating in the study. Compared to these expenses, the foregone study payments due to the commitment choices may have appeared relatively small to individuals, especially if they implied a positive (perceived) chance of reducing subsequent alcohol consumption in the medium or long run. Third, by the design of the study, individuals had been given experience with the incentives before making their choices, similarly to, for instance, study

[38]For instance, Ashraf et al. (2006) and Beshears et al. (2015) on commitment savings; Gine et al. (2010) on smoking cessation; Kaur et al. (2015) on self-control in the workplace; Ariely and Wertenbroch (2002), Augenblick et al. (2015), and Houser et al. (2010) on effort tasks; and Royer et al. (2014) and Milkman et al. (2014) for gym attendance. See Bryan et al. (2010) and Augenblick et al. (2015) for overviews.

[39]A large number of studies in the psychology literature have associated excessive alcohol consumption with survey measures of (lack of) self-control, behavioral under-control, and susceptibility to temptation (Hull and Slone 2004). In addition, the existence of and demand for disulfiram (Antabuse) can be viewed as evidence of self-control problems causing alcohol consumption (Glazer and Weiss (2007), Bryan et al. (2010)). However, evaluations of disulfiram treatment for alcohol dependence have shown inconsistent findings, in large part because of low treatment adherence as in Fuller et al. (1986). Studies evaluating incentives to increase compliance (O'Farrell et al. 1995) and a combination of disulfiram with other medications to reduce cravings or withdrawal symptoms such as naltrexone or acamprosate have found more promising results (Suh et al. 2006), but do not necessarily show evidence of demand for commitment and, hence, self-control problems.

participants in Kaur et al. (2015). This previous exposure may have impacted the demand for incentives and commitment as investigated from a theory perspective by Ali (2011). Fourth, commitment contracts were implicitly defined via choices of different structures of study payments rather than asking individuals explicitly whether they were willing to give up money that they earned in the labor market on their own. As a result, individuals may have perceived their choices as decisions between various gains rather than considering potential losses in study payments due to commitment choices.

Social desirability bias may have also contributed to individuals' demand for commitment. However, while it is impossible to rule out this explanation altogether, the high stakes and the repeated elicitation of choices over time mitigate such concerns. Moreover, the demand for incentives exhibits reassuring patterns that are hard to explain by social desirability bias (Table 6). First, sobriety during the choice strongly and consistently predicts demand for incentives.[40] Second, individuals beliefs regarding the of future sober study office visits strongly predict demand for incentives. Third, individuals in the Choice Group who visited the study office sober more often in the incentivized Phase 2 (study days 5 through 7) were subsequently more likely to choose incentives for all three unconditional amounts. This relationship is not particularly surprising since the expected study payments from choosing incentives were higher if a study participant was more likely to visit the study office sober. Fourth, 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 relationship is reassuring since individuals should have chosen 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.

Exposure to incentives for sobriety increased the demand for the incentives (lower panel of Figure 8). For all three choices, the Incentive Groups were more likely to choose incentives than the Control Group. The fraction of individuals choosing incentives in the Choice Groups (on day 20) was in between the corresponding fractions in 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 7). These differences are not explained by differences in sobriety while making these choices or by differences in expectations of future sobriety under incentives. Before preferences were elicited, individuals were asked how often they expected to visit the study office sober if they

[40]This relationship could reflect the fact that acute alcohol intoxication directly influenced individuals' choices, but it might also simply reflect the fact that incentives worked better for individuals who visited the study office sober (since they were already incentivized when making their choices).

were to be given incentives for sobriety. Reassuringly, subjects' beliefs about their expected sobriety under incentives strongly predicts demand for incentives. Finally, again, higher sobriety during the time of choosing predicts a higher probability of choosing incentives.

The above findings raise the question of why so many study participants exhibited the demand for commitment despite the fact that overall drinking only fell moderately. Several, not mutually exclusive explanations are possible. First, the above estimates suggest that incentives for sobriety caused several small benefits which taken together may well exceed Rs. 30. Importantly, all of these ITT estimates reflect average effects of incentives, which mask potentially important heterogeneity in impacts. On average, though not statistically significant, sobriety incentives increased reported earnings by about Rs. 10.8 and reduced reported alcohol expenditures by about Rs. 8.5. As shown above, sobriety incentives increased savings significantly and may have also affected other decisions. Moreover, individuals may have valued daytime sobriety on its own despite potentially increased disutility of work due to exacerbated physical pain. Second, partial naïveté may have contributed to the demand for commitment. On the one hand, underestimating the extent of their self-control problems due to partial or full naïveté as in O'Donoghue and Rabin (1999) may lower the demand for (costly) commitment by decreasing the perceived benefits of commitment (Laibson 2015). On the other hand, partial naïveté can also increase the demand for commitment by causing individuals to overestimate the effectiveness of commitment devices in overcoming their self-control problems.[41] In the context of my study, while aware of their own self-control problems, some individuals may have underestimated these self-control problems or overestimated the usefulness of the incentives for sobriety in reducing their daytime or overall drinking.

However, while impossible to rule out that partial naïveté contributed to the demand for incentives, there are reasons to believe that individuals' incentive choices were fairly sophisticated and perhaps more so than found in other settings such as in Augenblick and Rabin (2016). First, as described above, individuals' beliefs regarding their future sobriety (when incentivized) during study office visits were fairly accurate on average.[42] Second, as also discussed above, the ITT estimates on sobriety are very similar for the Incentive and Choice Groups. Accordingly, the local average treatment effect for those who take up the incentives voluntarily in the Choice Group (i.e. the compliers) was larger than the average treatment effect in the overall study population.[43] This fact in turn implies some

[41]For a more detailed treatment of this argument and an application in the savings domain, see John (2015).

[42]Unfortunately, individuals were only asked how often they thought they would visit the study office sober if they received incentives in the future, but not in the absence of receiving incentives.

[43]This calculation assumes that the act of choosing the incentives did not alter their effectiveness.

sophistication on behalf of the study participations regarding the impact of the incentives. In particular, it implies that the individuals with the largest treatment did *not* select out of the incentives.

7 Conclusion

This paper provides evidence that self-control problems may not only cause undesired alcohol consumption, but that alcohol itself can exacerbate present bias, and therefore create further self-control problems in other domains. In my experiment, increased sobriety is associated with stark increases in individuals' savings during their study office visits. This increase appears to not have been the result of mechanical effects from increased income net of alcohol expenditures, but due to lowered self-control problems in savings decisions as a consequence of decreased myopia. Taken together, these results imply that effective commitment devices for sobriety not only help individuals reduce undesired alcohol consumption, but may also lessen *other* self-control problems caused by alcohol. More generally and more speculatively, the results suggest that alcohol intoxication changes decision processes in a way that may reinforce poverty.

A significant fraction of low-income workers in a large Indian city were willing to sacrifice money for commitment to increase sobriety during the day, indicating a greater awareness of and willingness to overcome self-control problems than found in most other settings. Future work may explore the underlying reasons for this high demand (e.g. physical pain) and the differences to other settings. Moreover, it remains to be investigated whether modified commitment contracts are able to help individuals reduce their overall drinking if they so desire. A key aspect of such contracts might be better and more continuous (self-)monitoring using novel technologies such ankle monitoring devices as, for instance, described in Kilmer et al. (2013).[44]

Before considering concrete options, a key first step toward improved policymaking will be to collect higher-quality and more systematic data on alcohol consumption patterns in developing countries. Such data would include more frequent measurements (e.g. daily data) and as well as data on intoxication levels (e.g. breathalyzer scores) in addition to more detailed consumption patterns. These data could then be used to assess the consequences of different policies intended to reduce drinking as well as to understand the impact of alcohol consumption on labor market outcomes, decision-making, family outcomes, and poverty.

[44]For instance, ankle-monitoring devices that measure individuals' intoxication via their sweat can provide reliable measurements at high frequencies. Of course, the impact of using monitoring devices might be very different if they are used in strictly voluntary programs (compared to involuntary programs with DUI offenders).

The high prevalence of self-control problems suggests that "sin taxes" could be an attractive policy option (Gruber and Kőszegi 2001; O'Donoghue and Rabin 2006). Given the negative correlation of alcohol consumption and income, such taxes may be regressive. However, the regressiveness of taxation may be mitigated if consumers have self-control problems. Gruber and Kőszegi (2004) show that "sin taxes" can even be progressive (in particular in the utility domain) if poor individuals are more price-elastic and/or are more present-biased compared to rich individuals. The results from my study suggest that the regressiveness of taxing alcohol may be further lessened by effects of reduced drinking on earnings and savings. Nevertheless, given that the price elasticity of the demand for alcohol in this setting is below unity, increasing taxes would further reduce individuals' – and therefore many families' – already low income net of alcohol expenditures, unless the effects of reduced drinking on earnings turn out to be particularly large.[45] However, complementary policies, for instance unconditional cash transfer programs, may be able to mitigate such unintended adverse consequences.

A second, more extreme policy option could be prohibition, as already implemented in several Indian states such as Gujarat or Bihar. Prohibition may be a particularly attractive policy option for India and other developing countries compared to developed countries since the distribution of alcohol consumption is heavily skewed, with the majority of the population abstaining from alcohol and a relatively large share among the drinkers consuming alcohol excessively. However, enforcement of prohibition is known to be difficult and may result in other unintended consequences such as organized crime and corruption (Thornton 1991). Moreover, many Indian state governments heavily depend on excise taxes, which makes the implementation of prohibition difficult. Given these concerns, second-best policies aimed at reducing the costs of inebriation by shifting critical decisions away from drinking times could be welfare-improving even if they do not change overall drinking levels.

[45] In most other studies, the price elasticity of alcohol consumption has been found to be below unity, and heavy drinkers' price response tends to be particularly small (Manning et al. 1995). For an overview, see Wagenaar et al. (2009).

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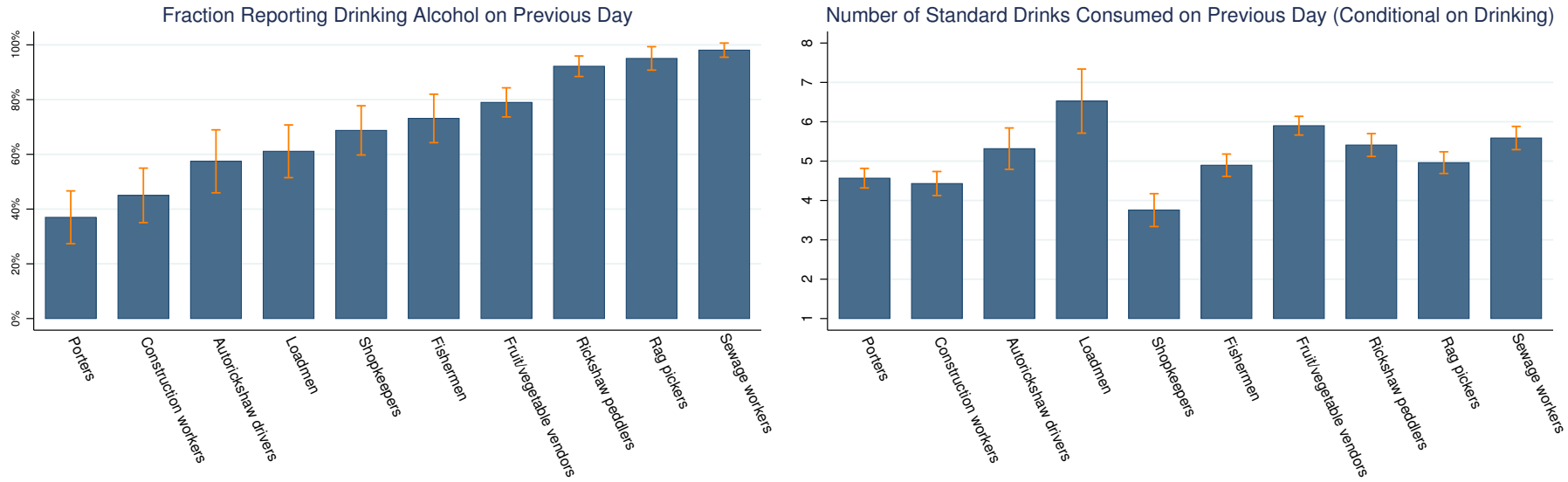
A Figures

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

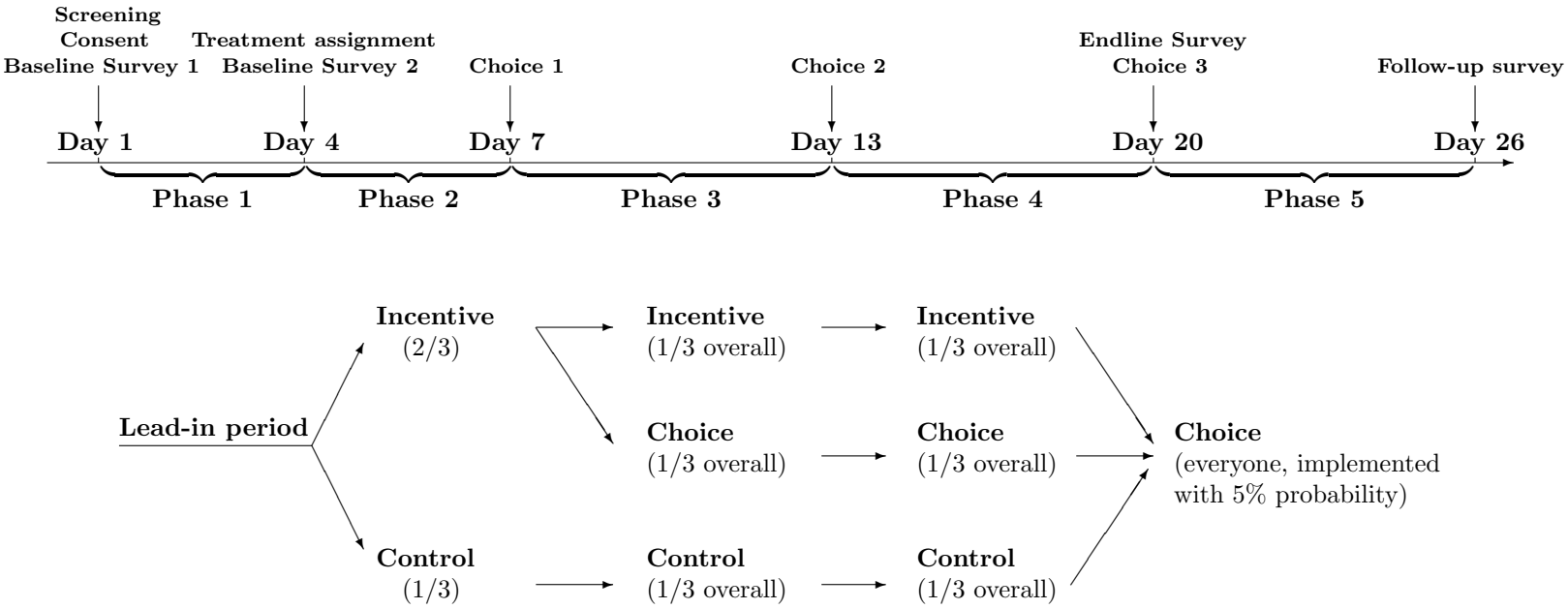


Notes: The figure shows summary statistics of drinking patterns for ten different low-income professions in Chennai, India. The underlying data from these figures are from short surveys conducted with a total sample size of 1,227 individuals. The number of individuals surveyed in each profession varies from 75 (auto rickshaw drivers) to 230 (fruit and vegetable vendors). Error bars measure 95 percent confidence intervals.

1. The left panel depicts the prevalence of alcohol consumption, as measured by the fraction of individuals who reported consuming alcohol on the previous day.

2. The right panel shows the number of standard drinks consumed on the previous day, conditional on reporting any alcohol consumption on the previous day. 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.

Figure 2: Experimental Design



Notes: This figure gives an overview of 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 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).

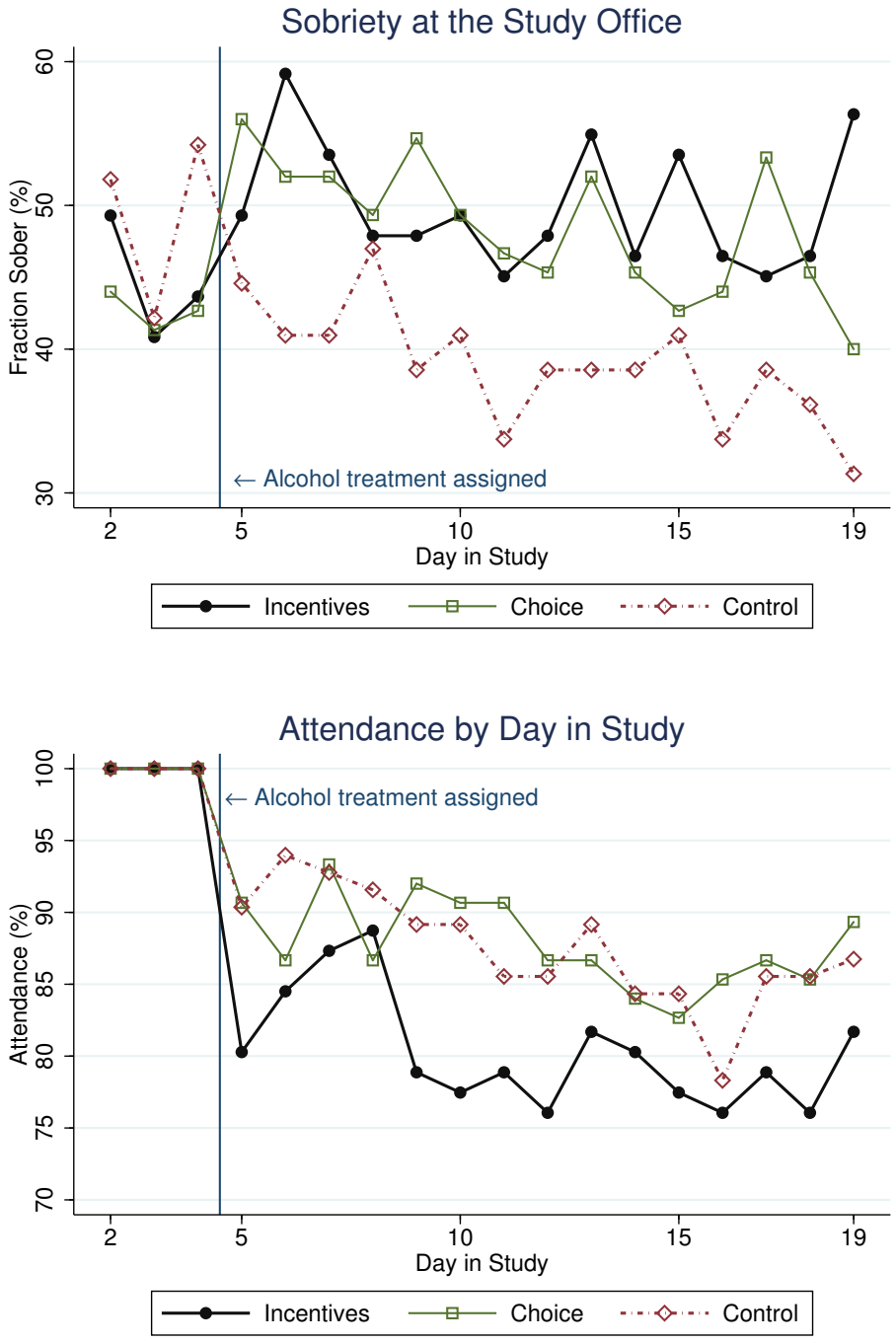
   (ii) Study payments for the Incentive Group depended on the breathalyzer score starting with day 5 of the study (Rs. 60 if BAC > 0, Rs. 120 if BAC $= 0$).

   (iii) After facing the same payment schedule as the Incentive Group in Phase 2, 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 participate in 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 3: Sobriety and Attendance by Alcohol Incentive Treatment Group

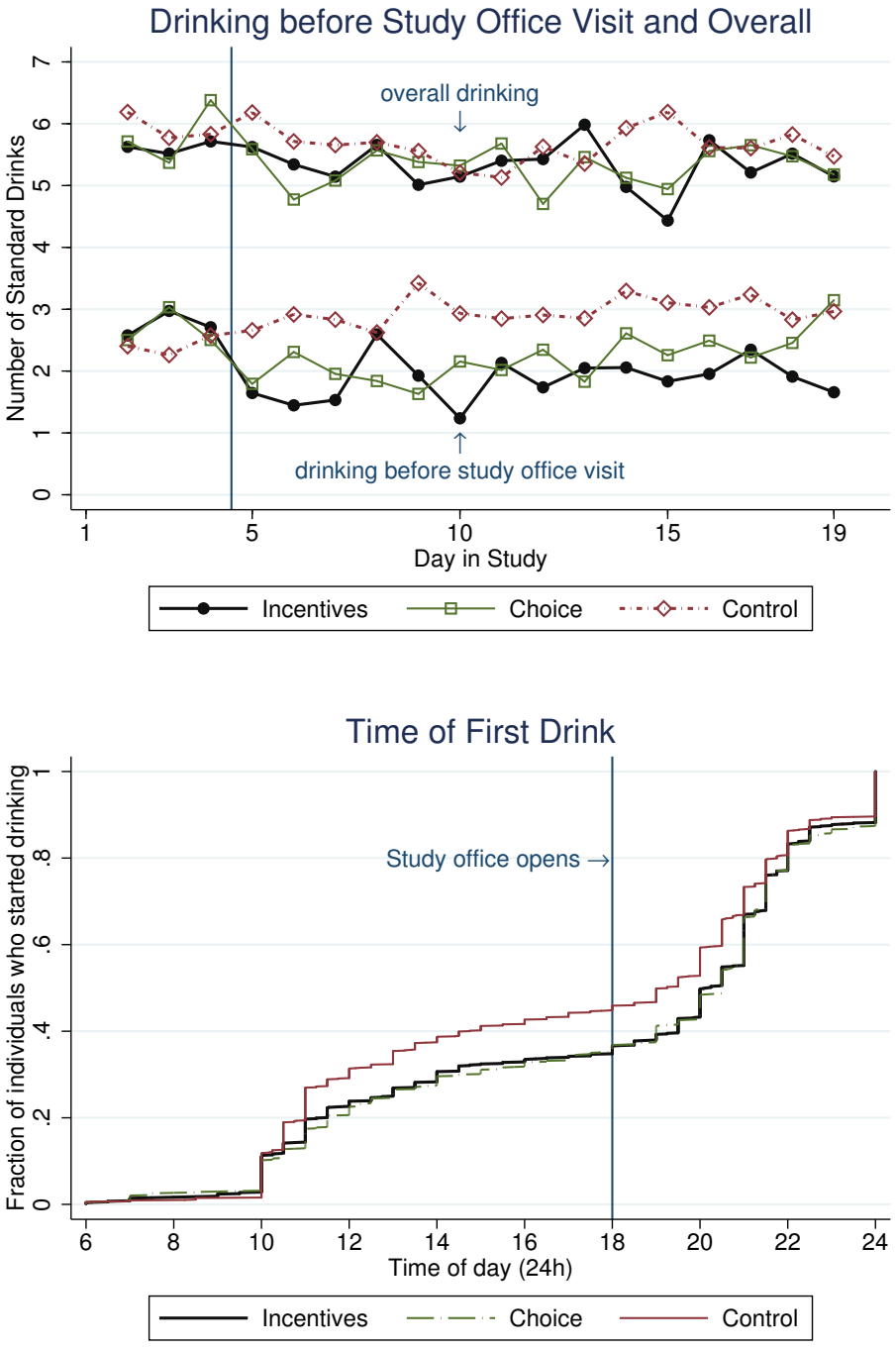


Notes: This figure shows sobriety and attendance by study day for the three sobriety incentive treatment groups.

1. The upper panel of this figure shows the fraction of individuals who visited the study office sober. 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. Accordingly, on any given day, the variable takes on the value '0' for individuals who visited the offices, but had a positive breathalyzer test score and for individuals who did not visit the study office on that day.

2. The lower panel of the figure shows the fraction of individuals who visited the study office. Since only individuals who came to the study office on days 2 through 4 were fully enrolled in the study, by construction, attendance is 100 percent on days 2 through 4.

Figure 4: Timing of Alcohol Consumption by Alcohol Incentive Treatment Group

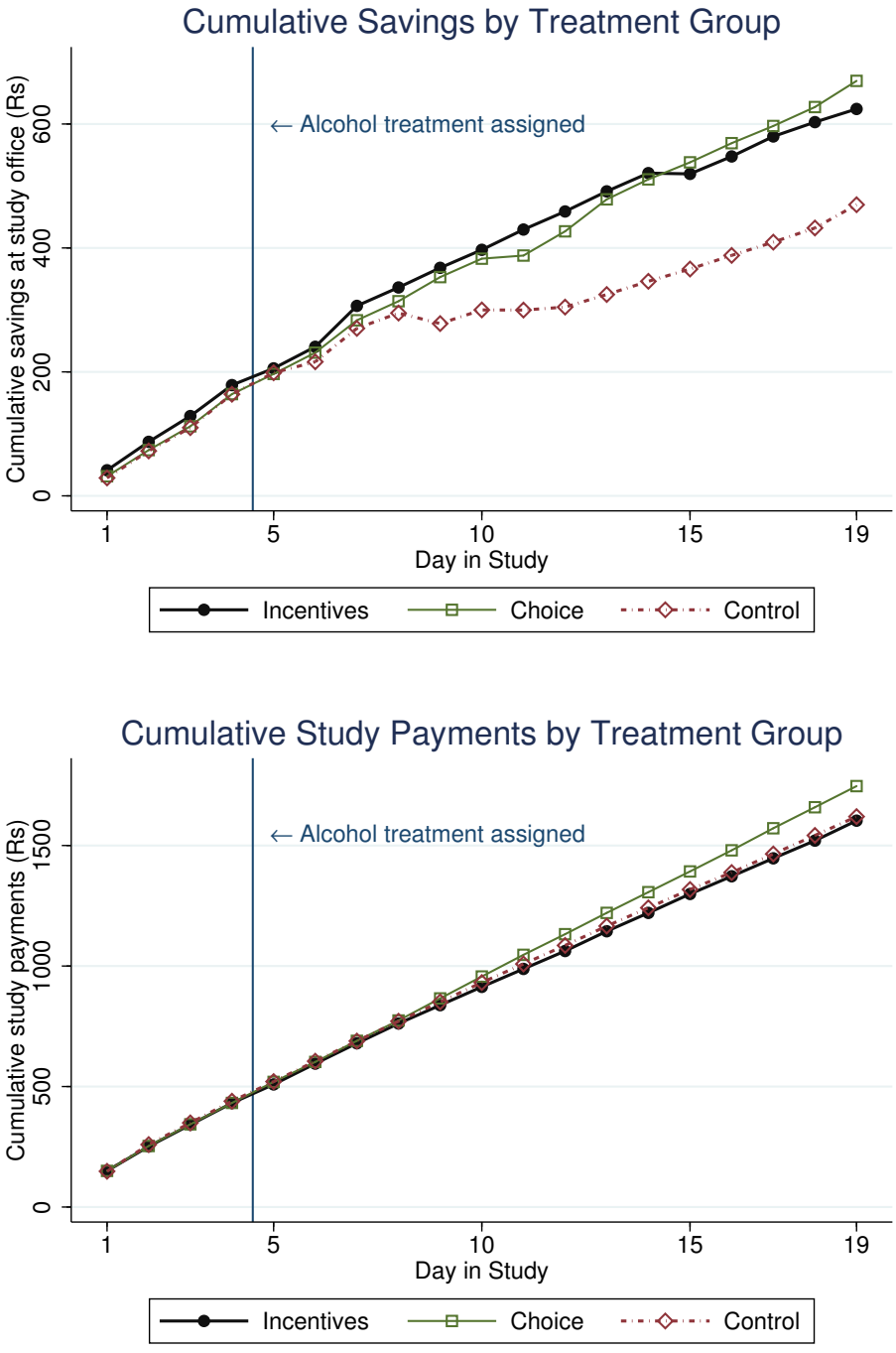


Notes: This figure illustrates the shift in the timing of alcohol consumption induced by the treatment.

1. The upper panel of the figure shows the self-reported number of standard drinks consumed before the study office visit and the overall number of standard drinks consumed per day.

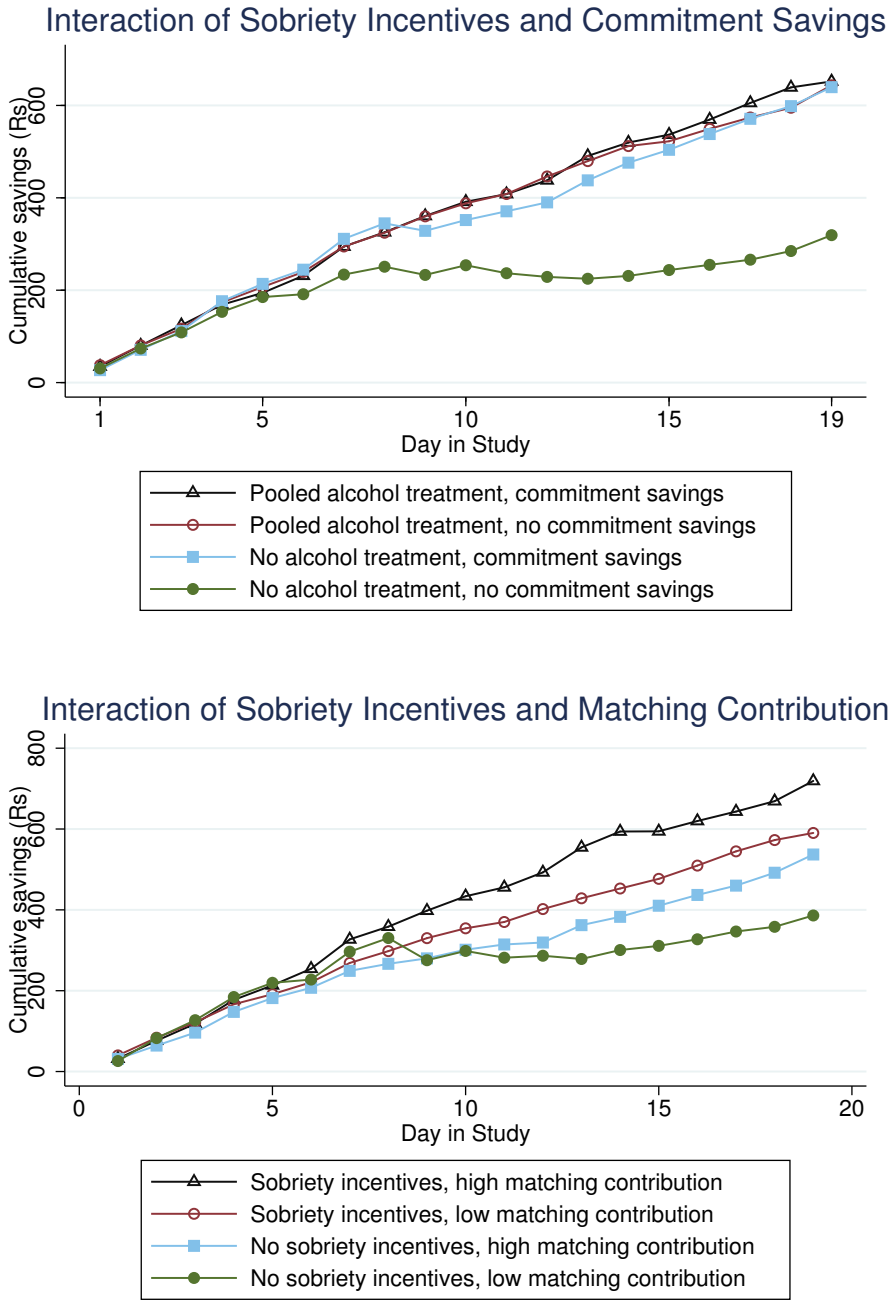
2. The lower panel shows the cdf of individuals' reported time of their first drink on any given day.

Figure 5: Cumulative Savings by Day in Study



Notes: This figure depicts subjects' cumulative savings at the study office (upper panel) and cumulative study payments (lower panel) by alcohol incentive treatment group.

Figure 6: 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),

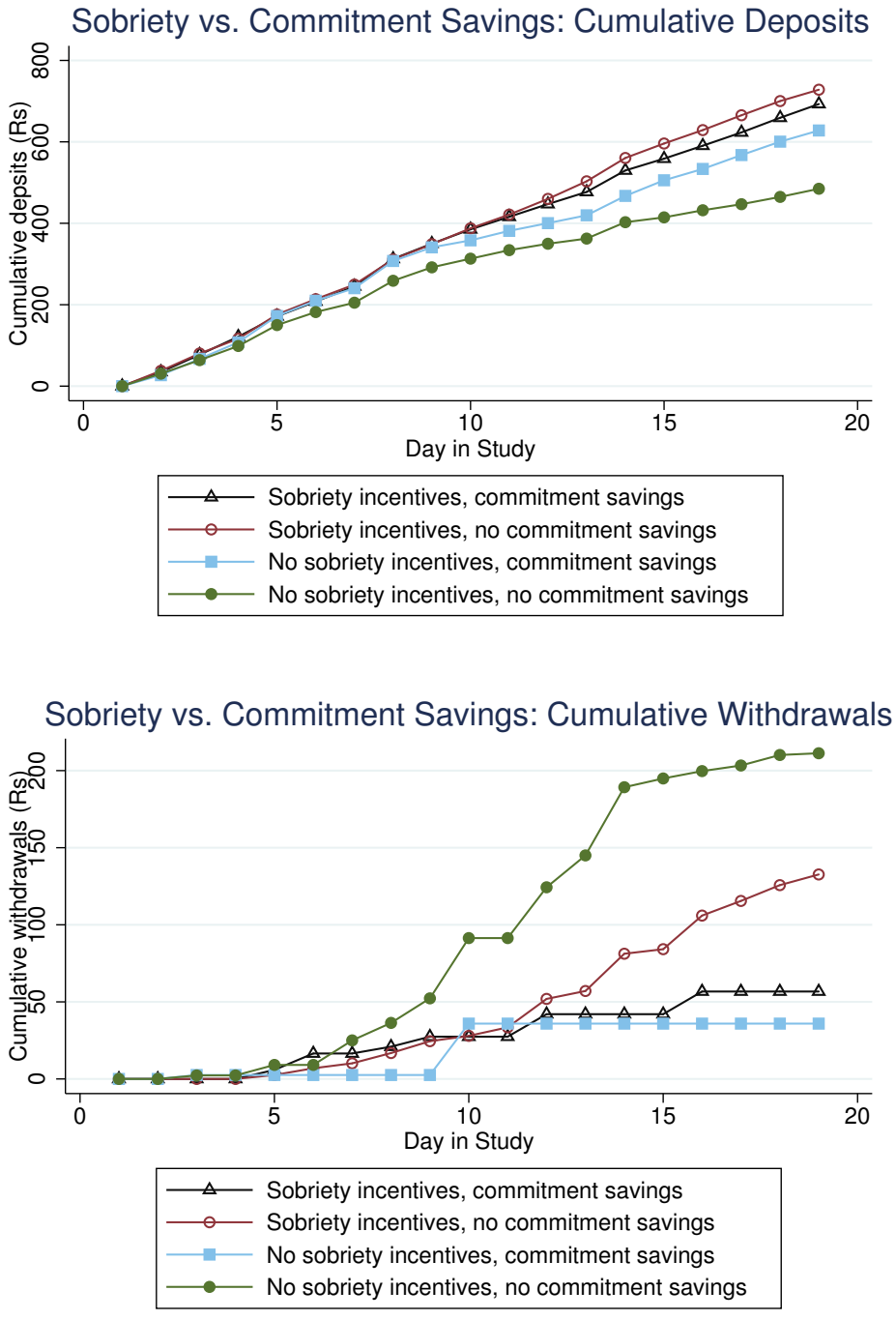
(ii) no sobriety incentives, but commitment savings (blue line with squares),

(iii) sobriety incentives, but not commitment savings (red line with hollow circles), and

(iv) both sobriety incentives and commitment savings (black line with triangles).

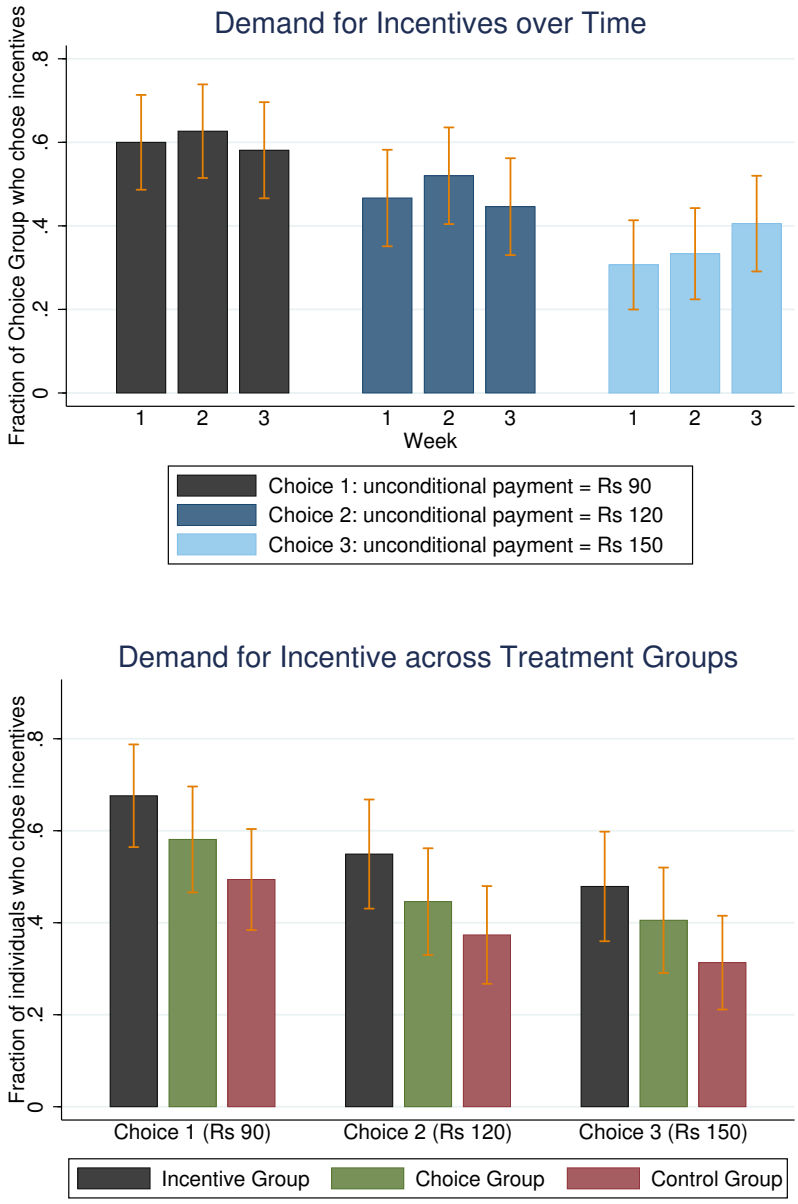
The lower panel of the figure shows the equivalent graph for the interaction between receiving sobriety incentives and a matching contribution (20 percent instead of 10 percent on the amount saved by day 20).

Figure 7: Sobriety Incentives vs. Commitment Savings: Deposits and Withdrawals



Notes: This figure splits up the results shown in the upper panel of Figure 6 into cumulative deposits (upper panel) and cumulative withdrawals (lower panel).

Figure 8: Choices Across Treatment Groups and Over Time



Notes: This figure depicts the fraction of individuals who preferred incentives for sobriety over unconditional payments.

1. All choices were made for the subsequent six study days. Under incentives for sobriety, if an individual visited the study office, he received Rs. 60 ($1) if his breathalyzer score was positive, and Rs. 120 ($2) if his breathalyzer score was zero.

2. Unconditional payments are Rs. 90 (Choice 1), Rs. 120 (Choice 2), and Rs. 150 (Choice 3). Hence, an individual exhibited demand for commitment to sobriety if he chose incentives in Choices 2 and/or 3. During each of the choice sessions, individuals made all three choices before one of these choices was randomly selected to be implemented.

3. If an individual did not complete the set of choices, or if he chose inconsistently, the observation is counted as *not* preferring incentives. During a given choice session, an individual chose inconsistently if he chose Option B for the unconditional amount Y_1, but Option A for the unconditional amount Y_2 with $Y_2 > Y_1$.

4. 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 1: The Effect of Incentives on Sobriety Before and During Study Office Visits

	Drinking before study office visit						Overall drinking					
Dependent variable:	**Sober at study office**		**Blood-alcohol content**		**#drinks before visit**		**#drinks overall**		**No drink at all**		**Alcohol expenses (Rs.)**	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Incentives	0.12		-0.03		-1.08		-0.33		0.02		-9.33	
	(0.045)		(0.008)		(0.256)		(0.256)		(0.029)		(4.736)	
Choice	0.13		-0.02		-0.88		-0.30		0.02		-10.14	
	(0.041)		(0.008)		(0.246)		(0.271)		(0.028)		(4.309)	
Pooled alcohol treatment		0.13		-0.02		-0.97		-0.32		0.02		-9.77
		(0.038)		(0.007)		(0.214)		(0.225)		(0.024)		(3.987)
Observations	3,435	3,435	2,932	2,932	2,929	2,929	2,932	2,932	2,930	2,930	2,932	2,932
R-squared	0.292	0.291	0.441	0.440	0.315	0.315	0.175	0.175	0.065	0.065	0.178	0.178
Baseline survey controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Phase 1 controls	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Control group mean	0.389	0.389	0.0910	0.0910	2.960	2.960	5.650	5.650	0.105	0.105	90.89	90.89

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

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. Standard errors are in parentheses, clustered by individual.

2. The outcome variable in columns 1 and 2, 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 3 through 12 are conditional on visiting the study office. Columns 3 and 4 consider individuals' measured blood alcohol content from a breathalyzer test. Columns 5 and 6 consider the reported number of drinks *before* visiting the study office on any given day. Columns 7 and 8 show impacts on the overall number of drinks on any given day. Columns 9 and 10 consider abstinence, instances of no drinking at all on any given day. Columns 11 and 12 show reported daily expenditures on alcohol consumption.

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 control variables are baseline survey variables shown in Tables A.1 through A.3.

Table 2: The Effect of Incentives on Attendance

	Dependent variable: present at study office						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Incentives	-0.07	-0.08	-0.06	-0.07	-0.08	-0.08	-0.06
	(0.043)	(0.043)	(0.040)	(0.043)	(0.053)	(0.042)	(0.069)
Choice	0.00	0.00	0.02	0.00	-0.05	0.00	0.04
	(0.036)	(0.034)	(0.035)	(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	3,435	3,435
R-squared	0.009	0.016	0.094	0.011	0.015	0.025	0.027
Baseline survey controls	NO	NO	YES	NO	NO	NO	NO
Phase 1 controls	NO	YES	YES	NO	NO	NO	NO
Control group mean	0.875	0.875	0.875	0.875	0.875	0.875	0.875

Notes: This table shows regressions of daily attendance at 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 variable for whether an individual visited the study office on a given study day when he was supposed to.
3. Standard errors are in parentheses, clustered by individual. Phase 1 and baseline survey controls are the same as in the above tables.

Table 3: The Effect of Sobriety Incentives on Savings at the Study Office

	Dependent variable: amount saved at study office (Rs./day)											
	Incentive and choice treatments separately						**Pooled sobriety incentive treatments**					
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Incentives	10.10	8.81	10.18	9.61	12.63	8.53						
	(7.555)	(6.586)	(6.778)	(6.540)	(7.069)	(6.852)						
Choice	14.71	16.81	16.55	12.51	19.17	13.46						
	(7.772)	(5.705)	(5.898)	(5.725)	(6.407)	(6.394)						
Pooled alcohol treatment							12.45	12.99	13.55	11.12	16.16	11.13
							(6.262)	(5.243)	(5.390)	(5.240)	(5.694)	(5.576)
High matching contribution	9.40	9.64	11.26	12.21	14.48	13.60	9.29	9.59	11.25	12.21	14.31	13.46
	(6.534)	(4.868)	(5.017)	(4.790)	(5.407)	(5.254)	(6.532)	(4.888)	(5.005)	(4.780)	(5.413)	(5.256)
Commitment savings	7.74	6.48	7.91	7.51	10.17	9.96	7.59	6.22	7.80	7.46	10.07	9.88
	(6.516)	(4.970)	(5.104)	(4.897)	(5.492)	(5.390)	(6.539)	(5.023)	(5.121)	(4.904)	(5.499)	(5.396)
Average amount saved Phase 1		0.58	0.59	0.54	0.62	0.62		0.58	0.58	0.54	0.62	0.62
		(0.090)	(0.087)	(0.083)	(0.088)	(0.088)		(0.092)	(0.088)	(0.084)	(0.088)	(0.088)
Daily study payment (Rs)				0.33		0.50				0.33		0.51
				(0.048)		(0.126)				(0.048)		(0.124)
Observations	3,435	3,435	3,435	3,435	2,932	2,932	3,435	3,435	3,435	3,435	2,932	2,932
R-squared	0.007	0.104	0.116	0.130	0.125	0.133	0.006	0.103	0.116	0.130	0.125	0.133
Baseline survey controls	NO	NO	YES	YES	YES	YES	NO	NO	YES	YES	YES	YES
Phase 1 controls	NO	YES	YES	YES	YES	YES	NO	YES	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	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 daily (net) 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. Phase 1 and baseline survey controls are the same as in the above tables.

Table 4: The Effect of Sobriety Incentives on Labor Market Outcomes

Dependent variable:	**Daily earnings (Rs./day)**				**Did any work**				**Hours worked**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Incentives	19.77	16.27	15.20		-0.04	-0.04	-0.04		0.23	0.15	0.17	
	(23.370)	(15.917)	(16.208)		(0.029)	(0.028)	(0.030)		(0.395)	(0.343)	(0.353)	
Choice	-3.37	14.36	7.09		-0.05	-0.04	-0.02		-0.32	-0.11	0.08	
	(25.341)	(18.064)	(19.789)		(0.032)	(0.030)	(0.029)		(0.400)	(0.335)	(0.328)	
Pooled alcohol treat				10.82				-0.03				0.12
				(15.655)				(0.025)				(0.297)
Observations	3,085	3,085	3,085	3,085	3,085	3,085	3,085	3,085	3,083	3,083	3,083	3,083
R-squared	0.002	0.293	0.321	0.321	0.004	0.046	0.079	0.079	0.003	0.133	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	287.7	287.7	287.7	287.7	0.894	0.894	0.894	0.894	6.829	6.829	6.829	6.829

Notes: This table shows the impact of the two sobriety incentive treatments on labor market outcomes.

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 variables are (i) reported earnings (Rs. per day; columns 1 through 4) (ii) whether an individual worked on a particular day (columns 5 through 8), and (iii) the number of hours worked on this day (columns 9 through 12). If an individual did not work on any given day, this is counted as zero hours worked.

3. The data used in the regressions is from retrospective surveys on the consecutive study days, during which individuals are asked about earnings and hours worked on the previous day. In addition, if individuals missed a day or two (and on Mondays), they were asked about the same outcomes two or three days ago, respectively.

4. Standard errors are in parentheses, clustered by individual. Phase 1 and baseline survey controls are the same as in the above tables.

Table 5: Interaction between Sobriety Incentives and Savings Treatments

	Dependent variable: amount saved at study office (Rs./day)					
	(1)	(2)	(3)	(4)	(5)	(6)
Pooled alcohol treatment	20.26	25.72	20.67	22.61	30.34	24.21
	(8.278)	(7.820)	(7.940)	(9.239)	(9.128)	(9.634)
High matching contribution				11.15	12.16	12.66
				(8.600)	(8.409)	(8.997)
Commitment savings	19.77	22.43	21.87	19.02	21.60	21.00
	(9.037)	(8.590)	(8.984)	(9.027)	(8.533)	(8.878)
Pooled treatment X Commitment	-18.83	-24.02	-22.29	-18.02	-23.33	-21.76
	(12.647)	(11.835)	(12.640)	(12.625)	(11.756)	(12.530)
Pooled treatment X High matching contribution				-3.41	-8.14	-5.60
				(12.400)	(11.521)	(11.850)
Observations	3,435	3,435	3,435	3,435	3,435	3,435
R-squared	0.006	0.054	0.076	0.008	0.055	0.078
Baseline survey controls	NO	NO	YES	NO	YES	YES
Phase 1 controls	NO	YES	YES	NO	NO	YES
Control mean	20.42	20.42	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) show the relationship between the effects of offering sobriety incentives and commitment savings. Columns (3) and (4) show the relationship between the effects of offering sobriety incentives and a high matching contribution.

3. Standard errors are in parentheses, clustered by individual. Phase 1 and baseline survey controls are the same as in the above tables.

Table 6: Demand for Incentives over Time

Dependent variable:	**Chose incentives vs. Rs. 90**			**Chose incentives vs. Rs. 120**			**Chose incentives vs. Rs. 150**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Week 2	0.03	0.06	0.02	0.01	0.03	0.01	0.01	0.02	-0.01
	(0.078)	(0.072)	(0.066)	(0.077)	(0.076)	(0.073)	(0.072)	(0.074)	(0.070)
Week 3	0.01	-0.01	-0.03	-0.02	-0.04	-0.06	0.10	0.09	0.08
	(0.083)	(0.080)	(0.075)	(0.087)	(0.083)	(0.079)	(0.089)	(0.088)	(0.085)
BAC during choice	-1.41			-1.15			-0.74		
	(0.361)			(0.345)			(0.313)		
Days sober in Phase 1		0.06			0.02			-0.05	
		(0.042)			(0.047)			(0.050)	
Days sober in Phase 2		0.09			0.05			0.07	
		(0.043)			(0.046)			(0.046)	
Incentives increased sobriety			0.05			0.07			0.15
			(0.064)			(0.079)			(0.075)
Exp frac sober under incentives			0.56			0.37			0.21
			(0.087)			(0.091)			(0.086)
Choice order ascending (Rs 90 first)	0.10	0.09	0.08	0.02	0.02	0.01	0.01	0.00	-0.00
	(0.066)	(0.061)	(0.058)	(0.063)	(0.063)	(0.063)	(0.061)	(0.062)	(0.061)
Observations	211	211	211	211	211	211	211	211	211
R-squared	0.701	0.716	0.746	0.589	0.579	0.608	0.449	0.443	0.470
Surveyor fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Choice group mean in Week 1	0.600	0.600	0.600	0.467	0.467	0.467	0.307	0.307	0.307

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 (choice 1) in columns (1) through (3), Rs. 120 (choice 2) in columns (4) through (6), and Rs. 150 (choice 3) 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.

Table 7: Demand for Incentives Across Treatment Groups

Dependent variable:	**Chose incentives vs. Rs. 90**			**Chose incentives vs. Rs. 120**			**Chose incentives vs. Rs. 150**		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Incentives	0.12	0.12	0.11	0.14	0.13	0.13	0.14	0.14	0.14
	(0.075)	(0.068)	(0.068)	(0.081)	(0.073)	(0.074)	(0.080)	(0.076)	(0.078)
Choice	0.10	0.06	0.07	0.11	0.07	0.08	0.14	0.11	0.12
	(0.076)	(0.071)	(0.071)	(0.081)	(0.077)	(0.078)	(0.080)	(0.078)	(0.078)
BAC during choice	-1.69		-0.80	-1.11		-0.27	-1.12		-0.49
	(0.337)		(0.367)	(0.343)		(0.352)	(0.331)		(0.376)
Exp sober days under incentives		0.10	0.09		0.09	0.08		0.07	0.06
		(0.011)	(0.013)		(0.011)	(0.013)		(0.012)	(0.014)
Choice order ascending (Rs 90 first)	0.04	0.07	0.06	-0.03	-0.01	-0.01	-0.05	-0.03	-0.03
	(0.065)	(0.057)	(0.059)	(0.068)	(0.062)	(0.063)	(0.069)	(0.066)	(0.066)
Observations	215	216	215	215	216	215	215	216	215
R-squared	0.694	0.742	0.748	0.554	0.617	0.616	0.496	0.534	0.536
Surveyor fixed effects	YES	YES	YES	YES	YES	YES	YES	YES	YES
Control mean	0.494	0.494	0.494	0.373	0.373	0.373	0.313	0.313	0.313

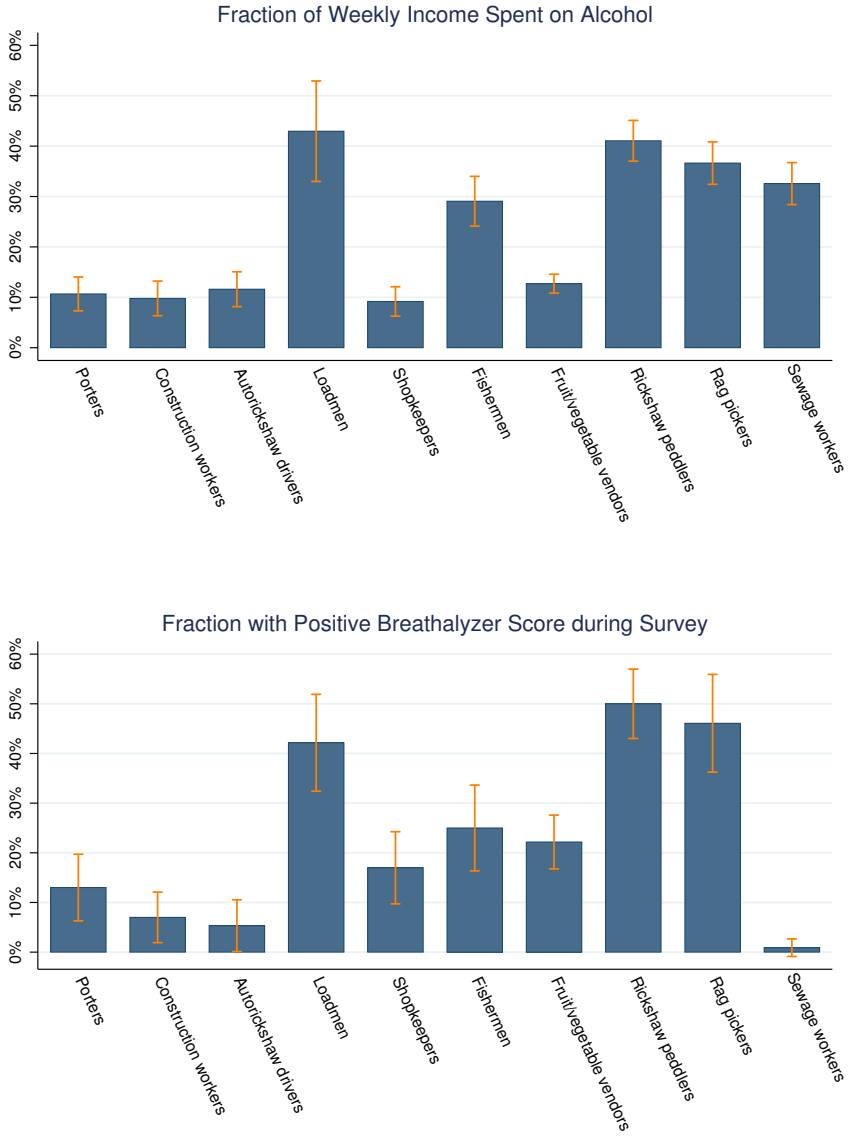
Notes: This table considers how the two sobriety incentives treatments affected the demand for incentives.

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 "Expected sober days under incentives" refers to subjects' answer to this question.

C For Online Publication: Supplementary Appendix

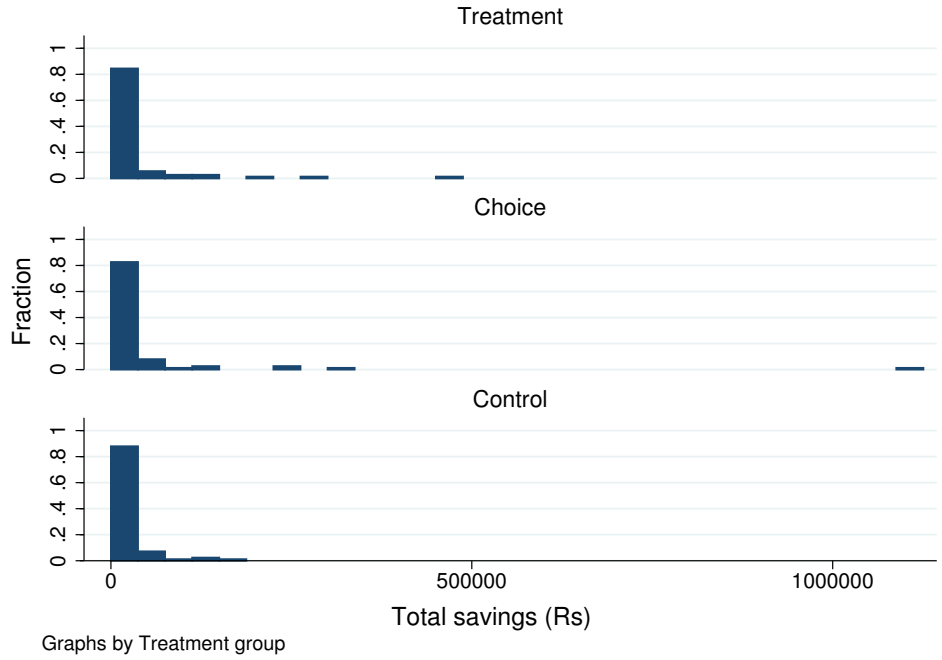
Figure C.1: Prevalence of Alcohol Consumption Among Males in Chennai, India (cont'd)



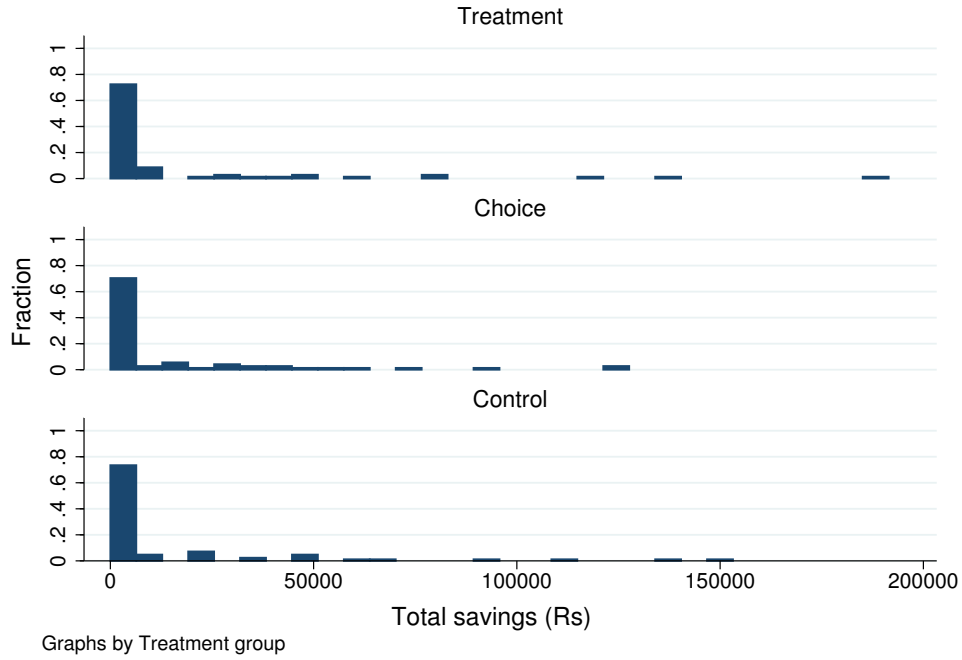
Notes: The upper panel of this figure shows the fraction of weekly income spent on alcohol for the sample described in Figure 1. For each individual, the fraction spent on alcohol is calculated by dividing reported weekly alcohol expenditures by reported weekly earnings. Weekly alcohol expenditures are 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. The lower panel of this figure shows the fraction of individuals who were inebriated at the time of the survey, as measured by having a positive blood alcohol content in a breathalyzer test. All surveys were conducted during the day, i.e. between 8 am and 6 pm. Error bars measure 95 percent confidence intervals.

Figure C.2: Reported Total Savings by Incentive Treatment Group at Baseline

(a) All individuals



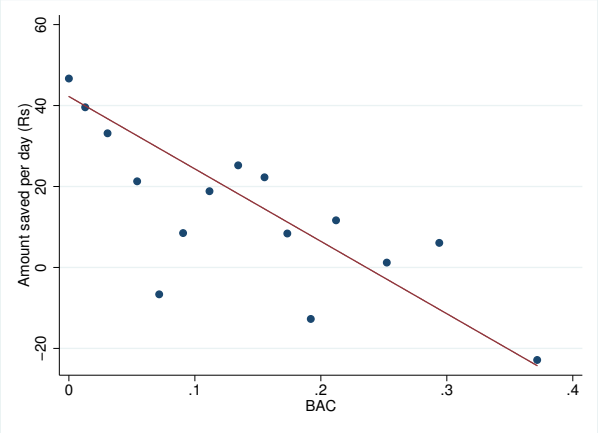
(b) Only individuals with savings below Rs. 200,000



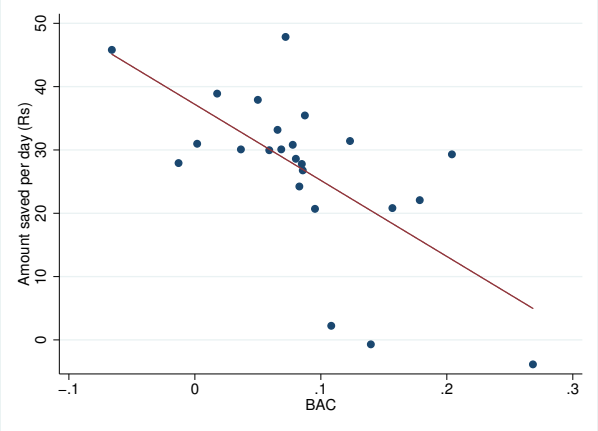
Notes: The figure shows the distribution of total savings by study participants in each of the sobriety incentive treatment groups. The upper panel of the figure shows the unconditional distribution. The lower panel of the figure shows the distribution for individuals with total savings below Rs. 200,000 (i.e. excluding six individuals).

Figure C.3: Cross-sectional Relationship between Daily Amounts Saved and BAC

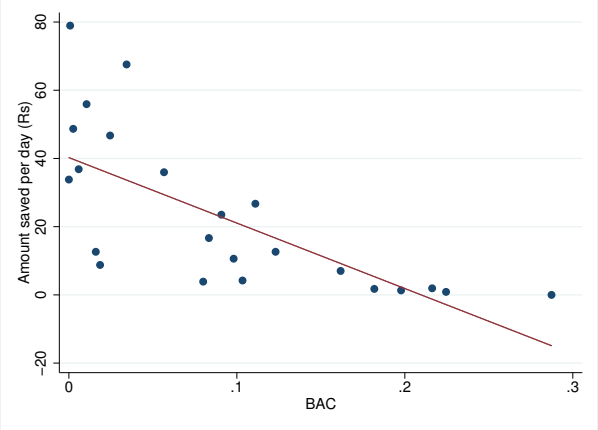
(a) Daily amount saved and BAC (no individual FE)



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

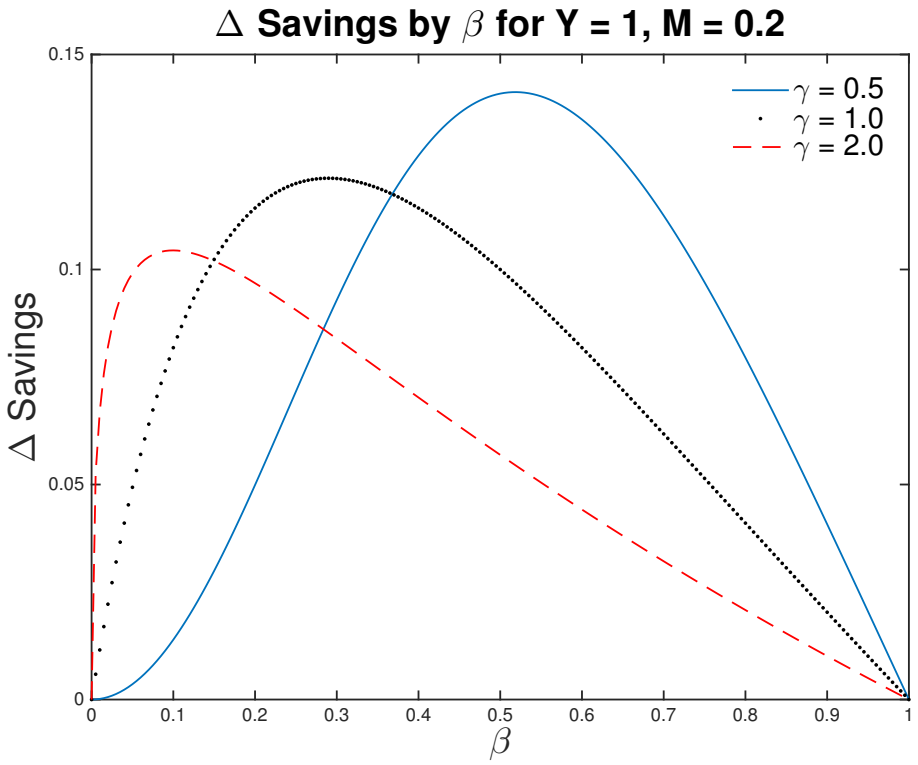


(c) Mean amount saved and mean BAC



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. The top panel depicts a binned scatter plot (including regression line) for all observations in the Control Group. 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 C.4: 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 C.1.

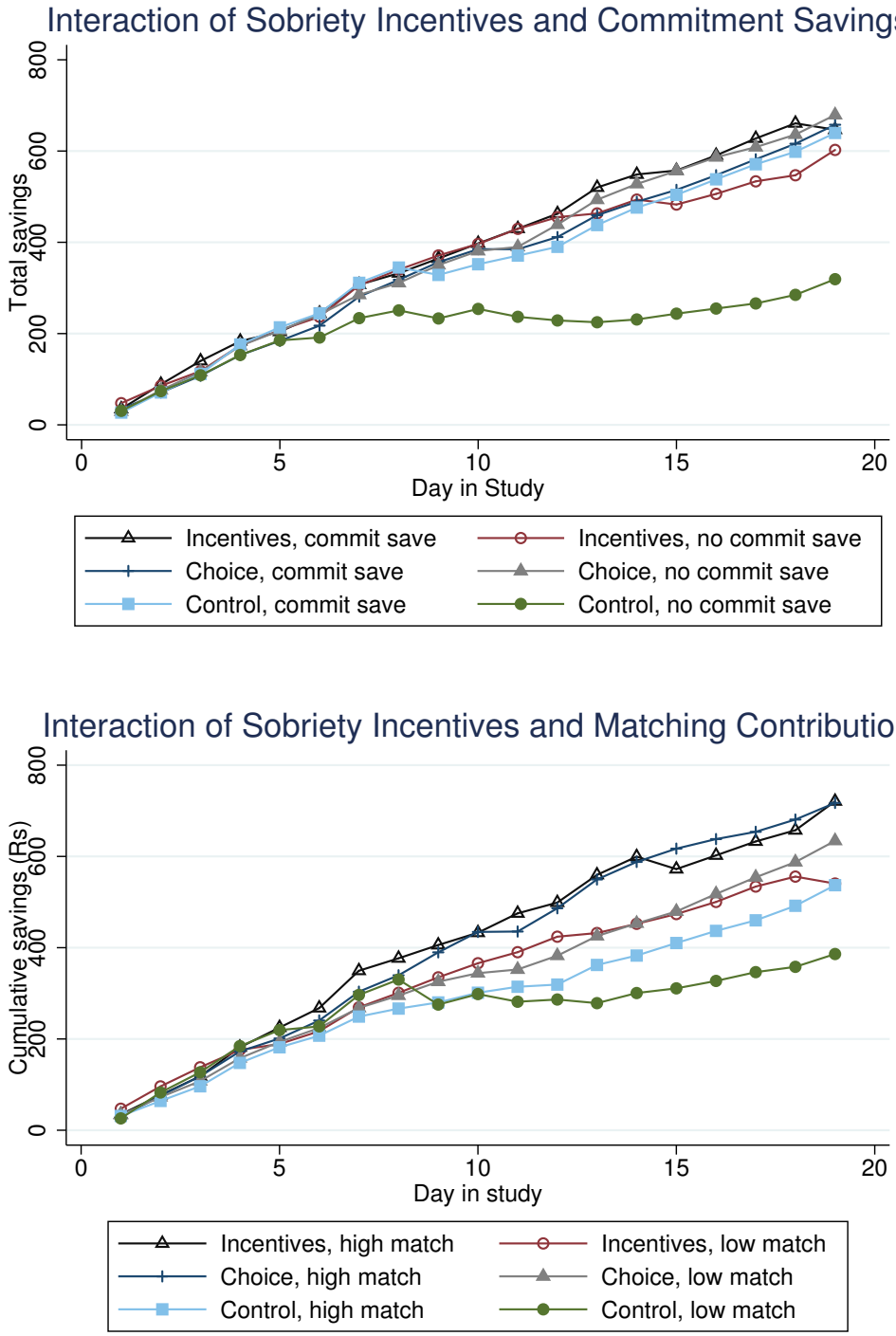
1. The figure shows the present bias (as measured by $\beta \in [0, 1]$) on the horizontal axis and the increase in savings due to offering a commitment savings option on the vertical axis for the iso-elastic utility case.

2. This increase in savings is given by the difference in consumption in period 3 between the two cases described in my model, i.e. $\Delta = c_3^{\mathrm{C}} - c_3^{\mathrm{NC}}$ as shown in equation (14).

3. 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).

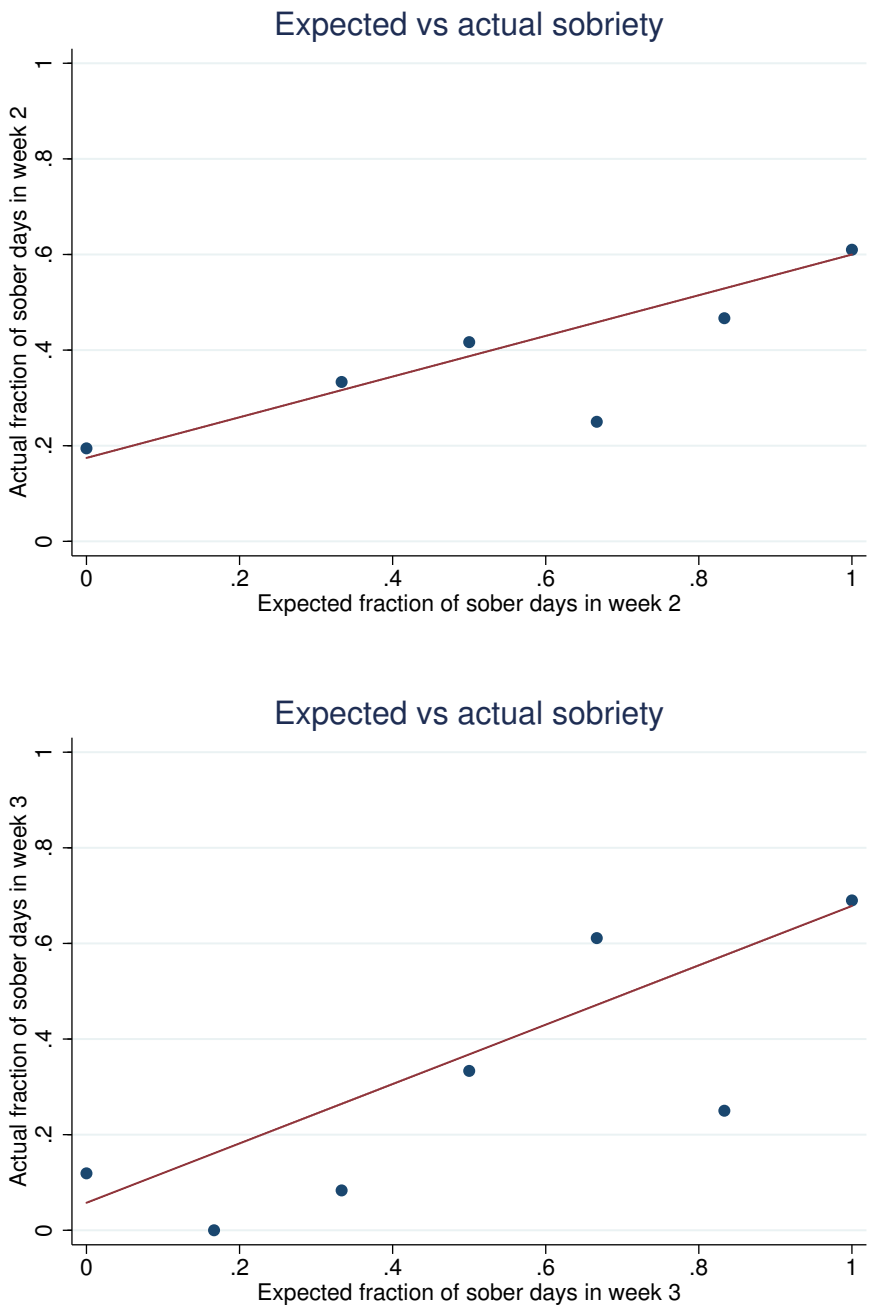
4. In the specific figure shown here, $Y = 1$ and $M = 0.2$. The relationship is very similar, if not identical, for different parameter values. An explicit solution for Δ in the log case ($\gamma = 1$) is given in the Supplementary Appendix below.

Figure C.5: Interaction between Sobriety Incentives (not pooled) and Savings Treatments



Notes: This figure shows the interaction between the cross-randomized sobriety incentives and savings treatments. The figure is the same as Figure 6, except for the fact that the two sobriety incentive treatment groups are shown separately rather than pooled (as in Figure 6).

Figure C.6: Belief Regarding their Future Sobriety (under Incentivizes)



Notes: This figure shows average beliefs regarding their future sobriety in the Incentive Group. As part of the comprehension questions during each of the choice sessions, individuals in the Incentive and Choice Groups were asked on how many of the subsequent days they expected to visit the study office sober. Both graphs show the relationship between individuals' answers to these questions and the actually realized (mean) number of sober visits to the study office for each of the predicted number of subsequent sober visits.

1. The upper panels shows predicted and actual sobriety for week 2, elicited during the first choice session (on day 7 of the study).

2. The lower panels shows predicted and actual sobriety for week 3, elicited during the second choice session (on day 13 of the study).

Table C.1: 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 of 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 C.2: Balance Table for Main Demographics

	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 sample means 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 Groups compared to the Control Group, respectively. Column 6 shows the corresponding p-values for comparisons between the Control Group and the Incentive and Choice Groups combined.

Table C.3: 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 sample means 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 Groups compared to the Control Group, respectively. Column 6 shows the corresponding p-values for comparisons between the Control Group and the Incentive and Choice Groups combined.

Table C.4: 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 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 sample means 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 Groups compared to the Control Group, respectively. Column 6 shows the corresponding p-values for comparisons between the Control Group and the Incentive and Choice Groups combined.

Table C.5: The Effect of Incentives on Sobriety Before and During Study Office Visits

	Sober at study office				**Blood-alcohol content**				**# drinks before visit**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Incentives	0.11	0.12	0.12		-0.04	-0.03	-0.03		-1.09	-1.11	-1.08	
	(0.058)	(0.045)	(0.045)		(0.013)	(0.008)	(0.008)		(0.372)	(0.276)	(0.256)	
Choice	0.10	0.14	0.13		-0.01	-0.02	-0.02		-0.76	-0.92	-0.88	
	(0.058)	(0.039)	(0.041)		(0.015)	(0.008)	(0.008)		(0.376)	(0.238)	(0.246)	
Pooled alcohol treatment				0.13				-0.02				-0.97
				(0.038)				(0.007)				(0.214)
Observations	3,435	3,435	3,435	3,435	2,932	2,932	2,932	2,932	2,929	2,929	2,929	2,929
R-squared	0.010	0.266	0.292	0.291	0.019	0.424	0.441	0.440	0.022	0.295	0.315	0.315
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	2.960	2.960	2.960	2.960

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 5 through 8 is individuals' measured blood alcohol content from a breathalyzer test. The outcome variable in columns 9 through 12 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. Phase 1 and baseline survey controls are the same as in the above tables.

Table C.6: The Effect of Incentives on Overall Alcohol Consumption

	# drinks overall				**No drink at all**				**Alcohol expenses (Rs.)**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Incentives	-0.33	-0.21	-0.33		0.01	0.00	0.02		-9.91	-8.15	-9.33	
	(0.289)	(0.258)	(0.256)		(0.028)	(0.028)	(0.029)		(4.897)	(4.667)	(4.736)	
Choice	-0.35	-0.25	-0.30		0.02	0.02	0.02		-10.00	-8.50	-10.14	
	(0.344)	(0.264)	(0.271)		(0.029)	(0.028)	(0.028)		(5.000)	(4.322)	(4.309)	
Pooled alcohol treatment				-0.32				0.02				-9.77
				(0.225)				(0.024)				(3.987)
Observations	2,932	2,932	2,932	2,932	2,930	2,930	2,930	2,930	2,932	2,932	2,932	2,932
R-squared	0.003	0.141	0.175	0.175	0.001	0.029	0.065	0.065	0.011	0.125	0.178	0.178
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	90.89	90.89	90.89	90.89

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. Phase 1 and baseline survey controls are the same as in the above tables.

Table C.7: The Marginal Propensity to Save out of Lottery Earnings

	Dep. var.: amount saved at study office (Rs./day))					
	(1)	(2)	(3)	(4)	(5)	(6)
Pooled alcohol treatment	12.32	15.56	11.20	11.71	14.93	10.94
	(6.256)	(6.127)	(6.064)	(6.110)	(6.049)	(6.063)
Amount won in lottery on previous study day	0.29	0.33	0.25			
	(0.166)	(0.162)	(0.144)			
Pooled alcohol treatment X Lottery amount				0.36	0.40	0.28
				(0.192)	(0.188)	(0.158)
Control Group X Lottery amount				0.15	0.19	0.19
				(0.295)	(0.286)	(0.277)
Observations	3,435	3,435	3,435	3,435	3,435	3,435
R-squared	0.008	0.043	0.067	0.008	0.044	0.067
Baseline survey controls	NO	NO	YES	NO	NO	YES
Phase 1 controls	NO	YES	YES	NO	YES	YES
Control mean	20.42	20.42	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. Phase 1 and baseline survey controls are the same as in the above tables.

Table C.8: Effect of Sobriety Incentives on Family Resources

	Rs./day given to wife				**Rs./day to other fam. members**				**Rs./day to family overall**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Incentives	20.09	20.09	20.09		-4.51	-4.51	-4.51		15.58	15.58	15.58	
	(19.139)	(19.139)	(19.139)		(9.424)	(9.424)	(9.424)		(19.299)	(19.299)	(19.299)	
Choice	15.33	15.33	15.33		-10.02	-10.02	-10.02		5.31	5.31	5.31	
	(20.193)	(20.193)	(20.193)		(8.495)	(8.495)	(8.495)		(19.982)	(19.982)	(19.982)	
Pooled alcohol treatment				17.53				-7.48				10.05
				(15.928)				(7.622)				(15.543)
Observations	2,969	2,969	2,969	2,969	2,969	2,969	2,969	2,969	2,969	2,969	2,969	2,969
R-squared	0.002	0.002	0.002	0.002	0.001	0.001	0.001	0.001	0.001	0.001	0.001	0.000
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	150.1	150.1	150.1	150.1	25.36	25.36	25.36	25.36	175.5	175.5	175.5	175.5

Notes: This table shows the impact of the two sobriety incentive treatments on family resources.

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 variables are (i) money given to the wife (Rs./day; always zero for unmarried individuals) (ii) other family expenses (the sum of money given to other family members and direct household expenses), and (iii) total family resources (i.e. the sum of (i) and (ii)).

3. The data used in the regressions is from retrospective surveys on the consecutive study days, during which individuals are asked about each of the above variables on the previous day. In addition, if individuals missed a day or two (and on Mondays), they were asked about the same outcomes two or three days ago, respectively.

4. Standard errors are in parentheses, clustered by individual. ***, **, and * indicate significance at the 1, 5, and 10 percent level, respectively. Phase 1 and baseline survey controls are the same as in the above tables.

Table C.9: Expenses on Food, Coffee & Tea, and Tobacco & Paan

	Rs./day spent on food				**Rs./day spent on coffee/tea**				**Rs./day spent on tobacco/paan**			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Incentives	3.89	3.89	3.89		0.02	0.02	0.02		2.13	2.13	2.13	
	(6.845)	(6.845)	(6.845)		(1.013)	(1.013)	(1.013)		(1.818)	(1.818)	(1.818)	
Choice	-3.45	-3.45	-3.45		-0.14	-0.14	-0.14		-2.95	-2.95	-2.95	
	(5.907)	(5.907)	(5.907)		(1.011)	(1.011)	(1.011)		(1.557)	(1.557)	(1.557)	
Pooled alcohol treatment				0.04				-0.06				-0.53
				(5.239)				(0.859)				(1.462)
Observations	1,035	1,035	1,035	1,035	1,047	1,047	1,047	1,047	1,047	1,047	1,047	1,047
R-squared	0.003	0.003	0.003	0.000	0.000	0.000	0.000	0.000	0.026	0.026	0.026	0.000
Baseline survey controls	NO	NO	YES	YES	NO	NO	YES	YES	NO	YES	YES	YES
Phase 1 controls	NO	YES	YES	YES	NO	YES	YES	YES	NO	YES	YES	YES
Control group mean	50.93	50.93	50.93	50.93	4.522	4.522	4.522	4.522	10.52	10.52	10.52	10.52

Notes: This table shows the impact of the two sobriety incentive treatments on other expenditures.

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. Individuals were only asked about the below variables every third day (the timing was unannounced).

2. The outcome variables are (i) expenditures on food outside the household (columns 1 through 4) (ii) expenditures on coffee and tea (columns 5 through 8), and (iii) expenditures on tobacco and paan (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. Phase 1 and baseline survey controls are the same as in the above tables.

Table C.10: Attrition and Inconsistencies of Choices

	Choice Group			**Incentive Group**	**Control Group**
	Week 1	Week 2	Week 3	Week 3	Week 3
Present & consistent (%)	88.0	89.3	88.0	90.1	86.7
Absent (%)	5.3	6.7	6.7	5.6	6.0
Inconsistent (%)	6.7	4.0	5.3	4.2	7.2

Notes: This table shows the fraction of individuals who were present and made consistent choices by treatment group and week of study. During a given choice session, an individual chose inconsistently if he chose Option B for the unconditional amount Y_1, but Option A for the unconditional amount Y_2 with $Y_2 > Y_1$. For instance, his choices are inconsistent if he preferred Option B in Choice 1, but not in Choice 3.

Table C.11: Summary of Choices in Choice Group Over Time

	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	60.0	62.7	57.3
(2)	Rs. 60	Rs. 120	Rs. 120	46.7	52.0	44.0
(3)	Rs. 60	Rs. 120	Rs. 150	30.7	33.3	40.0

Notes: This table shows the fraction of individuals among the Choice Group who preferred incentives over unconditional amounts for each of the choices by week of study. Individuals who were either absent or did not choose consistently are counted as *not* preferring incentives.

C.1 Solution for the Case of Iso-elastic Utility

This section provides the solution of the model described in section 5.1 for the commonly used case of iso-elastic utility.

No commitment savings. Equations (7) and (9) 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:

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

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 (10) and (11) 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 (12), this implies

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

C.2 A Special Case: Log Utility

This section considers a special case of log utility ($\gamma = 1$), i.e. $u(c_t) = \log(c_t)$.

No commitment savings. Equations (7) and (9) become

$$c_3 = \beta(1+M)c_2 \tag{23}$$

$$c_2 = \left[\beta\frac{dc_2}{dY_2} + \left(1 - \frac{dc_2}{dY_2}\right)\right] c_1 \tag{24}$$

Using $c_3 = (Y_2 - c_2)(1+M)$, we use (23) to solve for c_3 and c_2 as functions of Y_2:

$$c_2 = \frac{1}{1+\beta}Y_2 \quad \text{and} \quad c_3 = \frac{\beta(1+M)}{1+\beta}Y_2 \tag{25}$$

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

$$c_1 = Y - c_2 - \frac{c_3}{1+M} = Y - \frac{2\beta}{1+\beta}c_1 - \frac{2\beta^2}{1+\beta}c_1 = \frac{Y}{1+\frac{2\beta}{1+\beta}+\frac{2\beta^2}{1+\beta}} \tag{26}$$

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

Commitment savings. Consider now the solution for the commitment savings case. Equations (10) and (11) become

$$c_2 = \beta c_1 \qquad c_3 = (1+M)c_2 \tag{27}$$

Using the budget constraint (12), this yields

$$c_3^C = (Y - c_1 - c_2)(1+M) \tag{28}$$

$$= Y(1+M) - \frac{c_3}{\beta} - c_3 \tag{29}$$

$$= \frac{\beta}{1+2\beta}Y(1+M) \tag{30}$$

Comparing the two solutions yields

$$\Delta \equiv c_3^{\text{C}} - c_3^{\text{NC}} = \left[\frac{\beta(1-\beta)}{(1+2\beta)(1+\beta)}\right] Y(1+M) \tag{31}$$

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

$$\frac{\partial[\cdot]}{\partial\beta} = \frac{1-2\beta-5\beta^2}{(1+3\beta+2\beta^2)^2} \tag{32}$$

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