# What Motivates Health Behavior: Preferences, Beliefs, or Constraints? Evidence from Psychological Interventions in Kenya*

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**Abstract**

We test the effect of light-touch psychological interventions on health-related behaviors and psychological outcomes using a randomized controlled trial among 3750 young women in rural Kenya. A two-session executive function intervention ("EF") aimed to relax cognitive constraints; a two-session time preference intervention ("TP") aimed to reduce present bias and impatience; and an information treatment ("INF") aimed to correct incorrect beliefs about the benefits of health behaviors. Three months after the interventions, the EF and TP interventions lead

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to significant 18 percent and 27 percent increases, respectively, relative to a pure control ("PC") group in the share of households who have chlorinated their drinking water. This increase was accompanied by significant 27 percent (EF) and 32 percent (TP) reductions in the number of diarrhea episodes in children relative to the information treatment. The TP intervention also significantly increased the share of individuals who save regularly by 38 percent. The information treatment, which delivered the same information about the benefits of chlorination as the active interventions, did not significantly affect these outomes, and in some cases, affected them significantly less. The EF intervention improved performance on a planning lab task (Tower of London) relative to the information group. The TP intervention did not affect time preferences. Both interventions increased self-efficacy, i.e. beliefs about one's own ability to achieve desirable outcomes. Together, these results suggest that psychological interventions can affect health behaviors, possibly through mechanisms including self-efficacy.

JEL codes:
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# 1. Introduction

Individuals often do not engage in welfare-enhancing behaviors even when they have low cost and large benefits. A prominent example is chlorination of drinking water, which is highly effective in preventing water-borne illness, but infrequently used by individuals without access to clean water (Kremer et al. 2009). Why do individuals not chlorinate? One possibility is that they are not aware of the benefits of chlorination; i.e., they might have incorrect *beliefs*. A second possibility is that small costs in the present, such as buying and using chlorine, outweigh distant benefits, such as fewer diarrhea episodes among children. This possibility represents an account in terms of (time) *preferences*. A third possibility is that they lack the ability to select, plan, or execute the actions required to implement their preferences. In psychology, this is a deficit in executive function; in economics, we think of it as a *constraint* on cognitive capacity.[1]

Here we test the relative importance of these channels in generating poor takeup of health behaviors in a randomized controlled trial in rural Kenya with 3750 young women and four treatment arms. A pure control group (PC) received no intervention. An "information" (INF) group received an information intervention that attempted to address incorrect beliefs about the benefits of chlorination. A further treatment group received the information treatment, as well as a two-session intervention that aimed to improve the planning component of executive function (EF). A final treatment group received the information treatment, as well as a two-session intervention that

[1]Executive functions are those cognitive processes required for forming goals, planning ahead, and carrying out plans directed by goals (Lezak 1983; Miller and Cohen 2001). There is a debate about how to categorize subcomponents, and whether one unifying mechanism underlies all functions (Kimberg, D'Esposito, and Farah 1997; de Frias, Dixon, and Strauss 2006; Godefroy et al. 1999; Jurado and Rosselli 2007). In most categorizations, executive function contains three processes: inhibition, which includes selective attention and self-regulation; memory; and higher-order cognitive functions, including cognitive flexibility, intelligence, and planning (Miyake et al. 2000; Diamond 2013; Lyon and Krasnegor 1996; Suchy 2009). We target one higher-order cognitive function, planning, i.e. the ability to generate a strategy, including the sequencing of steps, to achieve intended goals (Carlin et al. 2000). We do not focus on attention, inhibitory control, or memory, although these functions may also be affected by our intervention.

aimed to manipulate time preferences (TP), i.e. increase patience and reduce present bias. The motivation to combine the information treatment with the psychological interventions in the last two arms was to hold constant the more traditional "beliefs" channel across the three treatment arms, and thereby be able to ask whether interventions targeting the less studied channels of preferences and psychological constraints can generate an impact that goes beyond correcting incorrect beliefs.

The information treatment was successful in affecting beliefs about the effectiveness of chlorination: the EF, TP, and INF groups showed significant increases in their belief that chlorination can prevent diarrhea relative to the pure control group. The magnitudes of these effects were similar and not statistically different.

The EF treatment was successful in improving planning ability over and above the effect of the information treatment: we find significant improvements on a lab measure of ability to plan or sequence activities, the "Tower of London" task, in which participants have to make and implement a plan to move a set of shapes on a screen into a new configuration. It also affected whether this higher order, abstract planning ability manifested itself in everyday behavior and choices. On a self-reported measure of whether participants were choosing to make plans to do necessary tasks, and whether they followed through on them, the Behavioral Activation for Depression scale, participants in the EF group scored significantly higher than those in the INF and control groups, and somewhat but not significantly higher than those in the TP group. Conversely, the TP treatment did not significantly affect lab measures of time preference. Intriguingly, we find important effects of both psychological interventions, TP and EF, on an 'internal' dimension of beliefs: In addition to 'external' beliefs about the efficacy of chlorination, behavior is likely influenced by participants' belief in their own ability to shape their life and achieve desirable outcomes. In psychology, this is known as *self*-efficacy; in economics, it can be thought of as perceived returns to effort (De Quidt and Haushofer 2016).[2] We find significant increases in self-efficacy in both the TP and EF

[2]To illustrate the parallel between self-efficacy and believed returns to effort in eco-

treatments relative to INF. Thus, the EF intervention affected its intended target as well as self-efficacy, while the TP intervention affected self-efficacy but not its intended target.

We then test whether the three interventions affect water chlorination and related health outcomes, as well as economic outcomes. In the EF and TP groups relative to the PC group, we find significant increases of 27 and 18 percent, respectively, in the share of households whose drinking water contains chlorine. The effect in the INF group was smaller and not significant, although not significantly different from EF and TP. Concomitantly, the EF and TP treatments significantly reduce the number of diarrhea episodes in children relative to PC, by 27 and 32 percent, respectively; again the effect in the INF group is small and not statistically significant, and the effect on diarrhea in the EF and TP groups is significantly larger than that in the INF group.

The effect of our interventions is not limited to the health domain, but also resulted in significant changes in economic behaviour: While the TP intervention did not affect our laboratory measure of time preferences, it caused a robust and significant 38 percent increase in the share of individuals who save regularly. Further significant effects are observed on hours worked in one's business, business expenditure, and family planning in the TP relative to the INF group (although not the pure control group).

Together, these results suggest that psychological interventions targeting executive function and time preferences can affect health-related behaviors and outcomes. These effects cannot be achieved by simply correcting incorrect beliefs about the effectiveness of engaging in health behaviors. The TP and EF interventions were equally effective in influencing health-related outcomes, although only the EF intervention affected its intended psychological target. Intriguingly, both interventions affected self-efficacy, i.e. beliefs about one's ability to achieve desirable outcomes. This finding creates the surprising possibility that these interventions, even though they targeted preferences

nomics, consider the case where a mother believes that, no matter how much effort she invests into keeping her children healthy (and no matter how effective chlorination is at purifying water), whether her children will get sick or not is ultimately up to God's will.

and psychological constraints rather than beliefs, did take their effects on outcomes through a beliefs mechanism; however, the beliefs they affected were not 'external' beliefs about the world, but internal beliefs about the individual's ability.We thus conclude that psychological interventions targeting preferences and psychological constraints can complement traditional interventions targeting incorrect beliefs about facts, but they may take their effects by affecting beliefs about ability.

A possible confound of our interventions are demand effects: the TP and EF session modules partially relied on examples and case stories. While mostly prompting participants to contribute examples from their own life, the scripts also mentioned chlorination. It is possible that the mention of chlorination itself represents a nudge to chlorinate, by focusing participants' attention on this issue. We test for this possibility by measuring the salience of three future-oriented behaviours (chlorination, savings, and farm investment) compared to non-future oriented behaviours. We find indeed that TP, EF, and INF all increased the salience of chlorination (but not saving or farm investment), with a stronger effect for TP and EF. While this constitutes a possible alternative explanation for our treatment effects on chlorination, it is unlikely that salience fully explains our results: our effects on savings, as well as on various other non-chlorine measures, cannot be explained by the salience of chlorination.

Our findings contribute to a recent literature in economics and psychology studying the effects of psychological interventions on economic outcomes. Using more involved interventions that resemble psychotherapy, Blattman, Jamison, and Sheridan (2017), Heller et al. (2017), Ghosal et al. (2013), and Baranov et al. (2017) show that such treatments can improve psycho-social and economic outcomes. A salient feature of these studies is that the psychological mechanisms through which the interventions affect behavior are not always clear; for instance, psychotherapy may change beliefs about one's ability to achieve desirable outcomes; preferences; and psychological constraints such as planning ability or motivation.

Our study differs in two regards from this literature: first, we put emphasis on measuring carefully the effect of our interventions on preferences, beliefs,

and constraints. Second, and more importantly, we developed interventions specifically geared towards manipulating preferences, beliefs, and constraints independently. This fact, in conjunction with the measurement of the psychological targets of the interventions, allows us to draw conclusions about which mechanisms are plausible. In particular, as mentioned above, our results do suggest that beliefs may play a role: the significant increase in self-efficacy, i.e. the belief in one's ability to achieve desirable outcomes (analogous to perceived returns to effort), suggests that subjective "inward-looking" beliefs may impede the take-up of chlorination. In addition, because the INF intervention affects beliefs about the effectiveness of chlorination to a similar degree as the other interventions, but is not successful in significantly increasing chlorination, and is significantly less successful than the other interventions in preventing diarrhea, we conclude that incorrect beliefs about the effectiveness about chlorination are also unlikely to be an obstacle to takeup of chlorination.

Our study is most closely related to Bernard et al. (2014), who show that aspirational videos increase aspirations, savings, educational investment and investment in productive technologies in Ethiopia. This study resembles ours in that the intervention is short-term in nature (one session compared to our two-session intervention). It similarly distinguishes the psychological mechanism through which the intervention affects behavior, using a placebo video to account for effects of any treatment, showing the intervention affects beliefs about one's own ability and potential future opportunities – aspirations and locus of control – and showing it does not affect other beliefs or preferences. Our paper differs in three ways. First, as discussed above, we test the relative effect of interventions targeting each of preferences, beliefs, and constraints against each other, rather than focusing on one intervention. In particular, we focus on cognitive constraints, in addition to beliefs and preferences. Second, we are able to distinguish the effect of information (in the INF arm) from the effect of a change in self-efficacy (beliefs about one's own ability). Third, as we discuss below, we are able to examine the role of material and effort costs in the decision to chlorinate water, compared to psychological or behavioral barriers. We cross-cut our intervention with one which provides dispensers at

water points to provide chlorine free and in a location which makes it very easy to treat water. Our interventions have stronger effects where dispensers are present, suggesting that cost (both in money and effort) remains a barrier to chlorination, but that behavioral barriers remain even when costs are reduced, which are targeted by our intervention.

The remainder of this paper is structured as follows. Section 2 describes the study design and outcome variables. Section 3 describes the estimation approach. Section 4 reports results. Section 5 concludes.

# 2. Design and Measures

## 2.1 Sampling Strategy

We study a sample of women aged 18–35 in rural Western Kenya. We recruited a pool of roughly 3750 individuals from Bungoma and Kakamega counties between October 2017 and January 2018, of whom 2330 participated in the interventions.

One behavior we examine is whether households chlorinate water. The villages included in the study are a subsample of the villages which took part in the WASH Benefits study in Bungoma and Kakamega counties, a study of a variety of interventions targeted in part at increasing water chlorination. We restricted sample recruitment to villages which were assigned to either the "Water Quality" treatment arm or the "Passive Comparison" arm of the WASH Benefits study (see exception below). In the "Water Quality" villages, chlorine dispensers were installed at community water points during the WASH Benefits study and sample households received a free 1l bottle of chlorine every six months. Local promoters visited households each month to encourage treating and safely storing water. Evidence Action's Dispensers for Safe Water program has since maintained these dispensers and retain a local promoter in each community. Households in WASH Benefits "Passive Comparison" villages did not receive any intervention or household visit.

By splitting our study sample across the "Water Quality" and "Passive Comparison" villages, we are able to identify heterogeneous effects of Evidence

Action's chlorine dispensers and promotion on the efficacy of our interventions. We exclude from our sample all women from households which took part in the WASH study by not sampling women who had children the correct age to be eligible for the WASH study.

However, a coding error during randomization resulted in the inclusion of participants from villages assigned to other WASH Benefits treatment arms (approximately 20% of sample, in Mumias constituency, Kakamega county). These villages received sanitation, handwashing, and nutrition interventions in addition to the "Water Quality" interventions. However, these interventions were at the household level, and as before our recruitment strategy excludes direct WASH Benefits participants, so participants in our study did not receive them. Thus we include these villages in our main estimation of treatment effects. For the heterogeneity analysis by WASH Benefits "Water Quality" intervention status, we group treatment arms by whether or not they received the water quality interventions (in addition to our focus arm "Water Quality", this was also the case for arms which received "Water Quality, Sanitation and Handwashing" and "Water Quality, Sanitation, Handwashing and Nutrition"). We conduct additional robustness checks, including (i) excluding them from the heterogeneity analysis by "Water Quality" assignment, and (ii) excluding them from all analyses described in section 3.

In three constituencies in these counties, enumerators visited all villages assigned to the "Water Quality" and "Passive Comparison" arms of the WASH Benefits study. In a fourth constituency, enumerators visited villages assigned to all arms of the WASH Benefits study.

With the help of local guides, enumerators visited all households in each village and conducted a census to determine household eligibility. Enumerators collected demographic information on women that met the screening criteria: i) aged 18-35 inclusive; ii) the household did not participate in the WASH Benefits study. As a second check on (ii), enumerators also excluded households with children aged either 3-4 or 4-5, depending upon the village's WASH Benefits block assignment, since such households were considered very likely to have participated in the WASH Benefits study.

From this census list, all eligible women in three of the constituencies were randomized into one of the intervention arms. In the fourth constituency, a random sample of eligible women was taken.

**Sample Size and Statistical Power** The pool of 3750 individuals recruited for the study were randomized into the study arms as follows:

1. 992 assigned to Treatment Arm 1: "Time Preferences"
2. 991 assigned to Treatment Arm 2: "Executive Function"
3. 992 assigned to the "Information" group ("Nature in Kenya")
4. Roughly 775 assigned to the "Pure Control" group.

**Randomization Strategy** We allocated participants to one of the four arms using stratified random assignment. We stratified on two variables collected during the census described in 2.1 :

1. Wealth Index: the total value of a limited set of assets which participants reported owning in the recruitment survey. The assets included in the index are bicycles, cellphones, gas stoves, all livestock, radios, sofas and televisions. Participants were split at the 50th percentile into a 'high' or 'low' wealth group.
2. Village of residence

Participants were also randomly assigned to attend baseline and intervention sessions either in the morning or in the afternoon. While participants were first invited to and encouraged to attend the session type assigned to them, they were allowed to switch to the other session time if necessary in order to minimize attrition.

Randomization was conducted using the "randtreat" command in Stata, with 'misfits' equally distributed across treatment arms to ensure the target group sizes were achieved. Balance checks were conducted to ensure that randomization was successful (see Table 6).

**Attrition** Attrition was a potential concern due to the need to convene participants in a central location to conduct behavioral laboratory and group intervention sessions, on three separate occasions over the course of three months. Steps taken to mitigate attrition included gathering contact details not only for participants themselves but also for their family members, neighbors and village elders. Field officers returned to villages to track down sample participants who could not be contacted by phone. Although the initial session time that participants were invited to was randomized (and is thus available as an instrument), we also offered participants flexibility in which day and time they attended sessions to better accommodate their schedules.

### 2.1.1 Treatment and Data Collection

The study included three active and one passive treatment arm: one arm aimed at improving planning and performance of basic tasks ("Executive Function", EF), one arm that encouraged respondents to visualize their future ("Time Preferences", TP), an information intervention ("Information", INF), and a passive "pure control" arm. The three active treatments each contain two interactive group sessions of two hours duration each, with one week in between the sessions. The structure of each group session was held constant across treatment arms: each included a short lecture, group discussion, reflection of how the themes relate to participants' own lives, and some drawing and list-writing. Participants were split into groups of five for the sessions, which were run by a locally-trained female facilitator.

The baseline measures were collected in Busara "mobile labs" in Bungoma and Kakamega county, which each hold up to 25 participants at a time. The behavioral tasks and some questionnaires were administered using touch screen computers and the zTree experimental interface (Fischbacher 2007) to enable computer-illiterate respondents to participate. Enumerators read instructions to the respondents in Kiswahili to maximize comprehension.[3] At endline, in-

[3]Most Kenyans speak a tribal "mother tongue" at home, Kiswahili as a lingua franca, and English as the language of education and business. The Busara Center uses Kiswahili as the medium of oral communication in most studies with this population.

dividual questionnaires were administered using SurveyCTO. Respondents received KES 200 for participating in the baseline and each intervention session, and KES 300 for participating in the endline session. They were additionally given a KES 50 bonus for arriving on time for the session. Participants were reimbursed for their transport costs from their home to the mobile laboratory.[4]

All participants recruited to the sample were invited to attend endline sessions, regardless of whether they attended the baseline and/or intervention sessions.

**Treatment 1: Time Preferences + Information module ("TP")** This treatment arm was designed to affect participants' time preferences. The design was inspired by previous work in Turkish primary schools (Alan and Ertac 2018), as well as theoretical work (Gabaix and Laibson 2017) on imperfect forecasting and as-if discounting. The idea is that temporal discounting results from the fact that the future feels vague and distant, while the present is salient and tangible. Through interactive lectures, case stories, exercises and drawings, participants were encouraged to a) connect their present behavior to outcomes in the future, b) visualize alternative realizations of the future, depending on their current behaviour, and c) put themselves in the shoes of their future selves, imagine how they feel, and 'talk' to them. While the script was written to make the future more tangible, the intervention carefully avoided changing participants' beliefs about which present behaviour would entail which future outcome - it merely encouraged them to make the connection themselves. To distinguish the intervention from the "Get Going, Keep Doing"intervention, it also did not include any planning features.

**Information module** The intervention concluded with an information module about the benefits of chlorination. Participants were read information on chlorination and antenatal and postnatal care (ANC/PNC). These behaviors were used as real-world examples of important health behaviors in both active treatment arms.

[4]USD 1 was equivalent to approximately KES 100 at the time of the study.

**Treatment 2: Executive Function + Information module ("EF")** This intervention targets whether people actively make and execute plans. The focus is specifically economic: while the psychological literature focuses largely on the *ability* to plan, we also consider whether an individual chooses to make a plan and execute it (Dean, Schilbach, and Schofield). Put differently, our intervention trained respondents how to make plans and stick to them. We took inspiration from common treatments for depression, which have recently focused on encouraging patients to make and execute plans. We draw on a one-session manual for low-intensity behavioral activation called "Reach Out" (Richards and Whyte 2011), drawn from a clinical trial of depression management in the UK (Richards et al. 2008)[5]. The intervention gives participants tools to make clear plans and set goals, establish routines, and reduce avoidance, thus targeting as much as possible the actual act of undertaking planning. We used the same teaching tools as the TP intervention to teach participants that people sometimes become stuck in inactivity and avoid important tasks, which can have negative effects on functioning. They listen to a story of a similar woman in this position and share similar stories and possible solutions from their lives. They then make lists of pleasurable, mandatory, and important activities, rank them from most to least difficult, and schedule them in a weekly diary. In the second session, they cross off completed plans and circle uncompleted ones, and discuss barriers they faced and ways to overcome them.

The intervention concluded with the same information module described above.

**Treatment 3: Placebo exercise "Nature in Kenya" + Information Module ("INF")** A third group attended baseline laboratory sessions and received an intervention titled "Nature in Kenya". The goal of this intervention was to control for any effects of simply attending a session and interacting with women from neighboring villages. The sessions followed the format of the

[5]We also included some elements from A Brief Behavioral Activation Treatment for Depression (Lejuez et al. 2011).

two treatment interventions, and hence included a lecture, discussion, some drawing and some list-writing. The content of these sessions centered on the birds and plants of Kenya, a topic chosen intentionally to be psychologically inactive.

In addition, participants in this group also received the same information module as the two active treatment groups described above.

**Pure Control ("PC")** The pure control group received no contact prior to endline, except for the brief demographic questionnaire administered during household recruitment.

### 2.1.2 Outcome Measures

**Self-Efficacy** We measure self-efficacy using the General Self-Efficacy (GSE) scale (Schwarzer and Jerusalem 2010). Our version contains 12 items, 10 from the generic version, and two which are repeated and reversed. Participants are asked to rate the truthfulness of statements such as "I can always manage to solve difficult problems if I try hard enough" on a scale from "never true" (0) to "always true" (5).

**Time Preferences** Following recent criticisms of monetary discounting elicitations (Andreoni and Sprenger 2012; Augenblick, Niederle, and Sprenger 2015), we estimate time preferences over the effort domain. We use the question design from (Augenblick 2017), with a new effort task that is adapted to our field setting in Kenya. Participants make decisions over how many units of effort to supply at varying times (today, tomorrow, 7 days from now and 8 days from now) and piece rates (KES 2, 6 and 10).[6] To consider the possibility that respondents feel obligated to carry out some effort regardless of the wage, we also include a question on how many units of effort participants would supply for no piece rate (just the KES 100 completion bonus explained

[6]During the baseline, participants face one of three different sets of piece rates (KES 2, 6, 10; KES 2, 4, 6; or KES 2, 6, 10, 20). We accout for these differences by including set fixed effects. All participants made choices over the same piece rates during endline, except for the "no piece rate" subsample described below.

below) for a subsample. All questions required a minimum effort allocation of one task to control for the fixed costs of starting.

Effort is supplied in the form of SMS messages to a toll free number administered by the Busara Center. Each SMS is a 30-character numeric string, which must be keyed in with 75% accuracy and takes approximately two minutes to complete. The participants are given a sheet which lists 50 such strings (including a counter), and they complete one string for practice during the session. At the end of the session, one decision (out of 12) is selected to be the "decision that counts": At the selected piece rate and the selected time horizon, participants have to send the exact number of SMS they chose (within a tolerance). If they do, they receive the piece rate payment plus a KES 100 completion bonus. If they fail to implement the decision they made, they lose both the payment for this task and the completion bonus (analogous to Augenblick 2017). Earnings from this task were paid 14 days from the session date, regardless of the selected effort time horizon.

We estimate $\beta^{Effort}$ and $\delta^{Effort}$ following the approach outlined in Augenblick (2017) by assuming quasi-linear utility (linear in money, convex in effort), as well as quasi-hyperbolic discounting. Like Augenblick (2017), we use a power cost of effort function. Following DellaVigna and Pope (2016), we allow for a non-monetary reward $s$, which participants receive for each task in addition to the piece rate. The non-monetary reward captures a range of motives, from norm or sense of duty, to reciprocity towards the employer (for the flat payment), to intrinsic motivation and personal competitiveness. It is motivated by the observation that our participants supply non-zero amounts of effort even for low or zero piece rates at baseline.

Two concerns about the validity of the task arise from the possibilities that participants do not have access to phones, or do not understand the payment scheme. To test for the former, we include a small module in the endline survey in which participants are asked about difficulties accessing a mobile phone, particularly at the times necessary to complete the SMS task. To alleviate the concern that respondents do not understand the incentives, we include three multiple-choice comprehension questions immediately before the

task that ask participants to calculate the payout in different circumstances. Respondents could not participate in the task until they had answered the comprehension questions correctly.

In addition to the effort discounting task, we include a conventional Multiple Price List (MPL) task to measure money discounting. Participants were asked to make 10 choices between payments at earlier or later dates. The payment at the early date was always equal to KES 100, while the payment at the later date increased gradually from KES 110 to KES 300. Each decision was first made in a near time-frame (today vs four weeks from today), and later in a future time-frame (four weeks from todays vs eight weeks from today). The list of decisions is presented in table C.1. Figure **C.2** provides an example of the participant interface for the MPL. One decision was randomly selected to be paid out. As outcome measures from the MPL we estimate $\beta$ and $\delta$ in the quasi-hyperbolic discounting model (Laibson 1997), assuming linearity of utility in money.

**Planning** We measure two aspects of the planning component of executive function. First, to measure the whether people choose to make a plan and follow through on it, we employ the Behavioral Activation for Depression Scale (Kanter et al. 2007). The full questionnaire contains 29 items divided into four subscales/factors: Activation, Avoidance/Rumination, Work/School Impairment, and Social Impairment. We use the short form (BADS-SF) of the scale developed by (Manos, Kanter, and Luo 2011), who carry out item reduction procedures from all subscales until only 9 items remain. In these, participants are asked to identify how much statements about BA were true for them in the past week, including both positive (e.g. "I was an active person and accomplished the goals I set out to do") and negative items (e.g. "There were certain things I needed to do that I didn't do"). Responses range from "not at all" (0) to "completely" (6). Items from subscales other than Activation are reversed before summing to generate a composite score.

Second, to measure the higher-order cognitive skill of ability to plan, we use a common psychological measure, a version of the *Tower of London task*

(TOL; also known as the Stockings of Cambridge task when implemented electronically), which is designed to measure a participant's ability to plan ahead in sequential strategies (Shallice 1982; Phillips et al. 2001). In our computerized version of the Tower of London task, participants see a screen with two parts: on the left side is the word "start" with a picture of three "pegs" and various shapes positioned on the pegs; on the right side is the word "goal" with a similar picture of three "pegs" and the same shapes positioned differently on the pegs. To complete the task, participants must reposition the shapes underneath the "start" on the left to match the "goal" position on the right. They are instructed to complete each round in as few moves as possible, with the minimum number of moves shown as a number on the screen. In addition to a practice round, participants attempt four rounds of increasing complexity, beginning with one shape requiring only one move, and concluding with three shapes in a pattern that necessitates at least four moves. For each trial, we record the number of moves, the time until the participant's first move, the overall time to completion, and whether the problem is solved correctly. In all rounds, participants are limited to a maximum of 20 moves. If this occurs, the round ends and the participant is required to contact a staff member to ensure she understands the task before continuing to the next round. Therefore, the distribution of scores is censored at both ends. Performance on the Tower of London task, for the purpose of establishing construct validity and reliability, is computed as the total number of moves used across the four rounds, the number of rounds completed correctly, and standardized average time to complete rounds. An example of the participant's screen is shown in Figure C.1.

**Sophistication about Time Inconsistency** We adapt a module on sophistication from John (2017). Participants are asked to imagine that they are given ten vouchers for a one-time consumable luxury found in their community, in this case an all-you-can-eat dinner at a *nyama choma* (Kenyan-style barbeque) restaurant, with the condition that the vouchers expire in two years. Then, they state (i) what the *ideal* distribution of this would be across the two

years; (ii) how many of the 10 they will be *tempted* to use in the first year; and (iii) how many they believe they would *actually* use in the first year.

In addition, participants are asked to select the extent to which they agree with three sentences relating to self-control and time consistency. Two of these are negative (e.g "Many of my choices in the past I now regret making") and one positive ("I am willing to give up something that is beneficial for me today in order to benefit more from that in the future").

**Depression** We include the Center for Epidemiological Studies Depression Scale - Revised, a 10-item scale intended for epidemiological research but not clinical diagnosis (Eaton et al. 2004; Radloff 1977). The CESD-R is well validated, including for sub-Saharan African populations (Baron, Davies, and Lund 2017). Participants are asked to identify how often they felt certain emotions in the past week, from "rarely or never" (scored as 0) to "all the time or most of the time" (scored as 3). Eight items indicate greater probability of depression (e.g "I was bothered by things that usually don't bother me") while two which are negative associated with depression (e.g. "I felt hopeful about the future") are reversed for scoring purposes.

**Risk Preferences** We include a modified Eckel-Grossman task to account for risk preferences (Charness, Gneezy, and Imas 2013). Participants choose between one of three 50/50 lotteries, represented as bets on a coin flip. We assume a CRRA utility function for choices in this task, which allows each choice to be rationalized by an interval of a risk parameter. This is used as a check for a possible alternative mechanism (see section 3.4).

**Chlorination Behavior** During both baseline and endline surveys participants were asked "did you put chlorine in your water in the last month," with reference to popular local brands of chlorine for drinking water, which we use as a binary outcome measure. In addition, participants were visited in their homes to assess chlorination behavior, several days after coming to the laboratory for the endline survey. We test for the presence of both total and free

chlorine; the former indicates the presence of any chlorine in the water while "free" chlorine refers to the residual after some chlorine has combined with nitrates in the water and is therefore unusable for sanitation purposes; therefore, the presence of free chlorine is necessary for the water to be dependably potable (CDC 2010). At the time of home visit, enumerators again asked for self-reported chlorination today and in the last 30 days. They also noted the type of container used for storing drinking water and if it was covered.

**Other Self-Reported Behaviors** Participants completed a demographic survey at endline and additional modules on economic and health behaviors at endline. Relevant elements of these surveys are enumerated in list of outcome variables below.

**Salience and Demand Effects** To test whether our treatments increase the salience of chlorination, we used the following task: participants listen to three lists of nine words read out by an enumerator in a one-on-one setting. After each list, they repeat back any words they remember. Subjects are paid KES 5 for each word they remember to incentivize performance. Each list contains one word related to water chlorination, one related to savings, and one related to farm investment, along with six "filler" words which are designed to be similar in structure as possible to the target words but do not relate to any behavior which is the target of this study. The word lists are available in original Swahili and English translation in table C.2.

# 3. Econometric Approach

## 3.1 Main Specification: Comparing EF and TP to INF

We employ the following main specification:

$$y_{i1} = \alpha_0 + \alpha_1 T_{1i} + \alpha_2 T_{2i} + \delta y_{i0} + \mathbf{\Phi X}_{iv} + \gamma_v + \theta_w + \eta_i \tag{1}$$

Here, $y_{i1}$ is the outcome of interest for respondent $i$ at time of endline, and

$y_{i0}$ is the same outcome variable at time of baseline, if applicable. The sample excludes the PC group, and is further restricted to those participated at least at baseline, the first intervention session, and endline (either survey or home visit, for the relevant outcome measure). Thus, the INF group is the reference category, and $T_{1i}$ and $T_{2i}$ refer to the "Time Preferences" and "Executive Function" groups, respectively. $\mathbf{X}$ represents a vector of participant controls (year of birth, employment status, marital status, education level), $\gamma_v$ are village fixed effects, and $\theta_w$ is an indicator for household wealth greater than the sample median. Standard errors are clustered at the baseline session level, since this was the level of randomization.

Several outcome variables collected at endline were not included at baseline, most prominently the objective measure of chlorination behavior. For these variables we omit $y_{i0}$ from the regressors but restrict the sample similarly. Where only some baseline observations of a variable are missing, we replace the missing values with zero and add a dummy variable indicating such cases, following Jones (1996). In both of our main specifications, we remove outliers by censoring outcome variables at the 1 / 99% level.

## 3.2 All Treatment Arms

We use the following specification to compare all active treatment arms to the "pure control" group:

$$y_{iv} = \beta_0 + \beta_1 T_{1i} + \beta_2 T_{2i} + \beta_3 T_{3i} + \mathbf{\Phi X}_{iv} + \gamma_v + \theta_w + \varepsilon_{iv} \tag{2}$$

Here, $y_{iv}$ is the outcome of interest for respondent $i$ in village $v$ at time of endline. $T_j$ are indicators for assignment to the TP, EF, and INF groups, respectively. The pure control arm is therefore the reference category, and the $\beta$ parameters are the treatment effects. $\mathbf{X}$ represents a vector of participant controls (year of birth, employment status, marital status, education level), $\gamma_v$ are village fixed effects, and $\theta_w$ is an indicator for household wealth greater than the sample median. All recruited participants for whom we recorded the outcome of interest, either during the endline survey or home visit, are

included in this specification. Standard errors in each regression are clustered at the baseline session level, since this was the level of randomization. .

Since the sample of this specification includes both compliers and non-compliers, we run two regressions per outcome variable: one is ordinary least squares (the "intent-to-treat" estimate), and a model in which treatment status is instrumented with treatment assignment (the "treatment on the treated" estimate). We consider all those in any non-pure control group, including the placebo group, who attended at least the initial baseline session, though not necessarily the second intervention session, to be complying with treatment assignment.

**WASH Benefits Cross-Randomization**

Since our treatment arms cross-cut the randomization of the WASH Benefits study described above, we are able estimate both the long-run impacts of those treatments and the differential effects of our treatments in conjunction with the "Water Quality" (chlorine dispenser) intervention. To do so, we run both specifications 2 and 1 with an indicator variable for treatment status (treatment/control) in the "Water Quality" arm of the WASH Benefits study, and this indicator interacted with the treatment assignments in the present experiment. The outcome variable of primary interest in these specifications is an indicator for objective chlorination, with self-reported behavior run as a secondary variable of interest.

Due to an error in sampling, some participants in Mumias Constituency of Kakamega County were drawn from treatment arms of the WASH Benefits study other than "Water Quality" or "Passive Comparison" (approximately 20% of the sample, see Section 2.1). We include these participants in the WASH regressions, grouped by whether their treatment arm received chlorine dispensers or not (this is the case for arms which received "Water Quality, Sanitation and Handwashing" and "Water Quality, Sanitation and Handwashing and Nutrition"). We exclude these participants in a robustness check (see Tables C.9, C.10, C.11, and C.12.

## 3.3 Multiple Hypothesis Testing (MHT) Correction

We use a stepdown procedure to adjust p-values for the false discovery rate (FDR) among a group of outcomes, and report the resulting "q-values" (Anderson 2008). Indices are constructed following (Anderson 2008). We adjust for multiple hypothesis testing within outcome groups (psychological mechanisms and behaviors) and hierarchical categories (primary and secondary), but not across. Similarly, we consider the effects of our two active interventions to be theoretically distinct and therefore do not correct across them.

## 3.4 Other analyses

1. **Randomization Check:** To determine whether randomization was successful, we estimate our main equation with the following demographics as outcome variables: age, years of education, marital status and location (village).

2. **Selective Attrition:** To test for differential attrition by treatment, we regress whether the participant was present at endline on treatment assignment, using equation 3 below.

$$attrit_i = \beta_0 + \sum_{j=1}^{3} \beta_j T_{ji} + \varepsilon_i \tag{3}$$

   Here, $T_j$ refers to treatment assignment. In addition, equation 4 assesses whether attriting individuals are different in terms of the demographics described above and other control variables.

$$attrit_i = \beta_0 + \beta_1 \mathbf{X_i} + \varepsilon_i \tag{4}$$

   $X_i$ represents a vector of controls collected at baseline, as described in the randomization check.

3. **Selective Compliance:** Though participants had no way of knowing their treatment assignments prior to arriving for the session, we test for

differential compliance across treatment groups using equation 5:

$$comply_i = \alpha_0 + \sum_{j=1}^{2} \alpha_j T_{ji} + \omega_i \tag{5}$$

Here, $comply_i$ is an indicator for whether the participant came to at least the initial treatment session. Note that this specification only includes those in the placebo and two treatment arms, not those in the pure control group.

4. **Mechanisms:** We examine whether our treatments influenced chlorination behavior through mechanisms other than time preferences, self-efficacy, or executive function, using the following measures:

   (a) **Salience of chlorination (Demand Effects):** We test for the possibility that our treatments differentially increased salience of water chlorination using equation 6:

   $$w_{im} = a_0 + \sum_{j=1}^{3} a_j T_{ji} + \psi_0 X_{im} + \delta_m + \theta_{im} \tag{6}$$

   Where $w_{im}$ is an indicator for participant $i$ correctly recalling the word related to chlorine in list $m$; $X_{im}$ refers to the number of words that the individual correctly recounted from that list; $\delta_m$ is a fixed effect for list $m$ (there are three lists); and $T_j$ are treatment indicators. We test $H_0 : \alpha_1 = \alpha_2 = \alpha_3$, with the null hypothesis corresponding to no differential salience of chlorine across (active) treatment groups.

      i. In case our treatments differentially affected the salience of chlorine, we further test whether this is due to an increased salience of future-oriented behaviours in general - which may result from our main psychological mechanisms of interest. To this end, we estimate whether the differential treatment effect on chlorine words also holds for two other future-oriented be-

haviours (saving and farm investment), which were not emphasized in the sessions. We estimate

$$w_{imn} = a_0 + \sum_{j=1}^{3} a_j T_{ji} + \lambda chlorine_n + \psi X_{im} + \sum_{k=1}^{3} b_k T_{ki} \cdot chlorine_n + \delta_m + \theta_{imn} \tag{7}$$

where $w_{imn}$ is an indicator for participant $i$ correctly recalling the words in list $m$ from future oriented behaviour $n$ (chlorination, savings or farm investment); and $chlorine_n$ is a dummy for the word being related to chlorine. The $a_j$ coefficients capture increased future orientation due to treatment, while the $b_j$ coefficients indicate that salience increased differentially for chlorination. We test $H_o : b_1 = b_2 = b_3$, with the null hypothesis corresponding to no differential salience of chlorine across (active) treatments.

(b) **Risk Preferences:** To test for the possibility that the treatments unintentionally affect risk preferences, we include a modified Eckel-Grossman measure of risk preferences during the endline survey (Charness, Gneezy, and Imas 2013). Assuming a constant relative risk aversion utility function, we are able to estimate for the curvature parameter for each participant. We take the midpoint of this interval as our estimate for risk preferences. We use the main specifcations described above to assess treatment effects on risk preferences.

(c) **Beliefs about effectiveness of chlorination:** It is possible that the treatments change participants' beliefs about the effectiveness of chlorination in preventing disease. We test this hypothesis by assessing differential beliefs across treatment groups about the proportion of pediatric diarrhea cases which can be prevented by water chlorination. At baseline, all participants in the active treatment arms ("Imagining the Future", "Get Going, Keep Doing", and Placebo) are told that water chlorination reduces childhood

diarrhea by approximately one third. At endline they are asked this question in a multiple choice format. We take the proportion of cases the participant believes chlorine can avert as a measure of belief about chlorine effectiveness. We regress this measure on our treatment groups using the main specifications described in section 3.1.

(d) **Knowledge about how to use chlorine**: It is possible that our treatments can affect chlorination just by providing more information about how to properly use it. We ask two multiple-choice questions at endline, to which all three groups were told the correct answer at baseline:

i. How much chlorine to add to water;

ii. The amount of time that needs to pass after adding chlorine for water to be safe to drink;

We score each question as a binary measure of whether the participant answered correctly and create a composite which ranges from 0 to 2. We test differential knowledge across treatment groups using our main specifications described in section 3.1.

# 4. Results

We present three main sets of results: first, a comparison of the TP and EF treatments to the INF group; second, a comparison of these three groups to the pure control group; and finally, separate analyses in villages with chlorine dispensers vs. villages without dispensers, and the corresponding interaction terms with our treatment arms.

Table 1 shows results from estimating equation 1. The leftmost column shows the dependent variables, grouped into primary and secondary psychological and behavioral outcomes. Column (1) shows the information group mean. The pure control group is excluded. Columns (2) and (3) show the treatment effects for the TP and EF groups, respectively, column (4) is a test

of equality between these two coefficients, and column (5) shows the sample size, which varies slightly across rows because some respondents did not answer a small number of questions; some questions are restricted to certain respondent groups, e.g. those with children; and some observations are removed in trimming as described in 3.1.

Our primary pre-specified psychological outcomes are the present bias coefficient in the effort task, and the Behavioral Action Score (BADS). We find a weak effect of EF on the BADS score, suggesting that this treatment did affect the psychological outcome it was designed to move. However, the effect is relatively small, at 0.09 SD, and only significant at the 10 percent level using naïve $p$-values. TP does not affect the BADS score, which is not surprising given that the intervention is not designed for this purpose.

We also find some effects on secondary psychological outcomes. In particular, both interventions affect the General Self-Efficacy (GSE) scale, suggesting that they both increase self-efficacy. The effect sizes are 0.14 SD for both TP and EFand both are highly significant both before and after adjustment for multiple comparisons. We also find an effect of the EF intervention on the total number of moves required to complete the TOL task, significant at the 5 percent level without adjusting for multiple comparisons and at the 10 percent level with adjustment. Because this task measures planning, the EF intervention thus moved the outcome it was theoretically designed to affect. Neither intervention affected measures of time preference significantly, and the treatment effect coefficients are small in magnitude.

Finally, we tested the effect of our interventions on a number of exploratory psychological outcomes. As shown in Table 3, we find EF induces a large (0.26 SD) decrease in depression scores as measured by the CESD depression scale. This effect is consistent with the origins of the intervention, which was originally designed as a behavioral activation intervention for depression. We also find that TP affects self-perceptions of present bias and self control. We find a large effect size of 0.19 SD, significant at the 1 percent level both before and after adjustment for multiple comparisons. This suggests that either TP does have an effect on time preferences which is not captured by the

monetary- or effort-based measures, or that TP has an effect on own beliefs of time preferences and self-control, without actually affecting time preferences themselves.

Thus, it appears that EF had positive effects on measures of executive function and depression, but not on time preferences. The TP intervention had no strong effects on any outcome variables other than self-efficacy and the measures of sophisticated time inconsistency. These findings are consistent with the view that beliefs can be changed more readily than preferences, although note that we cannot rule out that the time preferences intervention was simply not as persuasive as the EF treatment.

Table 2 shows results from estimating equation 2, which compares both treatment arms and the information arm to the pure control group. Because this comparison is less precisely estimated than 1 due to the omission of some fixed effects and control variables, it is not surprising that most of the effects that are statistically significant in the comparison to placebo are not statistically significant in this specification. One notable exception is the depression score as measured by the CESD scale, shown in Table 4, which shows a significant reduction in both TP and EF relative to pure control. Additionally, both interventions and the information arm reduce present bias as measured by the effort task. Note, however, that we do not take this result as seriously as the corresponding result in Table 1 because the pure control group was never previously exposed to this task, and showed lower comprehension scores than those who had experienced this task at baseline.

Turning to behavioral outcomes, we find that the time preference intervention leads to a 4 percentage point increase in the presence of free chlorine in household drinking water in the comparison to the information group (Table 1), measured with chlorine test kits, which just fails to reach significance at the 10 percent level. This result is confirmed in self-reports, which are significant at the 10 percent level.[7] A 1 percentage point increase in the EF group

[7]A self-report question on whether households treated their water in any way to make it safe to drink generated 99% affirmative responses in all groups, likely owing to a demand effect; we therefore do not show this outcome in the tables. Further, while 25% of the sample had 'total chlorine residual' present in their water (which indicates that chlorine

is not statistically significant. However, in comparsion to the pure control group (Table 2), both treatments show a significant and large increase in the objective measure of chlorination: 6 and 4 percentage points for TP and EF, respectively, which corresponds to 27 and 18 percent increases relative to the pure control group mean of 22 percent chlorination. This difference in significance relative to the information vs. pure control group comparisons suggests that a combination of group meetings and the provision of some information on the benefits of chlorination (recall that the information module was administered to all groups) may work in conjunction with our interventions to affect chlorination behavior.

Among the secondary behavioral outcomes, we find only a reduction in total work hours induced by EF relative to INF (Table 1), but it does not survive multiple inference correction. We also find this reduction in work hours in the comparison of EF to pure control (Table 2), significant at the 5 percent level for naïve $p$-values, and at the 10 percent level following multiple hypothesis correction. Both EF and INF show an increase in the measure of investment in children's education, significant at the 10 percent level.

Finally, we find a range of effects of the interventions on the exploratory behavioral outcomes (Tables 3 and 4). Importantly for our purpose of affecting health behaviors through psychological interventions, both treatments result in a large and statistically significant reduction in the incidence of diarrhea among children. Relative to INF, TP results in a 32 percent reduction, and EF a 27 percent reduction, in the number of episodes of diarrhea among children. This is consistent with our findings that TP and EF increase chlorination, since chlorination kills the bacteria in water which cause diarrhea. This effect is also found relative to the pure control group, with a 30 percent reduction for TP and a 25 percent reduction for EF.

Further, the TP treatment results in a 25 percent increase (9 percentage points) in the proportion of people who save regularly relative to the INF

had definitely been added), only 21% of the sample had 'free chlorine residual', the measure which indicates that sufficient unreacted chlorine remains in the water to make it safe to drink. This suggests that these households are not following correct chlorination practices.

group, and a 38 percent increase (12 percentage points) relative to the pure control group, statistically significant at the 1 percent level, including following multiple hypothesis correction. These effects extend to saving for productive investment (business, farming or education), which are also statistically significant at the 1 percent level, before and after correction. TP also results in a 47 percent increase (8 percentage points) in saving for productive investment relative to INF, and a 53 increase (9 percentage points) relative to the pure control. These findings are fully consistent with the intervention's aim of increasing patience and reducing present bias.

Relatedly, we find that TP increases the number of hours spent on businesses by 0.1 SD, and total expenditure on businesses by 0.1 SD, significant at the 10 percent and 5 percent level, respectively. This finding is also in line with the intervention's goal to reduce present bias and thereby increase investment in the present for results in the future. These results are not observed relative to the pure control group. We find an increase of 0.12 SD in the measure of family planning relative to INF, significant at the 5 percent level, suggesting TP increases preferences for delaying and spacing the birth of children. Finally, we see statistically significant effects across all treatment groups in purchases of agricultural inputs, particularly in expenditure on seeds.

In sum, we find psychological effects of our interventions that are partly in line with their theorized effects; in particular, EF appears to affect executive function as measured by BADS and TOL, as well as self-efficacy. In contrast, TP does not strongly affect its theorized psychological target, i.e. time preferences. Both interventions improve chlorination behavior, but only relative to the pure control group and not relative to information. However, we see evidence of other behavioral effects in our exploratory outcomes, most notably in savings and reduction in diarrhea among children.

We next ask whether these treatment effects differ by whether or not the village in which the interventions took place was treated with a chlorine dispenser in the WASH Benefits study that preceded ours. Tables C.4

and 5 show results from the two main estimating equations, but now separately for WASH control villages (columns (1)–(5)) and WASH treatment

villages (columns (6)–(10)). The interaction terms on our two treatment arms with the WASH treatment (i.e. chlorine dispensers) are shown in columns (11) and (12) for TP and EF, respectively.

We find some evidence of an interaction of our interventions with the dispenser treatment. We find differential treatment effects on objective measures of chlorination, suggesting that at least the information treatment is more sucessful in increasing chlorination (relative to pure control) in villages with chlorine dispensers. There is also some suggestive evidence of differential impacts by dispenser status on patience, but we hesitate to interpret these differences confidently because they lack theoretical motivation.

Finally, we ask whether our results may have been driven by alternative mechanisms, namely treatment effects on beliefs about the efficacy of chlorine, on knowledge of how to chlorinate water, or on risk preferences. We find that all three intervention groups, TP, EF, and INF, increase beliefs in the efficacy of chlorine to a similar magnitude (by 0.12, 0.15, and 0.12 SD respectively; Table ). If increased beliefs in the efficacy of chlorination were the key mechanism behind our results, then all three treatment arms should affect chlorination rates to a similar degree. In contrast, the INF treatment did not significantly affect chlorination rates, and the effect of TP was larger than that of EF. The larger treatment effect of TP on chlorine is mirrored by an increase in knowledge of chlorine practices. Nevertheless, knowledge about chlorination practices does not differ between EF and INF, which again contrasts with our observed treatment effects on chlorination. This suggests that knowledge is also not the key driving mechanism behind the differential treatment effects we observe. Finally, we see no effect of any intervention on risk preferences, suggesting that changes in behavior are not the result of an increase in risk aversion.

# 5. Conclusion

In this randomized experiment, we study the effect of two light-touch interventions on psychological and behavioral outcomes among young women in

Kenya. Specifically, we ask whether a "Time Preferences" intervention reduces present bias and/or increases patience, and whether an "Executive Function" intervention improves behavioral activation and executive control. We find evidence for an effect of EF on the psychological constructs it targets, but little evidence of an effect of the TP intervention on time preferences. Both interventions affect our primary behavioral outcome, chlorination of drinking water, relative to the pure control group, as well as the number of diarrhea episodes in children and a number of other outcomes.

These results suggest that light-touch psychological interventions have the potential to move intermediate psychological outcomes, as well as distal behavioral outcomes, in developing country contexts. The fact that we found stronger effects on psychological outcomes in the EF intervention than in the TP treatment may indicate that preferences are more difficult to move than psychological constraints such as executive function, and than beliefs about one's own abilities. In support of this view, both interventions affected self-efficacy, which is a set of beliefs about one's own abilities, even though the interventions were not primarily designed for this purpose. Both interventions affected chlorination and the incidence of diarrhea in comparison to the pure control group. This finding further suggests that a change in beliefs, e.g. about one's ability to affect health outcomes through chlorination, may be sufficient to move behavioral outcomes, even in the absence of a chance in underlying preferences. Future work may attempt to replicate these effects to shore up their statistical power, and extend the use of our interventions to other settings and behaviors of interest.

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Table 1: Active treatments vs. placebo

| | (1) INF Treatment Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) TP = EF $p$-value | (5) $N$ |
|---|---|---|---|---|---|
| *Primary psychological outcomes* | | | | | |
| Behavioral Activation Score (BADS) | 30.14 | 0.12 | 0.50 | 0.18 | 2329 |
| | (5.42) | (0.27) | (0.27)* | | |
| | | [1.00] | [0.15] | | |
| $\beta^{Effort}$ | 1.00 | −0.00 | 0.00 | | 2318 |
| | (0.00) | (0.00) | (0.00) | | |
| | | [1.00] | [0.83] | | |
| *Secondary psychological outcomes* | | | | | |
| Tower of London: Total Moves | 21.29 | 0.02 | −0.62 | 0.05** | 2372 |
| | (6.71) | (0.32) | (0.30)** | | |
| | | [1.00] | [0.09]* | | |
| General Self-Efficacy Score (GSE) | 43.54 | 1.50 | 1.51 | 0.98 | 2321 |
| | (11.05) | (0.55)*** | (0.50)*** | | |
| | | [0.03]** | [0.01]** | | |
| $\beta^{MPL}$ | 0.98 | 0.02 | 0.02 | 0.96 | 2295 |
| | (0.31) | (0.02) | (0.02) | | |
| | | [0.62] | [0.29] | | |
| $\delta^{MPL}$ | 0.98 | −0.00 | −0.00 | 0.82 | 2372 |
| | (0.02) | (0.00) | (0.00) | | |
| | | [0.69] | [0.38] | | |
| $\delta^{Effort}$ | 1.00 | −0.00 | −0.00 | | 2317 |
| | (0.00) | (0.00) | (0.00) | | |
| | | [0.44] | [0.16] | | |
| *Primary behavioral outcomes* | | | | | |
| Objective measure: water has been treated with chlorine | 0.23 | 0.04 | 0.01 | 0.15 | 2268 |
| | (0.42) | (0.02) | (0.02) | | |
| *Secondary behavioral outcomes* | | | | | |
| Amount saved regularly (per week) | 79.78 | 13.40 | 4.13 | 0.33 | 2365 |
| | (188.81) | (9.03) | (9.43) | | |
| | | [0.71] | [1.00] | | |
| Total hours of work in last 3 months | 95.90 | −1.37 | −16.57 | 0.08* | 2364 |
| | (156.22) | (8.37) | (7.72)** | | |
| | | [1.00] | [0.11] | | |
| Index of investment in children's education | 0.00 | −0.03 | −0.01 | 0.62 | 1532 |
| | (0.81) | (0.05) | (0.05) | | |
| | | [1.00] | [1.00] | | |

*Notes:* Column 4 reports the p-value of the t-test of equality between the treatment effects of TP and EF. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 2: Active treatments & placebo vs. pure control (ITT)

| | (1) Pure Control Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) TP = EF $p$-value | (6) TP = EF = INF $p$-value | (7) $N$ |
|---|---|---|---|---|---|---|---|
| *Primary psychological outcomes* | | | | | | | |
| Behavioral Activation Score (BADS) | 29.95 | 0.11 | 0.53 | 0.03 | 0.15 | 0.17 | 2902 |
| | (5.31) | (0.31) | (0.31)* | (0.30) | | | |
| | | [0.56] | [0.05]** | [0.86] | | | |
| $\beta^{Effort}$ | 1.00 | −0.01 | −0.00 | −0.00 | | | 2876 |
| | (0.00) | (0.00)*** | (0.00)*** | (0.00)*** | | | |
| | | [0.00]*** | [0.00]*** | [0.00]*** | | | |
| *Secondary psychological outcomes* | | | | | | | |
| Tower of London: Total Moves | 23.86 | −0.17 | −0.83 | −0.15 | 0.05* | 0.06* | 2955 |
| | (6.79) | (0.51) | (0.51) | (0.50) | | | |
| | | [1.00] | [0.50] | [1.00] | | | |
| General Self-Efficacy Score (GSE) | 43.46 | 0.93 | 1.02 | −0.45 | 0.85 | 0.01*** | 2899 |
| | (9.53) | (0.78) | (0.68) | (0.74) | | | |
| | | [1.00] | [0.50] | [1.00] | | | |
| $\beta^{MPL}$ | 0.99 | −0.01 | −0.01 | −0.02 | 0.92 | 0.75 | 2869 |
| | (0.37) | (0.03) | (0.03) | (0.03) | | | |
| | | [1.00] | [1.00] | [1.00] | | | |
| $\delta^{MPL}$ | 0.98 | 0.00 | 0.00 | 0.00 | 0.94 | 0.94 | 2955 |
| | (0.02) | (0.00) | (0.00) | (0.00) | | | |
| | | [1.00] | [1.00] | [1.00] | | | |
| $\delta^{Effort}$ | 1.00 | 0.00 | −0.00 | 0.00 | | | 2877 |
| | (0.00) | (0.00) | (0.00) | (0.00) | | | |
| | | [1.00] | [0.59] | [1.00] | | | |
| *Primary behavioral outcomes* | | | | | | | |
| Objective measure: water has been treated with chlorine | 0.22 | 0.06 | 0.04 | 0.03 | 0.24 | 0.33 | 2839 |
| | (0.42) | (0.02)*** | (0.02)* | (0.02) | | | |
| *Secondary behavioral outcomes* | | | | | | | |
| Amount saved regularly (per week) | 79.74 | 8.23 | 0.46 | −3.85 | 0.42 | 0.39 | 2946 |
| | (201.14) | (10.87) | (10.82) | (10.35) | | | |
| | | [1.00] | [0.47] | [0.90] | | | |
| Total hours of work in last 3 months | 103.75 | −6.18 | −21.15 | −5.20 | 0.09* | 0.08* | 2945 |
| | (173.22) | (9.98) | (9.27)** | (8.79) | | | |
| | | [1.00] | [0.07]* | [0.90] | | | |
| Index of investment in children's education | −0.05 | 0.07 | 0.09 | 0.09 | 0.63 | 0.86 | 1927 |
| | (0.69) | (0.05) | (0.05)* | (0.05)* | | | |
| | | [1.00] | [0.08]* | [0.40] | | | |

*Notes:* Column 5 reports the p-value of the t-test of equality between the treatment effects of TP and EF. Column 6 reports the p-value of the F-test of equality between all three treatment effects. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

# Table 3: Active treatments vs. placebo: exploratory outcomes

| | (1) INF Treatment Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) TP = EF $p$-value | (5) $N$ |
|---|---|---|---|---|---|
| *Exploratory Variables Psychology* | | | | | |
| CESD Total | 14.26 | −0.25 | −1.05 | 0.00*** | 2341 |
| | (4.10) | (0.25) | (0.24)*** | | |
| | | [0.13] | [0.00]*** | | |
| Sophisticated Time Inconsistency Self Report (Tempted - Ideal) | 0.25 | −0.26 | −0.19 | 0.66 | 2357 |
| | (2.53) | (0.15)* | (0.14) | | |
| | | [0.08]* | [0.13] | | |
| Sophisticated Time Inconsistency Self Report (Expected - Ideal) | 0.34 | −0.48 | −0.20 | 0.04** | 2357 |
| | (2.58) | (0.13)*** | (0.13) | | |
| | | [0.00]*** | [0.13] | | |
| *Saving* | | | | | |
| Indicator: Amount saved regularly is positive | 0.36 | 0.09 | −0.02 | 0.00*** | 2387 |
| | (0.48) | (0.02)*** | (0.02) | | |
| | | [0.00]*** | [1.00] | | |
| Number of new ROSCAs joined in last 3 months | 0.17 | 0.03 | 0.00 | 0.22 | 2371 |
| | (0.42) | (0.02) | (0.02) | | |
| | | [0.08]* | [1.00] | | |
| Indicator: Respondent saves for productive investments | 0.17 | 0.08 | −0.01 | 0.00*** | 2387 |
| | (0.38) | (0.02)*** | (0.02) | | |
| | | [0.00]*** | [1.00] | | |
| *Labor* | | | | | |
| Total days of work in last 3 months | 19.20 | 1.10 | −2.05 | 0.04** | 2364 |
| | (27.27) | (1.51) | (1.37) | | |
| | | [1.00] | [0.37] | | |
| Average monthly earnings in last 3 months | 918.00 | 12.37 | −72.68 | 0.45 | 2368 |
| | (2313.19) | (113.03) | (117.28) | | |
| | | [1.00] | [0.37] | | |
| *Health* | | | | | |
| Number of diarrhea incidences per child u15 in last 3 months | 0.22 | −0.07 | −0.06 | 0.77 | 2254 |
| | (0.51) | (0.02)*** | (0.02)*** | | |
| | | [0.02]** | [0.02]** | | |
| Proportion of children u15 vaccinated in last 3 months | 0.23 | 0.01 | −0.03 | 0.06* | 2249 |
| | (0.36) | (0.02) | (0.02) | | |
| | | [0.47] | [0.30] | | |
| Number of ANC visits made in last 3 months (among pregnant women) | 1.24 | −0.29 | −0.16 | 0.67 | 230 |
| | (1.18) | (0.32) | (0.35) | | |
| | | [0.33] | [0.47] | | |
| Number of children u15 taken for healthcare check-up in last 3 months | 0.21 | −0.04 | −0.02 | 0.44 | 2253 |
| | (0.35) | (0.02)** | (0.02) | | |
| | | [0.06]* | [0.31] | | |
| *Investment* | | | | | |
| Total asset expenditure in last 3 months | 2922.62 | −69.38 | −282.05 | 0.50 | 2363 |
| | (7135.68) | (334.53) | (343.48) | | |
| | | [1.00] | [0.94] | | |
| Total expenditure on livestock | 1236.50 | −11.35 | −223.96 | 0.27 | 2362 |
| | (4303.47) | (194.74) | (174.94) | | |
| | | [1.00] | [0.94] | | |
| Total expenditure on household durables | 1009.18 | 74.30 | 101.51 | 0.85 | 2362 |
| | (2444.89) | (153.44) | (144.55) | | |
| | | [1.00] | [0.94] | | |
| *Agriculture* | | | | | |
| Total expenditure on fertilizer, seeds, pesticide and plots | 1837.75 | −106.99 | −143.90 | 0.72 | 2361 |
| | (2232.43) | (103.18) | (107.75) | | |
| | | [1.00] | [1.00] | | |
| Indicator: respondent has purchased or leased a plot in last 3 months | 0.26 | 0.03 | −0.00 | 0.13 | 2387 |
| | (0.44) | (0.02) | (0.02) | | |
| | | [1.00] | [1.00] | | |
| Total expenditure on fertilizer in last 3 months | 1063.52 | −37.24 | −23.02 | 0.84 | 2361 |
| | (1561.85) | (73.41) | (81.78) | | |
| | | [1.00] | [1.00] | | |
| Total expenditure on seeds in last 3 months | 684.66 | −35.15 | −22.41 | 0.77 | 2364 |
| | (848.76) | (46.13) | (44.75) | | |
| | | [1.00] | [1.00] | | |
| Total expenditure on pesticide in last 3 months | 9.47 | −1.30 | −2.74 | 0.45 | 2363 |
| | (40.94) | (2.17) | (2.34) | | |
| | | [1.00] | [1.00] | | |
| Total expenditure on leasing plots in last 3 months | 966.69 | 40.05 | −47.51 | 0.38 | 2366 |
| | (2331.00) | (100.07) | (100.15) | | |
| | | [1.00] | [1.00] | | |
| *Business* | | | | | |
| Average daily hours spent on all businesses | 1.31 | 0.31 | 0.09 | 0.19 | 2371 |
| | (2.90) | (0.17)* | (0.15) | | |
| | | [0.07]* | [1.00] | | |
| Total expenditure on all businesses in last 30 days | 969.39 | 321.61 | 45.90 | 0.09* | 2364 |
| | (3063.55) | (148.72)** | (166.55) | | |
| | | [0.07]* | [1.00] | | |
| *Family Planning* | | | | | |
| Index of family planning measures | −0.03 | 0.11 | −0.01 | 0.02** | 2341 |
| | (0.93) | (0.05)** | (0.05) | | |

*Notes:* Column 4 reports the p-value of the t-test of equality between the treatment effects of TP and EF. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 4: Active treatments & placebo vs. pure control: exploratory outcomes

| | (1) Pure Control Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) TP = EF $p$-value | (6) TP = EF = INF $p$-value | (7) $N$ |
|---|---|---|---|---|---|---|---|
| *Exploratory Variables Psychology* | | | | | | | |
| CESD Total | 14.49 | −0.37 | −1.19 | −0.10 | 0.00*** | 0.00*** | 2917 |
| | (4.11) | (0.24) | (0.23)*** | (0.25) | | | |
| | | [0.13] | [0.00]*** | [0.85] | | | |
| Sophisticated Time Inconsistency Self Report (Tempted - Ideal) | −0.06 | −0.01 | 0.10 | 0.28 | 0.48 | 0.14 | 2934 |
| | (2.70) | (0.16) | (0.15) | (0.15)* | | | |
| | | [0.47] | [0.72] | [0.28] | | | |
| Sophisticated Time Inconsistency Self Report (Expected - Ideal) | 0.24 | −0.33 | −0.07 | 0.12 | 0.05** | 0.00*** | 2934 |
| | (2.85) | (0.15)** | (0.15) | (0.15) | | | |
| | | [0.08]* | [0.72] | [0.74] | | | |
| *Saving* | | | | | | | |
| Indicator: Amount saved regularly is positive | 0.32 | 0.12 | 0.01 | 0.03 | 0.00*** | 0.00*** | 2972 |
| | (0.47) | (0.03)*** | (0.03) | (0.02) | | | |
| | | [0.00]*** | [1.00] | [0.42] | | | |
| Number of new ROSCAs joined in last 3 months | 0.21 | 0.00 | −0.02 | −0.03 | 0.22 | 0.32 | 2956 |
| | (0.46) | (0.03) | (0.02) | (0.02) | | | |
| | | [0.43] | [1.00] | [0.42] | | | |
| Indicator: Respondent saves for productive investments | 0.17 | 0.09 | 0.00 | 0.01 | 0.00*** | 0.00*** | 2972 |
| | (0.38) | (0.02)*** | (0.02) | (0.02) | | | |
| | | [0.00]*** | [1.00] | [0.42] | | | |
| *Labor* | | | | | | | |
| Total days of work in last 3 months | 20.91 | 0.00 | −2.96 | −1.38 | 0.05* | 0.14 | 2944 |
| | (29.26) | (1.69) | (1.57)* | (1.54) | | | |
| | | [1.00] | [0.13] | [1.00] | | | |
| Average monthly earnings in last 3 months | 906.11 | 26.47 | −63.44 | −3.66 | 0.42 | 0.71 | 2945 |
| | (2258.94) | (121.73) | (120.60) | (125.98) | | | |
| | | [1.00] | [0.43] | [1.00] | | | |
| *Health* | | | | | | | |
| Number of diarrhea incidences per child u15 in last 3 months | 0.20 | −0.06 | −0.05 | 0.01 | 0.62 | 0.01*** | 2806 |
| | (0.51) | (0.03)** | (0.03)* | (0.03) | | | |
| | | [0.14] | [0.32] | [1.00] | | | |
| Proportion of children u15 vaccinated in last 3 months | 0.22 | 0.01 | −0.02 | 0.00 | 0.05* | 0.12 | 2800 |
| | (0.36) | (0.02) | (0.02) | (0.02) | | | |
| | | [1.00] | [0.51] | [1.00] | | | |
| Number of ANC visits made in last 3 months (among pregnant women) | 1.19 | −0.27 | −0.06 | 0.23 | 0.51 | 0.32 | 272 |
| | (1.17) | (0.40) | (0.44) | (0.43) | | | |
| | | [1.00] | [0.81] | [1.00] | | | |
| Number of children u15 taken for healthcare check-up in last 3 months | 0.17 | 0.00 | 0.01 | 0.03 | 0.42 | 0.13 | 2806 |
| | (0.31) | (0.02) | (0.02) | (0.02)* | | | |
| | | [1.00] | [0.81] | [0.35] | | | |
| *Investment* | | | | | | | |
| Total asset expenditure in last 3 months | 2352.74 | 390.99 | 227.14 | 477.14 | 0.60 | 0.74 | 2943 |
| | (5000.19) | (319.78) | (298.72) | (346.31) | | | |
| | | [0.50] | [0.81] | [0.27] | | | |
| Total expenditure on livestock | 1051.07 | −4.92 | −202.19 | 23.93 | 0.29 | 0.35 | 2943 |
| | (3740.29) | (213.45) | (198.36) | (204.80) | | | |
| | | [0.50] | [0.81] | [0.43] | | | |
| Total expenditure on household durables | 1212.86 | −211.30 | −186.93 | −289.41 | 0.86 | 0.76 | 2944 |
| | (2812.81) | (164.87) | (152.96) | (160.21)* | | | |
| | | [0.50] | [0.81] | [0.27] | | | |
| *Agriculture* | | | | | | | |
| Total expenditure on fertilizer, seeds, pesticide and plots | 1528.21 | 222.18 | 200.01 | 322.08 | 0.83 | 0.45 | 2943 |
| | (1944.92) | (108.29)** | (110.27)* | (108.54)*** | | | |
| | | [0.19] | [0.21] | [0.02]** | | | |
| Indicator: respondent has purchased or leased a plot in last 3 months | 0.25 | 0.04 | 0.00 | 0.00 | 0.10* | 0.18 | 2972 |
| | (0.44) | (0.02) | (0.02) | (0.02) | | | |
| | | [0.19] | [0.91] | [0.42] | | | |
| Total expenditure on fertilizer in last 3 months | 932.64 | 96.81 | 113.35 | 126.96 | 0.82 | 0.91 | 2944 |
| | (1442.42) | (76.58) | (81.79) | (82.01) | | | |
| | | [0.19] | [0.28] | [0.11] | | | |
| Total expenditure on seeds in last 3 months | 575.69 | 88.58 | 110.13 | 121.95 | 0.61 | 0.76 | 2946 |
| | (788.68) | (45.72)* | (44.53)** | (46.28)*** | | | |
| | | [0.19] | [0.09]* | [0.02]** | | | |
| Total expenditure on pesticide in last 3 months | 5.03 | 2.98 | 1.78 | 4.38 | 0.52 | 0.53 | 2945 |
| | (29.27) | (1.79)* | (1.88) | (2.24)* | | | |
| | | [0.19] | [0.50] | [0.07]* | | | |
| Total expenditure on leasing plots in last 3 months | 853.49 | 166.50 | 50.36 | 103.62 | 0.25 | 0.51 | 2947 |
| | (2100.42) | (113.98) | (112.36) | (113.90) | | | |
| | | [0.19] | [0.65] | [0.22] | | | |
| *Business* | | | | | | | |
| Average daily hours spent on all businesses | 1.58 | 0.11 | −0.13 | −0.21 | 0.14 | 0.16 | 2950 |
| | (3.17) | (0.19) | (0.17) | (0.17) | | | |
| | | [1.00] | [0.76] | [0.29] | | | |
| Total expenditure on all businesses in last 30 days | 1194.85 | 78.75 | −215.47 | −241.92 | 0.07* | 0.06* | 2943 |
| | (3475.90) | (177.45) | (198.77) | (177.83) | | | |
| | | [1.00] | [0.76] | [0.29] | | | |
| *Family Planning* | | | | | | | |
| Index of family planning measures | 0.03 | 0.09 | −0.03 | −0.02 | 0.03** | 0.03** | 2906 |
| | (0.89) | (0.05) | (0.05) | (0.05) | | | |

*Notes:* * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 5: Active treatments & placebo vs. pure control: Dispenser vs. no dispenser villages

| | Village has no chlorine dispenser | | | | | Village has chlorine dispenser | | | | | Comparison | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) Pure Control Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) $N$ | (6) Pure Control Mean (SD) | (7) TP Treatment Effect | (8) EF Treatment Effect | (9) INF Treatment Effect | (10) $N$ | (11) TP Interaction $p$-value | (12) EF Interaction $p$-value | (13) INF Interaction $p$-value |
| *Primary psychological outcomes* | | | | | | | | | | | | | |
| Behavioral Activation Score (BADS) | 30.09 | −0.48 | 0.19 | 0.25 | 1526 | 30.00 | 0.18 | 0.25 | −0.75 | 1345 | [0.17] | [0.83] | [0.00]*** |
| | (5.23) | (0.53) | (0.47) | (0.53) | | (5.20) | (0.55) | (0.51) | (0.57) | | | | |
| | | [1.00] | [1.00] | [1.00] | | | [1.00] | [1.00] | [0.63] | | | | |
| $\beta^{Effort}$ | 1.14 | 0.04 | −0.05 | 0.03 | 1502 | 1.13 | 0.01 | 0.04 | 0.04 | 1318 | [0.05]** | [0.34] | [0.45] |
| | (0.73) | (0.07) | (0.06) | (0.07) | | (0.69) | (0.07) | (0.06) | (0.08) | | | | |
| | | [1.00] | [1.00] | [1.00] | | | [1.00] | [1.00] | [0.63] | | | | |
| *Secondary psychological outcomes* | | | | | | | | | | | | | |
| Tower of London: Total Moves | 23.47 | 0.13 | −0.66 | 0.68 | 1573 | 24.34 | −0.50 | −1.02 | −1.11 | 1382 | [0.44] | [0.25] | [0.32] |
| | (6.92) | (0.71) | (0.71) | (0.70) | | (6.62) | (0.68) | (0.68) | (0.71) | | | | |
| | | [1.00] | [1.00] | [1.00] | | | [1.00] | [0.69] | [1.00] | | | | |
| General Self-Efficacy Score (GSE) | 43.36 | 1.24 | 0.76 | −0.21 | 1517 | 43.40 | 0.60 | 1.20 | −0.59 | 1339 | [0.79] | [0.33] | [0.83] |
| | (9.20) | (1.07) | (0.91) | (0.96) | | (9.53) | (1.13) | (1.02) | (1.12) | | | | |
| | | [1.00] | [1.00] | [1.00] | | | [1.00] | [0.69] | [1.00] | | | | |
| $\beta^{MPL}$ | 1.00 | 0.03 | 0.02 | −0.02 | 1520 | 0.97 | −0.03 | −0.03 | −0.00 | 1337 | [0.48] | [0.50] | [0.00]*** |
| | (0.36) | (0.04) | (0.03) | (0.04) | | (0.37) | (0.04) | (0.03) | (0.04) | | | | |
| | | [1.00] | [1.00] | [1.00] | | | [1.00] | [0.69] | [1.00] | | | | |
| $\delta^{MPL}$ | 0.98 | 0.00 | 0.00 | 0.00 | 1573 | 0.98 | −0.00 | −0.00 | −0.00 | 1382 | [0.01]*** | [0.00]*** | [0.05]* |
| | (0.02) | (0.00) | (0.00) | (0.00) | | (0.02) | (0.00) | (0.00) | (0.00) | | | | |
| | | [1.00] | [1.00] | [1.00] | | | [1.00] | [0.69] | [1.00] | | | | |
| $\delta^{Effort}$ | 1.05 | −0.00 | 0.02 | 0.00 | 1500 | 1.04 | 0.01 | −0.03 | −0.01 | 1321 | [0.15] | [0.13] | [0.33] |
| | (0.40) | (0.04) | (0.03) | (0.04) | | (0.35) | (0.04) | (0.03) | (0.04) | | | | |
| | | [1.00] | [1.00] | [1.00] | | | [1.00] | [0.69] | [1.00] | | | | |
| *Primary behavioral outcomes* | | | | | | | | | | | | | |
| Objective measure: water has been treated with chlorine | 0.23 | 0.04 | 0.02 | −0.01 | 1534 | 0.21 | 0.08 | 0.05 | 0.07 | 1305 | [0.38] | [0.38] | [0.01]** |
| | (0.42) | (0.03) | (0.03) | (0.03) | | (0.41) | (0.03)** | (0.03)* | (0.03)** | | | | |
| *Secondary behavioral outcomes* | | | | | | | | | | | | | |
| Amount saved regularly (per week) | 55.41 | 17.52 | 11.73 | 7.93 | 1553 | 67.56 | 19.85 | 6.86 | 4.71 | 1364 | [0.35] | [0.77] | [0.22] |
| | (108.60) | (9.43)* | (9.42) | (9.67) | | (158.86) | (14.09) | (14.30) | (12.34) | | | | |
| | | [0.24] | [0.43] | [1.00] | | | [0.19] | [0.56] | [0.73] | | | | |
| Total hours of work in last 3 months | 100.30 | −8.92 | −13.94 | −12.53 | 1564 | 88.95 | 3.86 | −13.91 | 13.14 | 1364 | [0.77] | [0.11] | [0.18] |
| | (157.53) | (12.31) | (13.51) | (11.28) | | (154.10) | (13.86) | (11.83) | (12.16) | | | | |
| | | [0.46] | [0.43] | [1.00] | | | [0.35] | [0.44] | [0.39] | | | | |
| Index of investment in children's education | −0.02 | 0.05 | 0.10 | 0.03 | 979 | −0.06 | 0.14 | 0.10 | 0.13 | 909 | [0.11] | [0.36] | [0.17] |
| | (0.65) | (0.06) | (0.07) | (0.06) | | (0.60) | (0.06)** | (0.06) | (0.06)** | | | | |
| | | [0.46] | [0.43] | [1.00] | | | [0.10]* | [0.44] | [0.14] | | | | |

*Notes:* * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 6: Baseline balance

| | (1) Pure Control Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) TP = EF *p*-value | (6) TP = EF = INF *p*-value | (7) *N* |
|---|---|---|---|---|---|---|---|
| *Observables* | | | | | | | |
| Age | 26.62 | −0.38 | −0.40 | −0.25 | 0.92 | 0.78 | 3750 |
| | (4.69) | (0.23) | (0.23)* | (0.23) | | | |
| Married/ Cohabiting | 0.90 | −0.02 | −0.00 | −0.01 | 0.32 | 0.61 | 3750 |
| | (0.30) | (0.01) | (0.02) | (0.02) | | | |
| Education Level | 5.93 | −0.10 | −0.01 | −0.06 | 0.30 | 0.58 | 3750 |
| | (1.08) | (0.07) | (0.07) | (0.06) | | | |
| High Wealth Index | 0.52 | −0.01 | −0.02 | 0.02 | 0.67 | 0.31 | 3750 |
| | (0.50) | (0.03) | (0.03) | (0.03) | | | |
| Village ID | 83.31 | 0.78 | −0.27 | −0.05 | 0.92 | 0.99 | 3750 |
| | (56.43) | (8.17) | (7.77) | (6.95) | | | |

*Notes:* * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 7: Compliance and attrition

| | (1) Control Mean | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) TP = EF = INF *p*-value | (6) TP = EF *p*-value | (7) *N* |
|---|---|---|---|---|---|---|---|
| *Attrition Variables* | | | | | | | |
| Attrited before endline (Against Pure Control) | 0.24 | −0.05 | −0.04 | −0.06 | 0.57 | 0.66 | 3750 |
| | (0.43) | (0.02)** | (0.02) | (0.02)*** | | | |
| Complied with treatment (Against Placebo) | 0.78 | 0.01 | 0.00 | | | 0.80 | 2975 |
| | (0.41) | (0.04) | (0.04) | | | | |

*Notes:* Column 5 reports the p-value of the F-test of equality between the three coefficients of TP, EF and INF. Column 6 reports the p-value of the t-test of equality between the two coefficients of TP and EF. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 8: Active treatments & placebo vs. pure control: Beliefs, Knowledge and Risk

| | (1) Pure Control Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) TP = EF *p*-value | (6) TP = EF = INF *p*-value | (7) *N* |
|---|---|---|---|---|---|---|---|
| *Other possible mechanisms* | | | | | | | |
| Belief: Proportion of diarrhea incidences avoided through chlorination | 0.71 | 0.05 | 0.06 | 0.05 | 0.56 | 0.72 | 2955 |
| | (0.41) | (0.02)** | (0.02)*** | (0.02)** | | | |
| Chlorine Knowledge Score | 1.07 | 0.08 | 0.05 | 0.06 | 0.34 | 0.61 | 2955 |
| | (0.69) | (0.04)** | (0.04) | (0.04) | | | |
| Risk Aversion Measure | 1.70 | 0.02 | −0.00 | 0.03 | 0.67 | 0.67 | 2735 |
| | (0.83) | (0.05) | (0.05) | (0.05) | | | |

*Notes:* Column 5 reports the p-value of the t-test of equality between the treatment effects of TP and EF. Column 6 reports the p-value of the F-test of equality between the treatment effects of all three interventions. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 9: Active treatments & placebo vs. pure control: Salience & Memory Test Outcomes

| | (1) Pure Control Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) Chlorine Word Interaction: TP | (6) Chlorine Word Interaction: EF | (7) Chlorine Word Interaction: INF | (8) TP = EF =INF *p*-value | (9) *N* |
|---|---|---|---|---|---|---|---|---|---|
| Indicator for remembering 'chlorine' word | 0.38 | 0.08 | 0.05 | 0.02 | – | - | – | 0.00*** | 8934 |
| | (0.48) | (0.01)*** | (0.01)*** | (0.01) | – | - | – | | |
| Indicator for remembering 'future' word | 0.32 | −0.00 | 0.00 | −0.01 | 0.08 | 0.05 | 0.03 | 0.01*** | 26802 |
| | (0.47) | (0.01) | (0.01) | (0.01) | (0.02)*** | (0.02)** | (0.02)* | | |
| Total number of words remembered | 12.68 | −0.47 | −0.13 | −0.13 | – | - | – | 0.20 | 2978 |
| | (4.20) | (0.23)** | (0.25) | (0.22) | – | - | – | | |

*Notes:* The specifications control for the total number of words the participant remembered in each list and include a 'chlorine word' fixed effect. The coefficients of the interaction terms show the differential probability of remembering a 'future-related' word if that word is related to chlorine. N refers to the number of words. Column 8 reports the p-value of the F-test of equality between the interaction terms of all three interventions. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

# Appendix

## A. Schedule of Tasks and Treatments

Participants were invited to a 7:30AM or 12:30PM session at a village hall in their area. Sessions lasted between two and four hours. Participants received short breaks between each item on the agenda.

During zTree portions of the session, each participant sat in front of a Windows tablet computer, sufficiently spaced to prevent participants from seeing the answers of their neighbors. One enumerator read instructions and answer options aloud in Kiswahili from the center of the room, while several others were available to answer individual questions or assist with the technology.

During the SurveyCTO questionnaires at endline, five to eight enumerators went through questionnaires with participants individually, in the order that participants arrived.

Interventions were carried out in groups of approximately five, in a circle outside when weather permitted. Groups were physically separated to ensure participants could not be overheard. All participants received the same intervention on a given day.

Baseline Session 1:

At baseline, both the demographic questionnaire and behavioral tasks were carried out on the zTree experimental interface.

1. Welcome, Identification and Screening
2. Consent
3. Demographics Questionnaire
    (a) Marital Staus / Household Composition
    (b) Assets Module
    (c) Water Use
    (d) Chlorination Behavior
    (e) Pregnancy Health Behaviors
4. Tasks
    (a) Tower of London
    (b) Generalized Self-Efficacy

(c) Effort Discounting Task
(d) Monetary Discounting

5. Administration of Intervention Part 1
6. Debrief
7. Payment

Baseline Session 2

1. Welcome, Identification and Screening
2. Adminstration of Intervention Part 2
3. Debrief

Endline

1. Welcome, Identification and Screening
2. Consent
3. Salience Task
4. Group Tasks and Measures
   (a) Behavioral Activation for Depression Scale (BADS)
   (b) Generalized Self-Efficacy (GSE) Scale
   (c) Center for Epidemiological Studies Depression Scale, Reduced Version (CES-D-R)
   (d) Water Use Module
   (e) Chlorination Behavior Module
   (f) ANC/PNC Beliefs
   (g) Tower of London
   (h) Risk Measure
   (i) Effort Discounting Measure
   (j) Monetary Discounting Measure (Multiple Price Lists)
5. Individual Survey

(a) Savings
(b) Business Development
(c) Asset Investment
(d) Labour Supply and Search
(e) Agricultural Inputs & Livestock
(f) Fertility & Antenatal/Postnatal Care
(g) Child Education & Health
(h) Participant Education
(i) Phone Access

# B. List of Outcome Variables

In accordance with the hypotheses above, we divide outcomes variables into psychological mechanisms, behaviors, and tests for alternative mechanisms. The former two are enumerated below while the latter is described in section 3.4. Within the psychological mechanism and behavior groups, we list primary, secondary and tertiary variables of interest. We apply the multiple hypothesis testing described in section 3.3. We adjust for multiple hypothesis testing within outcome groups (psychological mechanisms and behaviors) and hierarchical categories (primary and secondary), but not across hierarchical categories or across outcome groups. Variables marked with * are available at both baseline and endline; the rest are measured only at endline.

1. Psychological Mechanisms
   (a) Primary:
      i. $\beta^{Effort}$ (estimated from the effort discounting task)*
      ii. Behavioral Activation for Depression Scale - Short Form (BADS-SF)
   (b) Secondary:
      i. Generalized Self-Efficacy (GSE) scale*

ii. $\delta^{Effort*}$

iii. $\beta^{MPL\ *}$

iv. $\delta^{MPL*}$

v. Tower of London task (outcome measure: total moves across all four rounds)*

(c) Exploratory:

i. Center for Epidemiological Studies Depression scale, revised version (CESD-R)

ii. Sophisticated Time-Inconsistency Self-Reports ($(tempted-ideal)\cdot \beta^{Effort}$ and $(expected-ideal)\cdot\beta^{Effort}$)

2. Economic and Health Behaviors

(a) Primary: water chlorination (outcome measure: presence of any chlorine in household drinking water)

i. Self-report confirmation: Indicator for any treatment of water*

(b) Secondary:

i. Amount saved regularly (frequency converted to weekly)

ii. Total hours of work in last three months (includes all types of work, such as farming, casual labour, business ownership, or salaried jobs)*

iii. Index of the following measures of investment in education:*

- Indicator for a positive number of school days missed in last 5 days (across all school-age children in the household)
- Total expenditure per child on children's schooling in last three months

(c) Exploratory

i. Savings:

- Binary indicator: Amount saved regularly is positive
- Number of ROSCAs joined in last 3 months

- Indicator: Respondent saves for productive future investment (business, farming, or education)

ii. Labor supply
- Total days of work, paid or unpaid in last three months
- Monthly earnings from any paid work (paid in cash and in-kind)

iii. Health
- Number of diarrhea incidences per child under 15 in the household in the last three months (controlled for number of children under 15 in the household)*
- Secondary
  - Number of children under 15 vaccinated in the last three months (controlling for number of children under 15 in the household)
  - Number of ANC/PNC visits made in last three months (among pregnant women)
  - Number of children under 15 taken for healthcare check-up in last three months (controlling for number of children under 15 in the household)

iv. Investment in productive assets
- Total asset expenditure in last three months, including business investment
- If significant effects are found on the total, we will examine the components
  - Total expenditure on livestock
  - Total expenditure on household durables

v. Investment in agricultural inputs
- Total expenditure on fertilizer, seeds, pesticide and renting plots
- Indicator for purchasing or leasing new agricultural plots in last three months

- If significant effects are found on the total, expenditure (separate) on each component: fertilizer, seeds, pesticide, and renting plots

vi. Business and Enterprise

- Average daily hours spent on all businesses
- Total expenditure on all businesses in last 30 days

vii. Family planning. Index of the following measures:

- Opinion on ideal number of children a woman should have
- Opinion on ideal age gap between children
- Contraceptive use wish indicator: wishing to use contraception or using it currently

# C. Additional Tables and Figures

Table C.1: Temporal Discounting Decisions

| Front-end delay ($t$) | Delay between payments ($k$) | Early ($m$) | Maximum Late ($m(1+r)$) | Implied interest rate ($1+r$) |
|---|---|---|---|---|
| **Frame 1** | | | | |
| 0 | 28 | 100 | 110 | 1.1 |
| 0 | 28 | 100 | 125 | 1.25 |
| 0 | 28 | 100 | 175 | 1.75 |
| 0 | 28 | 100 | 200 | 2 |
| 0 | 28 | 100 | 300 | 3 |
| **Frame 2** | | | | |
| 28 | 28 | 100 | 110 | 1.1 |
| 28 | 28 | 100 | 125 | 1.25 |
| 28 | 28 | 100 | 175 | 1.75 |
| 28 | 28 | 100 | 200 | 2 |
| 28 | 28 | 100 | 300 | 3 |

Table C.2: Word Lists for Salience Test

| List | Position | English Translation | Swahili | Group |
|---|---|---|---|---|
| A | 1 | Fence | Fence | Filler |
| A | 2 | Panadol | Panadol | Filler |
| A | 3 | WaterGuard | WaterGuard | Chlorine |
| A | 4 | Playing | Kucheza | Filler |
| A | 5 | Saving | Kuwekeza | Saving |
| A | 6 | Tarmac | Lami | Filler |
| A | 7 | Dairy Cow | Ng'ombe wa maziwa | Farm Investment |
| A | 8 | Safaricom | Safaricom | Filler |
| A | 9 | Resting | Kupumzika | Filler |
| B | 1 | Patterned Cloth | Kitenge | Filler |
| B | 2 | Theros | Thermos | Filler |
| B | 3 | Savings Group | Chama | Savings |
| B | 4 | Baby Oil | Mafuta ya mtoto | Filler |
| B | 5 | Poultry Farming | Kilimo cha kuku | Farm investment |
| B | 6 | Petrol | Petroli | Filler |
| B | 7 | Chlorine | Klorini | Chlorine |
| B | 8 | Machete | Panga | Filler |
| B | 9 | Shoe Polish | Rangi ya viatu | Filler |
| C | 1 | Saucepan | Sufuria | Filler |
| C | 2 | Stool | Stool | Filler |
| C | 3 | Farm Lease | Kukodisha shamba | Farm investment |
| C | 4 | Transport | Transport | Filler |
| C | 5 | Dispenser | Dispensa | Chlorine |
| C | 6 | Photocopier | Photocopier | Filler |
| C | 7 | Piggybank | Benki ya nyumbani | Savings |
| C | 8 | Airtime | Airtime | Filler |
| C | 9 | Community Hall | Ukumbi wa jamii | Filler |

Table C.3: Active treatments & placebo vs. pure control (TOT)

| | (1) Pure Control Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) TP = EF $p$-value | (6) TP = EF = INF $p$-value | (7) $N$ |
|---|---|---|---|---|---|---|---|
| *Primary psychological outcomes* | | | | | | | |
| Behavioral Activation Score (BADS) | 29.95 | 0.13 | 0.60 | 0.03 | 0.13 | 0.14 | 2902 |
| | (5.31) | (0.34) | (0.33)* | (0.33) | | | |
| *Secondary psychological outcomes* | | | | | | | |
| Tower of London: Total Moves | 23.86 | −0.92 | −1.56 | −0.89 | 0.11 | 0.16 | 2955 |
| | (6.79) | (1.40) | (1.25) | (1.39) | | | |
| | | [1.00] | [1.00] | [1.00] | | | |
| General Self-Efficacy Score (GSE) | 43.46 | 2.05 | 2.01 | 0.49 | 0.95 | 0.01*** | 2899 |
| | (9.53) | (2.15) | (1.85) | (2.11) | | | |
| | | [1.00] | [1.00] | [1.00] | | | |
| $\beta^{MPL}$ | 0.99 | −0.02 | −0.02 | −0.04 | 0.84 | 0.69 | 2869 |
| | (0.37) | (0.06) | (0.05) | (0.06) | | | |
| | | [1.00] | [1.00] | [1.00] | | | |
| $\delta^{MPL}$ | 0.98 | 0.00 | 0.00 | 0.00 | 0.98 | 0.93 | 2955 |
| | (0.02) | (0.00) | (0.00) | (0.00) | | | |
| | | [1.00] | [1.00] | [1.00] | | | |
| *Primary behavioral outcomes* | | | | | | | |
| Objective measure: water has been treated with chlorine | 0.22 | 0.07 | 0.04 | 0.03 | 0.22 | 0.31 | 2839 |
| | (0.42) | (0.02)*** | (0.02)* | (0.03) | | | |
| *Secondary behavioral outcomes* | | | | | | | |
| Amount saved regularly (per week) | 79.74 | 9.31 | 0.48 | −4.35 | 0.39 | 0.36 | 2946 |
| | (201.14) | (11.81) | (11.79) | (11.27) | | | |
| | | [1.00] | [1.00] | [1.00] | | | |
| Total hours of work in last 3 months | 103.75 | −7.04 | −23.96 | −5.92 | 0.08* | 0.07* | 2945 |
| | (173.22) | (10.82) | (10.10)** | (9.60) | | | |
| | | [1.00] | [1.00] | [1.00] | | | |
| Index of investment in children's education | −0.05 | 0.07 | 0.10 | 0.10 | 0.59 | 0.84 | 1927 |
| | (0.69) | (0.05) | (0.05)* | (0.05)* | | | |
| | | [1.00] | [1.00] | [1.00] | | | |

*Notes:* Column 5 reports the p-value of the t-test of equality between the treatment effects of TP and EF. Column 6 reports the p-value of the F-test of equality between all three treatment effects. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table C.4: Active treatments vs. placebo: Dispenser vs. no dispenser villages

| | Village has no chlorine dispenser | | | | | Village has chlorine dispenser | | | | | Comparison | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | (1) INF Treatment Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) TP = EF $p$-value | (5) $N$ | (6) INF Treatment Mean (SD) | (7) TP Treatment Effect | (8) EF Treatment Effect | (9) TP = EF $p$-value | (10) $N$ | (11) TP Interaction $p$-value | (12) EF Interaction $p$-value |
| *Primary psychological outcomes* | | | | | | | | | | | | |
| Behavioral Activation Score (BADS) | 30.60 | −0.59 | 0.12 | 0.07* | 1229 | 29.58 | 0.96 | 0.97 | 0.97 | 1100 | [0.15] | [0.97] |
| | (5.50) | (0.39) | (0.38) | | | (5.29) | (0.41)** | (0.43)** | | | | |
| | | [0.34] | [0.60] | | | | [0.03]** | [0.05]* | | | | |
| $\beta^{Effort}$ | 1.13 | 0.01 | −0.12 | 0.01** | 1224 | 1.15 | −0.13 | −0.03 | 0.03** | 1094 | [0.00]*** | [0.04]** |
| | (0.73) | (0.05) | (0.05)*** | | | (0.84) | (0.06)** | (0.06) | | | | |
| | | [0.70] | [0.02]** | | | | [0.03]** | [0.47] | | | | |
| *Secondary psychological outcomes* | | | | | | | | | | | | |
| Tower of London: Total Moves | 21.52 | −0.46 | −1.27 | 0.09* | 1253 | 21.02 | 0.65 | 0.19 | 0.25 | 1119 | [0.45] | [0.24] |
| | (6.83) | (0.46) | (0.43)*** | | | (6.54) | (0.40) | (0.42) | | | | |
| | | [0.47] | [0.02]** | | | | [1.00] | [1.00] | | | | |
| General Self-Efficacy Score (GSE) | 43.47 | 1.86 | 1.20 | 0.46 | 1221 | 43.63 | 1.10 | 1.70 | 0.41 | 1100 | [0.69] | [0.19] |
| | (11.13) | (0.81)** | (0.74) | | | (10.96) | (0.88) | (0.78)** | | | | |
| | | [0.05]* | [0.16] | | | | [1.00] | [0.19] | | | | |
| $\beta^{MPL}$ | 0.95 | 0.06 | 0.04 | 0.51 | 1214 | 1.01 | −0.03 | −0.01 | 0.60 | 1081 | [0.28] | [0.41] |
| | (0.29) | (0.02)*** | (0.02)* | | | (0.32) | (0.03) | (0.03) | | | | |
| | | [0.05]* | [0.16] | | | | [1.00] | [1.00] | | | | |
| $\delta^{MPL}$ | 0.98 | −0.00 | 0.00 | 0.48 | 1253 | 0.98 | −0.00 | −0.00 | 0.82 | 1119 | [0.01]*** | [0.00]*** |
| | (0.02) | (0.00) | (0.00) | | | (0.02) | (0.00) | (0.00) | | | | |
| | | [0.70] | [0.49] | | | | [1.00] | [1.00] | | | | |
| $\delta^{Effort}$ | 1.05 | −0.01 | 0.01 | 0.55 | 1224 | 1.07 | 0.02 | −0.03 | 0.06* | 1093 | [0.31] | [0.08]* |
| | (0.40) | (0.03) | (0.03) | | | (0.37) | (0.03) | (0.03) | | | | |
| | | [0.70] | [0.49] | | | | [1.00] | [1.00] | | | | |
| *Primary behavioral outcomes* | | | | | | | | | | | | |
| Objective measure: water has been treated with chlorine | 0.20 | 0.06 | 0.03 | 0.29 | 1216 | 0.28 | 0.02 | −0.02 | 0.31 | 1052 | [0.37] | [0.38] |
| | (0.40) | (0.03)* | (0.03) | | | (0.45) | (0.04) | (0.03) | | | | |
| *Secondary behavioral outcomes* | | | | | | | | | | | | |
| Amount saved regularly (per week) | 77.88 | 0.71 | 2.74 | 0.87 | 1251 | 82.08 | 27.06 | 6.86 | 0.20 | 1114 | [0.18] | [0.62] |
| | (197.36) | (12.63) | (13.01) | | | (178.11) | (13.06)** | (14.15) | | | | |
| | | [1.00] | [1.00] | | | | [0.13] | [0.55] | | | | |
| Total hours of work in last 3 months | 90.09 | 2.62 | −5.77 | 0.51 | 1249 | 102.94 | −4.78 | −27.61 | 0.07* | 1115 | [0.74] | [0.17] |
| | (151.97) | (11.25) | (11.58) | | | (161.14) | (12.88) | (10.80)** | | | | |
| | | [1.00] | [1.00] | | | | [0.90] | [0.04]** | | | | |
| Index of investment in children's education | −0.05 | −0.01 | 0.05 | 0.43 | 786 | 0.05 | −0.06 | −0.08 | 0.79 | 746 | [0.07]* | [0.83] |
| | (0.76) | (0.06) | (0.08) | | | (0.85) | (0.07) | (0.07) | | | | |
| | | [1.00] | [1.00] | | | | [0.64] | [0.31] | | | | |

*Notes:* * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table C.5: Active treatments vs. placebo: Beliefs, Knowledge and Risk

| | (1) INF Treatment Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) TP = EF $p$-value | (5) $N$ |
|---|---|---|---|---|---|
| *Other possible mechanisms* | | | | | |
| Belief: Proportion of diarrhea incidences avoided through chlorination | 0.75 | 0.01 | 0.02 | 0.64 | 2372 |
| | (0.39) | (0.02) | (0.02) | | |
| Chlorine Knowledge Score | 1.12 | 0.02 | −0.00 | 0.48 | 2372 |
| | (0.69) | (0.03) | (0.04) | | |
| Risk Aversion Measure | 1.74 | −0.02 | −0.04 | 0.66 | 2188 |
| | (0.82) | (0.05) | (0.04) | | |

*Notes:* Column 4 reports the p-value of the t-test of equality between the treatment effects of TP and EF. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table 6: Baseline balance: dispenser vs. non-dispenser villages

| | (1) Village without Chlorine Dispenser Mean (SD) | (2) Village with Chlorine Dispenser Difference | (3) $N$ |
|---|---|---|---|
| *Observables* | | | |
| Age | 26.25 | 0.21 | 3750 |
| | (4.68) | (0.15) | |
| Married/ Cohabiting | 0.89 | −0.01 | 3750 |
| | (0.31) | (0.01) | |
| Education Level | 5.84 | 0.10 | 3750 |
| | (1.18) | (0.04)*** | |
| High Wealth Index | 0.51 | 0.01 | 3750 |
| | (0.50) | (0.02) | |

*Notes:* * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table C.7: Active treatments vs. placebo: Salience Test Outcomes

| | (1) Placebo Mean | (2) Imagining the Future | (3) Get Going Keep Doing | (4) Chlorine Word Interaction: ITF | (5) Chlorine Word Interaction: GGKD | (6) P-value of Coefficient Equality F-test | (7) $N$ |
|---|---|---|---|---|---|---|---|
| Indicator for remembering 'chlorine' word | 0.40 | 0.06 | 0.02 | – | – | 0.02** | 7170 |
| | (0.49) | (0.01)*** | (0.01)** | – | – | | |
| Indicator for remembering 'future' word | 0.42 | 0.00 | 0.01 | 0.05 | 0.02 | 0.57 | 21510 |
| | (0.49) | (0.01) | (0.01) | (0.02)*** | (0.02) | | |

*Notes:* The specifications control for the total number of words the participant remembered in each list and include a 'chlorine word' fixed effect. The coefficients of the interaction terms show the differential probability of remembering a 'future-related' word if that word is related to chlorine. N refers to the number of words.* denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table C.8: Active treatments & placebo vs. pure control: Phone Access & Task Comprehension Questions

| | (1) Pure Control Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) TP = EF $p$-value | (6) TP = EF = INF $p$-value | (7) $N$ |
|---|---|---|---|---|---|---|---|
| *SMS Task Checks* | | | | | | | |
| Participant uses a phone she owns | 0.70 | 0.00 | −0.03 | −0.00 | 0.23 | 0.45 | 2972 |
| | (0.46) | (0.03) | (0.03) | (0.03) | | | |
| | | [0.61] | [0.54] | [0.69] | | | |
| Participant uses a phone belonging to her household | 0.96 | 0.02 | 0.00 | 0.01 | 0.27 | 0.48 | 2972 |
| | (0.21) | (0.01) | (0.01) | (0.01) | | | |
| | | [0.53] | [0.97] | [0.69] | | | |
| Proportion for whom accessing a phone for 30mins is very difficult or impossible | 0.13 | 0.02 | −0.00 | −0.01 | 0.15 | 0.15 | 2970 |
| | (0.33) | (0.02) | (0.02) | (0.02) | | | |
| | | [0.53] | [0.97] | [0.69] | | | |
| Proportion for whom accessing a phone for 1hr is very difficult or impossible | 0.19 | 0.02 | 0.00 | −0.03 | 0.46 | 0.09* | 2970 |
| | (0.39) | (0.02) | (0.02) | (0.02) | | | |
| | | [0.53] | [0.97] | [0.41] | | | |
| Proportion for whom accessing a phone for 4hrs is very difficult or impossible | 0.35 | −0.02 | −0.03 | −0.04 | 0.48 | 0.65 | 2967 |
| | (0.48) | (0.03) | (0.03) | (0.03) | | | |
| | | [0.53] | [0.53] | [0.41] | | | |
| SMS Comprehension questions correct first time | 0.72 | 0.04 | 0.07 | 0.07 | 0.45 | 0.61 | 2955 |
| | (0.45) | (0.03) | (0.03)** | (0.03)*** | | | |
| | | [0.53] | [0.19] | [0.03]** | | | |
| Number of attempts at SMS comprehension questions | 1.22 | −0.21 | −0.27 | −0.38 | 0.70 | 0.50 | 2955 |
| | (2.36) | (0.15) | (0.15)* | (0.13)*** | | | |
| | | [0.53] | [0.27] | [0.03]** | | | |

*Notes:* These questions were asked as validation checks for the SMS effort task. Column 5 reports the p-value of the t-test of equality between the treatment effects of TP and EF. Column 6 reports the p-value of the F-test of equality between all three treatment effects. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table C.9: Active treatments vs. placebo: excluding villages from certain WASH Benefits Arms

| | (1) INF Treatment Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) TP = EF $p$-value | (5) $N$ |
|---|---|---|---|---|---|
| *Primary psychological outcomes* | | | | | |
| Behavioral Activation Score (BADS) | 29.87 | 0.48 | 0.67 | 0.56 | 1770 |
| | (5.45) | (0.30) | (0.32)** | | |
| | | [0.28] | [0.08]* | | |
| $\beta^{Effort}$ | 1.00 | −0.00 | 0.00 | | 1758 |
| | (0.00) | (0.00) | (0.00) | | |
| | | [0.84] | [0.83] | | |
| *Secondary psychological outcomes* | | | | | |
| Tower of London: Total Moves | 21.22 | 0.08 | −0.28 | 0.31 | 1803 |
| | (6.59) | (0.35) | (0.36) | | |
| | | [1.00] | [0.77] | | |
| General Self-Efficacy Score (GSE) | 43.39 | 1.34 | 1.78 | 0.45 | 1770 |
| | (11.02) | (0.60)** | (0.54)*** | | |
| | | [0.15] | [0.01]*** | | |
| $\beta^{MPL}$ | 0.99 | 0.00 | −0.00 | 0.71 | 1743 |
| | (0.32) | (0.02) | (0.02) | | |
| | | [1.00] | [1.00] | | |
| $\delta^{MPL}$ | 0.98 | −0.00 | −0.00 | 0.82 | 1803 |
| | (0.02) | (0.00) | (0.00) | | |
| | | [1.00] | [1.00] | | |
| $\delta^{Effort}$ | 1.00 | −0.00 | −0.00 | | 1760 |
| | (0.00) | (0.00) | (0.00) | | |
| | | [0.44] | [0.37] | | |
| *Primary behavioral outcomes* | | | | | |
| Objective measure: water has been treated with chlorine | 0.23 | 0.02 | 0.01 | 0.64 | 1719 |
| | (0.42) | (0.03) | (0.03) | | |
| *Secondary behavioral outcomes* | | | | | |
| Amount saved regularly (per week) | 92.11 | 11.04 | −3.72 | 0.22 | 1795 |
| | (207.77) | (11.02) | (11.75) | | |
| | | [1.00] | [1.00] | | |
| Total hours of work in last 3 months | 97.12 | −5.07 | −18.93 | 0.19 | 1796 |
| | (161.60) | (9.64) | (8.92)** | | |
| | | [1.00] | [0.12] | | |
| Index of investment in children's education | 0.02 | −0.03 | 0.01 | 0.43 | 1178 |
| | (0.86) | (0.06) | (0.06) | | |
| | | [1.00] | [1.00] | | |

*Notes:* Column 4 reports the p-value of the t-test of equality between the treatment effects of TP and EF. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table C.10: Active treatments & placebo vs. pure control: excluding villages from certain WASH Benefits Arms

| | (1) Pure Control Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) TP = EF $p$-value | (6) TP = EF = INF $p$-value | (7) $N$ |
|---|---|---|---|---|---|---|---|
| *Primary psychological outcomes* | | | | | | | |
| Behavioral Activation Score (BADS) | 29.88 | 0.23 | 0.44 | −0.26 | 0.53 | 0.07* | 2211 |
| | (5.34) | (0.34) | (0.35) | (0.34) | | | |
| | | [0.33] | [0.12] | [0.28] | | | |
| $\beta^{Effort}$ | 1.00 | −0.01 | −0.00 | −0.00 | | | 2189 |
| | (0.00) | (0.00)*** | (0.00)*** | (0.00)*** | | | |
| | | [0.00]*** | [0.00]*** | [0.00]*** | | | |
| *Secondary psychological outcomes* | | | | | | | |
| Tower of London: Total Moves | 23.88 | −0.00 | −0.30 | 0.00 | 0.45 | 0.67 | 2252 |
| | (6.79) | (0.56) | (0.59) | (0.56) | | | |
| | | [1.00] | [0.83] | [1.00] | | | |
| General Self-Efficacy Score (GSE) | 43.07 | 1.53 | 2.03 | 0.20 | 0.39 | 0.00*** | 2217 |
| | (9.67) | (0.90)* | (0.84)** | (0.86) | | | |
| | | [0.32] | [0.09]* | [1.00] | | | |
| $\beta^{MPL}$ | 0.97 | 0.01 | 0.01 | 0.02 | 0.82 | 0.96 | 2187 |
| | (0.36) | (0.03) | (0.03) | (0.03) | | | |
| | | [1.00] | [0.83] | [1.00] | | | |
| $\delta^{MPL}$ | 0.98 | −0.00 | −0.00 | −0.00 | 0.73 | 0.94 | 2252 |
| | (0.02) | (0.00)* | (0.00)** | (0.00)* | | | |
| | | [0.32] | [0.09]* | [0.65] | | | |
| $\delta^{Effort}$ | 1.00 | 0.00 | −0.00 | 0.00 | | | 2192 |
| | (0.00) | (0.00) | (0.00) | (0.00) | | | |
| | | [1.00] | [0.59] | [1.00] | | | |
| *Primary behavioral outcomes* | | | | | | | |
| Objective measure: water has been treated with chlorine | 0.22 | 0.05 | 0.04 | 0.03 | 0.83 | 0.81 | 2157 |
| | (0.41) | (0.03)* | (0.02)* | (0.03) | | | |
| *Secondary behavioral outcomes* | | | | | | | |
| Amount saved regularly (per week) | 89.57 | 8.54 | −5.25 | −1.26 | 0.25 | 0.48 | 2244 |
| | (224.01) | (13.49) | (13.64) | (12.80) | | | |
| | | [1.00] | [0.31] | [1.00] | | | |
| Total hours of work in last 3 months | 105.19 | −10.78 | −24.01 | −4.94 | 0.22 | 0.10* | 2244 |
| | (177.72) | (11.72) | (11.06)** | (9.89) | | | |
| | | [1.00] | [0.10] | [1.00] | | | |
| Index of investment in children's education | −0.04 | 0.05 | 0.09 | 0.07 | 0.45 | 0.75 | 1482 |
| | (0.64) | (0.06) | (0.05)* | (0.06) | | | |
| | | [1.00] | [0.11] | [1.00] | | | |

*Notes:* Column 5 reports the p-value of the t-test of equality between the treatment effects of TP and EF. Column 6 reports the p-value of the F-test of equality between all three treatment effects. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table C.11: Active treatments vs. placebo: exploratory outcomes, excluding villages from certain WASH Benefits Arms

| | (1) INF Treatment Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) TP = EF $p$-value | (5) $N$ |
|---|---|---|---|---|---|
| *Exploratory Variables Psychology* | | | | | |
| CESD Total | 14.17 | −0.20 | −0.75 | 0.04** | 1778 |
| | (4.12) | (0.26) | (0.26)*** | | |
| | | [0.17] | [0.01]** | | |
| Sophisticated Time Inconsistency Self Report (Tempted - Ideal) | 0.30 | −0.34 | −0.16 | 0.30 | 1789 |
| | (2.53) | (0.16)** | (0.16) | | |
| | | [0.04]** | [0.24] | | |
| Sophisticated Time Inconsistency Self Report (Expected - Ideal) | 0.40 | −0.56 | −0.24 | 0.03** | 1789 |
| | (2.52) | (0.15)*** | (0.16) | | |
| | | [0.00]*** | [0.15] | | |
| *Saving* | | | | | |
| Indicator: Amount saved regularly is positive | 0.39 | 0.09 | −0.03 | 0.00*** | 1815 |
| | (0.49) | (0.03)*** | (0.03) | | |
| | | [0.00]*** | [1.00] | | |
| Number of new ROSCAs joined in last 3 months | 0.17 | 0.03 | −0.00 | 0.22 | 1803 |
| | (0.43) | (0.03) | (0.03) | | |
| | | [0.11] | [1.00] | | |
| Indicator: Respondent saves for productive investments | 0.19 | 0.07 | −0.02 | 0.00*** | 1815 |
| | (0.39) | (0.03)*** | (0.02) | | |
| | | [0.00]*** | [1.00] | | |
| *Labor* | | | | | |
| Total days of work in last 3 months | 19.30 | 0.93 | −2.78 | 0.06* | 1798 |
| | (27.96) | (1.86) | (1.65)* | | |
| | | [1.00] | [0.23] | | |
| Average monthly earnings in last 3 months | 977.17 | −39.74 | −138.90 | 0.46 | 1800 |
| | (2528.17) | (128.49) | (143.78) | | |
| | | [1.00] | [0.23] | | |
| *Health* | | | | | |
| Number of diarrhea incidences per child u15 in last 3 months | 0.22 | −0.06 | −0.05 | 0.73 | 1714 |
| | (0.50) | (0.03)** | (0.03)* | | |
| | | [0.16] | [0.27] | | |
| Proportion of children u15 vaccinated in last 3 months | 0.23 | 0.02 | −0.02 | 0.04** | 1706 |
| | (0.36) | (0.02) | (0.02) | | |
| | | [0.22] | [0.63] | | |
| Number of ANC visits made in last 3 months (among pregnant women) | 1.18 | −0.29 | −0.24 | 0.88 | 176 |
| | (1.20) | (0.31) | (0.38) | | |
| | | [0.22] | [0.67] | | |
| Number of children u15 taken for healthcare check-up in last 3 months | 0.21 | −0.03 | −0.02 | 0.46 | 1710 |
| | (0.34) | (0.02)* | (0.02) | | |
| | | [0.16] | [0.63] | | |
| *Investment* | | | | | |
| Total asset expenditure in last 3 months | 3542.91 | −163.08 | −635.29 | 0.27 | 1798 |
| | (9354.04) | (492.46) | (505.80) | | |
| | | [1.00] | [1.00] | | |
| Total expenditure on livestock | 1439.28 | 39.00 | −183.79 | 0.37 | 1798 |
| | (4727.54) | (244.91) | (218.10) | | |
| | | [1.00] | [1.00] | | |
| Total expenditure on household durables | 1043.58 | 237.24 | 55.84 | 0.32 | 1795 |
| | (2521.38) | (208.04) | (162.86) | | |
| | | [1.00] | [1.00] | | |
| *Agriculture* | | | | | |
| Total expenditure on fertilizer, seeds, pesticide and plots | 1783.92 | −27.72 | −85.38 | 0.66 | 1797 |
| | (2275.12) | (123.54) | (132.81) | | |
| | | [1.00] | [1.00] | | |
| Indicator: respondent has purchased or leased a plot in last 3 months | 0.28 | 0.04 | 0.00 | 0.17 | 1815 |
| | (0.45) | (0.03) | (0.03) | | |
| | | [1.00] | [1.00] | | |
| Total expenditure on fertilizer in last 3 months | 1072.75 | −8.06 | −12.72 | 0.96 | 1795 |
| | (1597.92) | (81.35) | (90.82) | | |
| | | [1.00] | [1.00] | | |
| Total expenditure on seeds in last 3 months | 630.52 | 1.80 | 1.06 | 0.99 | 1798 |
| | (849.84) | (53.59) | (54.50) | | |
| | | [1.00] | [1.00] | | |
| Total expenditure on pesticide in last 3 months | 10.21 | −1.46 | −3.00 | 0.52 | 1795 |
| | (42.36) | (2.68) | (2.93) | | |
| | | [1.00] | [1.00] | | |
| Total expenditure on leasing plots in last 3 months | 1085.33 | 40.46 | 3.65 | 0.77 | 1797 |
| | (2488.18) | (119.66) | (123.83) | | |
| | | [1.00] | [1.00] | | |
| *Business* | | | | | |
| Average daily hours spent on all businesses | 1.47 | 0.39 | 0.11 | 0.18 | 1799 |
| | (3.06) | (0.21)* | (0.17) | | |
| | | [0.07]* | [1.00] | | |
| Total expenditure on all businesses in last 30 days | 1058.87 | 382.70 | 90.55 | 0.16 | 1796 |
| | (3272.79) | (182.71)** | (207.38) | | |
| | | [0.07]* | [1.00] | | |
| *Family Planning* | | | | | |
| Index of family planning measures | −0.03 | 0.12 | −0.04 | 0.00*** | 1779 |
| | (0.92) | (0.06)** | (0.06) | | |

*Notes:* Column 4 reports the p-value of the t-test of equality between the treatment effects of TP and EF. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table C.12: Active treatments & placebo vs. pure control: exploratory outcomes, excluding villages from certain WASH Benefits Arms

| | (1) Pure Control Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) TP = EF *p*-value | (6) TP = EF = INF *p*-value | (7) *N* |
|---|---|---|---|---|---|---|---|
| *Exploratory Variables Psychology* | | | | | | | |
| CESD Total | 14.73 | −0.61 | −1.12 | −0.37 | 0.04** | 0.01** | 2225 |
| | (4.10) | (0.27)** | (0.27)*** | (0.26) | | | |
| | | [0.05]* | [0.00]*** | [0.43] | | | |
| Sophisticated Time Inconsistency Self Report (Tempted - Ideal) | 0.02 | −0.15 | 0.07 | 0.23 | 0.21 | 0.07* | 2234 |
| | (2.76) | (0.18) | (0.18) | (0.18) | | | |
| | | [0.15] | [0.86] | [0.43] | | | |
| Sophisticated Time Inconsistency Self Report (Expected - Ideal) | 0.27 | −0.37 | −0.08 | 0.17 | 0.05* | 0.00*** | 2234 |
| | (2.85) | (0.17)** | (0.18) | (0.17) | | | |
| | | [0.05]* | [0.86] | [0.43] | | | |
| *Saving* | | | | | | | |
| Indicator: Amount saved regularly is positive | 0.32 | 0.15 | 0.02 | 0.05 | 0.00*** | 0.00*** | 2266 |
| | (0.47) | (0.03)*** | (0.03) | (0.03)* | | | |
| | | [0.00]*** | [1.00] | [0.21] | | | |
| Number of new ROSCAs joined in last 3 months | 0.19 | 0.01 | −0.02 | −0.02 | 0.20 | 0.39 | 2254 |
| | (0.44) | (0.03) | (0.03) | (0.03) | | | |
| | | [0.28] | [1.00] | [1.00] | | | |
| Indicator: Respondent saves for productive investments | 0.19 | 0.07 | −0.02 | −0.00 | 0.00*** | 0.00*** | 2266 |
| | (0.39) | (0.03)** | (0.03) | (0.02) | | | |
| | | [0.01]** | [1.00] | [1.00] | | | |
| *Labor* | | | | | | | |
| Total days of work in last 3 months | 20.82 | 0.14 | −3.27 | −0.81 | 0.08* | 0.15 | 2245 |
| | (29.20) | (2.04) | (1.86)* | (1.77) | | | |
| | | [1.00] | [0.19] | [1.00] | | | |
| Average monthly earnings in last 3 months | 961.97 | −46.77 | −136.50 | −2.49 | 0.49 | 0.62 | 2244 |
| | (2476.67) | (149.78) | (148.03) | (157.01) | | | |
| | | [1.00] | [0.22] | [1.00] | | | |
| *Health* | | | | | | | |
| Number of diarrhea incidences per child u15 in last 3 months | 0.20 | −0.05 | −0.04 | 0.00 | 0.71 | 0.13 | 2138 |
| | (0.51) | (0.03)* | (0.03) | (0.03) | | | |
| | | [0.58] | [0.46] | [1.00] | | | |
| Proportion of children u15 vaccinated in last 3 months | 0.24 | 0.01 | −0.03 | −0.01 | 0.04** | 0.11 | 2128 |
| | (0.36) | (0.02) | (0.02) | (0.02) | | | |
| | | [0.90] | [0.46] | [1.00] | | | |
| Number of ANC visits made in last 3 months (among pregnant women) | 1.22 | −0.45 | −0.35 | 0.07 | 0.74 | 0.25 | 208 |
| | (1.21) | (0.38) | (0.42) | (0.44) | | | |
| | | [0.58] | [0.46] | [1.00] | | | |
| Number of children u15 taken for healthcare check-up in last 3 months | 0.18 | −0.01 | 0.00 | 0.02 | 0.48 | 0.24 | 2134 |
| | (0.32) | (0.02) | (0.02) | (0.02) | | | |
| | | [0.90] | [0.80] | [1.00] | | | |
| *Investment* | | | | | | | |
| Total asset expenditure in last 3 months | 2464.11 | 826.25 | 429.86 | 1013.39 | 0.35 | 0.44 | 2244 |
| | (5138.49) | (421.52)* | (389.16) | (466.01)** | | | |
| | | [0.18] | [0.37] | [0.10]* | | | |
| Total expenditure on livestock | 1164.22 | 110.75 | −84.04 | 99.99 | 0.43 | 0.62 | 2246 |
| | (4010.40) | (264.26) | (250.39) | (244.08) | | | |
| | | [0.82] | [0.68] | [0.29] | | | |
| Total expenditure on household durables | 1337.03 | −128.54 | −314.84 | −364.18 | 0.30 | 0.50 | 2244 |
| | (3169.93) | (220.31) | (180.37)* | (207.27)* | | | |
| | | [0.82] | [0.32] | [0.10]* | | | |
| *Agriculture* | | | | | | | |
| Total expenditure on fertilizer, seeds, pesticide and plots | 1478.86 | 328.56 | 278.37 | 345.19 | 0.70 | 0.87 | 2245 |
| | (1987.55) | (126.19)*** | (133.55)** | (125.41)*** | | | |
| | | [0.03]** | [0.10] | [0.03]** | | | |
| Indicator: respondent has purchased or leased a plot in last 3 months | 0.28 | 0.04 | 0.01 | 0.00 | 0.14 | 0.18 | 2266 |
| | (0.45) | (0.03) | (0.03) | (0.03) | | | |
| | | [0.13] | [0.73] | [0.48] | | | |
| Total expenditure on fertilizer in last 3 months | 942.94 | 143.18 | 134.05 | 146.55 | 0.92 | 0.99 | 2244 |
| | (1486.41) | (89.12) | (96.18) | (90.91) | | | |
| | | [0.13] | [0.28] | [0.14] | | | |
| Total expenditure on seeds in last 3 months | 512.68 | 145.22 | 152.01 | 138.62 | 0.90 | 0.97 | 2246 |
| | (795.70) | (52.09)*** | (53.82)*** | (53.49)*** | | | |
| | | [0.03]** | [0.03]** | [0.03]** | | | |
| Total expenditure on pesticide in last 3 months | 5.92 | 2.82 | 1.41 | 4.25 | 0.55 | 0.61 | 2244 |
| | (31.97) | (2.16) | (2.30) | (2.77) | | | |
| | | [0.15] | [0.49] | [0.14] | | | |
| Total expenditure on leasing plots in last 3 months | 941.13 | 178.34 | 122.34 | 115.78 | 0.65 | 0.85 | 2245 |
| | (2210.38) | (137.17) | (138.18) | (137.79) | | | |
| | | [0.15] | [0.49] | [0.23] | | | |
| *Business* | | | | | | | |
| Average daily hours spent on all businesses | 1.81 | 0.14 | −0.17 | −0.26 | 0.13 | 0.16 | 2244 |
| | (3.37) | (0.23) | (0.20) | (0.21) | | | |
| | | [1.00] | [0.69] | [0.27] | | | |
| Total expenditure on all businesses in last 30 days | 1400.49 | 28.07 | −279.24 | −342.91 | 0.13 | 0.10* | 2244 |
| | (3822.08) | (221.71) | (246.88) | (218.78) | | | |
| | | [1.00] | [0.69] | [0.27] | | | |
| *Family Planning* | | | | | | | |
| Index of family planning measures | 0.04 | 0.08 | −0.08 | −0.05 | 0.01*** | 0.01** | 2214 |
| | (0.90) | (0.06) | (0.06) | (0.06) | | | |

*Notes:* Column 5 reports the p-value of the t-test of equality between the treatment effects of TP and EF. Column 6 reports the p-value of the F-test of equality between all three treatment effects. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Table C.13: Active treatments & placebo vs. pure control: exploratory outcomes, excluding villages from certain WASH Benefits Arms

| | (1) Pure Control Mean (SD) | (2) TP Treatment Effect | (3) EF Treatment Effect | (4) INF Treatment Effect | (5) TP = EF *p*-value | (6) TP = EF = INF *p*-value | (7) *N* |
|---|---|---|---|---|---|---|---|
| *SMS Task Checks* | | | | | | | |
| Participant uses a phone she owns | 0.70 | 0.00 | −0.03 | −0.00 | 0.23 | 0.45 | 2972 |
| | (0.46) | (0.03) | (0.03) | (0.03) | | | |
| | | [0.61] | [0.54] | [0.69] | | | |
| Participant uses a phone belonging to her household | 0.96 | 0.02 | 0.00 | 0.01 | 0.27 | 0.48 | 2972 |
| | (0.21) | (0.01) | (0.01) | (0.01) | | | |
| | | [0.53] | [0.97] | [0.69] | | | |
| Proportion for whom accessing a phone for 30mins is very difficult or impossible | 0.13 | 0.02 | −0.00 | −0.01 | 0.15 | 0.15 | 2970 |
| | (0.33) | (0.02) | (0.02) | (0.02) | | | |
| | | [0.53] | [0.97] | [0.69] | | | |
| Proportion for whom accessing a phone for 1hr is very difficult or impossible | 0.19 | 0.02 | 0.00 | −0.03 | 0.46 | 0.09* | 2970 |
| | (0.39) | (0.02) | (0.02) | (0.02) | | | |
| | | [0.53] | [0.97] | [0.41] | | | |
| Proportion for whom accessing a phone for 4hrs is very difficult or impossible | 0.35 | −0.02 | −0.03 | −0.04 | 0.48 | 0.65 | 2967 |
| | (0.48) | (0.03) | (0.03) | (0.03) | | | |
| | | [0.53] | [0.53] | [0.41] | | | |
| SMS Comprehension questions correct first time | 0.72 | 0.04 | 0.07 | 0.07 | 0.45 | 0.61 | 2955 |
| | (0.45) | (0.03) | (0.03)** | (0.03)*** | | | |
| | | [0.53] | [0.19] | [0.03]** | | | |
| Number of attempts at SMS comprehension questions | 1.22 | −0.21 | −0.27 | −0.38 | 0.70 | 0.50 | 2955 |
| | (2.36) | (0.15) | (0.15)* | (0.13)*** | | | |
| | | [0.53] | [0.27] | [0.03]** | | | |

*Notes:* Column 5 reports the p-value of the t-test of equality between the treatment effects of TP and EF. Column 6 reports the p-value of the F-test of equality between all three treatment effects. * denotes significance at 10 pct., ** at 5 pct., and *** at 1 pct. level.

Figure C.1: Tower of London Example Screen

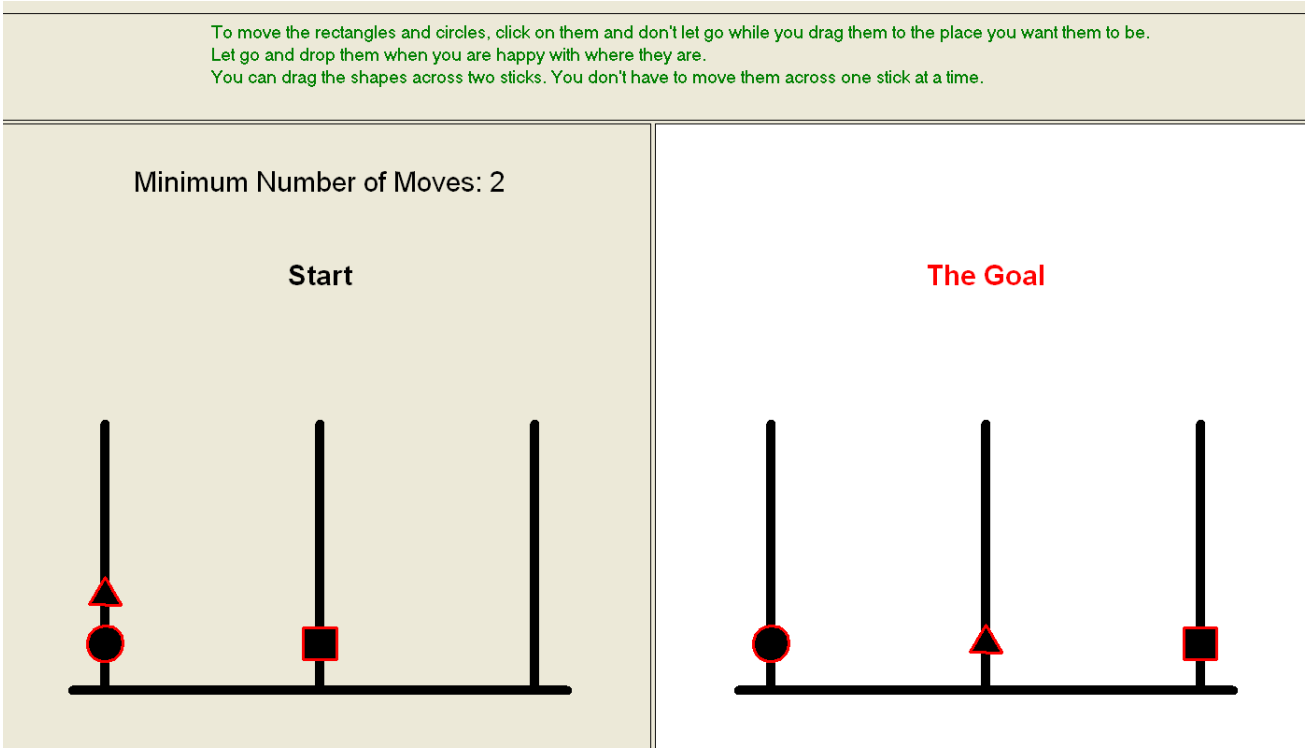

Figure C.2: MPL Task Example Screen

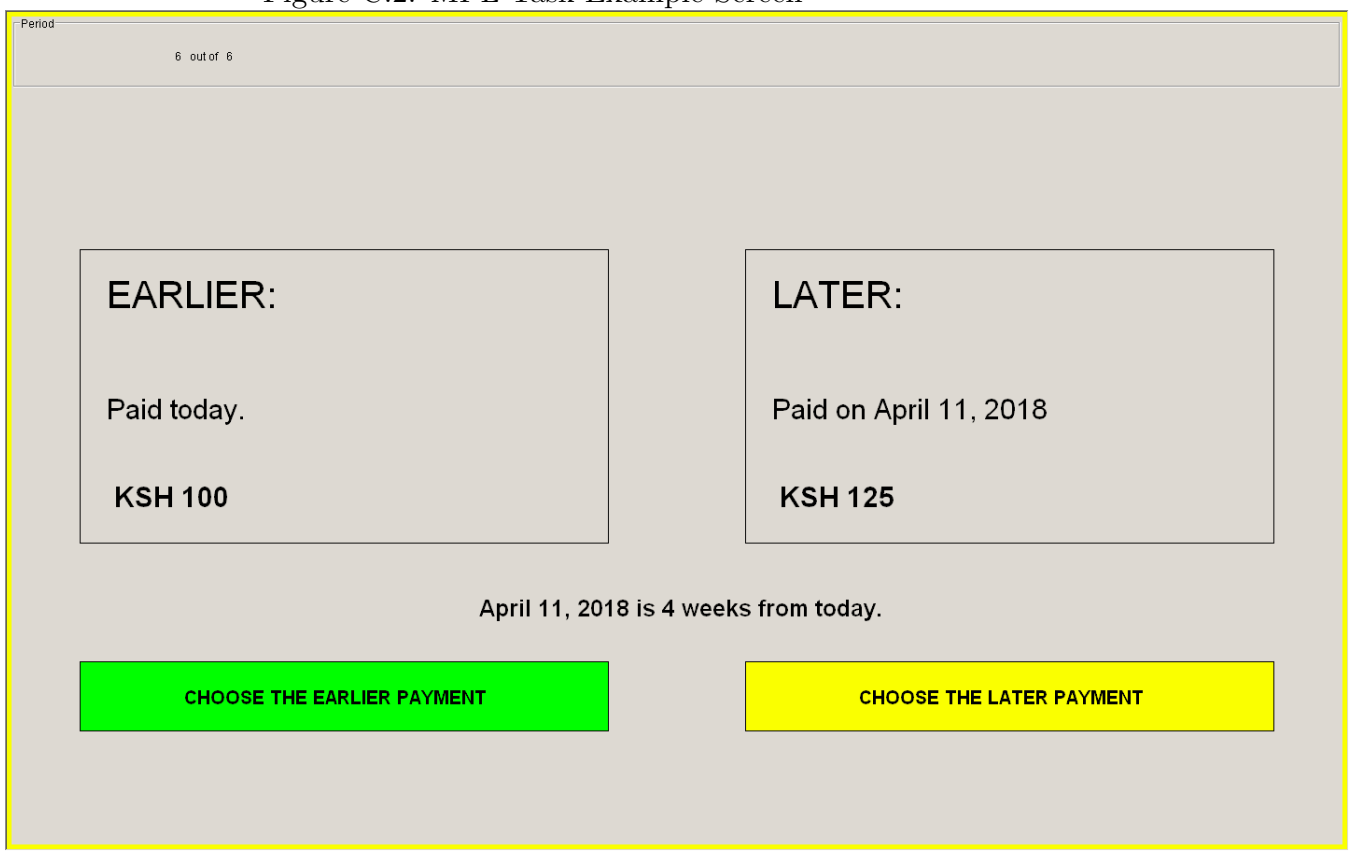

Figure C.3: Effort Discounting Task Example Screen