

Alleviating time poverty among the working poor

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Note:

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A copy of the accepted project proposal can be located here:

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Abstract

Poverty entails more than a scarcity of material resources—it also involves a shortage of time. To examine the causal benefits of reducing time poverty, we are conducting a longitudinal field experiment in an urban slum in Kenya with a sample of working mothers, a population who is especially likely to experience severe time poverty. Participants receive vouchers for services designed to reduce their burden of unpaid labor. We are comparing the effect of these vouchers against equivalently valued unconditional cash transfers (UCTs) and a neutral control condition. Using a pre-post design, we are measuring whether time-saving vouchers increase subjective well-being, lower perceived stress, and reduce relationship conflict as compared to UCTs and a control condition. The interim results reported here suggest that neither time-saving vouchers or UCT's significantly impact subjective well-being, self-reported stress, or relationship satisfaction among participants in this sample. The implications of these interim results are discussed.

Keywords: Time-saving services; subjective well-being; time-use; cash transfers

Poverty is associated with lower engagement in preventative health care (even when access is available),^{i,ii} lower medication adherence,ⁱⁱⁱ increased spending on ‘temptation goods’,^{iv} reduced productivity at work,^v and lower adoption of useful new technologies (e.g., agricultural innovations).^{vi} These seemingly disparate behaviors may share a common feature: they may be driven, in part, by the fact that people living in material poverty also tend to be ‘time poor.’ Indeed, poverty is not only a state of material constraints, it also involves temporal constraints. The current study explores whether time poverty reinforces barriers toward economic mobility and contributes to poverty traps.

Consistent with previous research,^{vii,viii,ix} we refer to individuals as ‘time poor’ when they engage in long hours of unpaid work and have no choice but to do so. Time poverty severely affects low-income women living in developing countries. A lack of basic household amenities requires poor women to spend far more time on household production tasks like cooking and cleaning as compared to their richer counterparts.^x For example, women in Sub-Saharan Africa spend an average of 4.2 hours on unpaid work each day.^{xi} These unpaid household activities can be conceptualized as a kind of tax that individuals, especially women, must pay before undertaking remunerated work. In this project, we propose that reducing time poverty, thereby lowering this personal ‘tax,’ will have direct benefits for subjective well-being, perceived stress, and relationship conflict, as well as indirect benefits for economic well-being.

Despite these potentially far-reaching consequences, there is little understanding of the psychological and economic consequences of the time poverty that often coincides with financial constraints. Traditional economic measurements of poverty often neglect the fact that households below the poverty line face substantive time deficits (Hirway provides a comprehensive review^{xii}). Furthermore, aid programs tend to focus on material constraints. Billions of dollars of

economic aid have been spent to provide monetary and non-monetary aid to people living in extreme poverty. The most common aid programs include food, livestock, and fertilizer, as well as services such as agricultural training, community health workers, and teachers.^{xiii,xiv,xv,xvi} We suggest that the effectiveness of these aid programs could be increased by considering recipients' time costs, either by adjusting how aid is delivered or by creating programs directly aimed at reducing recipients' temporal constraints (Khera provides related arguments^{xvii,xviii}).

One reason that aid programs may neglect time poverty is the lack of data on time-use amongst the working poor in developing countries. While richer countries have benefited from extensive survey data on time-use, these data are critically absent from countries where time poverty is the most pervasive (Hirway provides a critical review^{xii}). Despite these limitations, there is some evidence that time poverty is an important factor in economic development efforts. A large scale correlational analysis of the Indian Human Development survey, which included 41,554 households in 1,503 villages and 971 urban neighborhoods, found that women who owned a cookstove and did not have to fetch wood were healthier and spent more time on income generating activities than women who did not own a cookstove.^{xix} Of course, this research cannot rule out selection effects, therefore women with higher wealth or status in their communities might also be more likely to own and benefit from appliances such as cookstoves.

One previous study experimentally tested the causal effects of reducing unpaid labor.^{xx} In this experiment, sixty working adults recruited in Vancouver, Canada were assigned to spend a small windfall of money (\$40 CAD) during two consecutive weekends. During one weekend, participants were instructed to spend this windfall in any way that would save them time. During another weekend, participants were instructed to spend this windfall on a material purchase for themselves. After making a time-saving (vs. material) purchase, participants reported greater

positive mood, lower negative mood, and lower perceived stress. However, this experiment targeted affluent individuals living in North America, providing a small one-time payment, and assessing immediate mood. It is therefore unclear whether these findings would apply to poverty alleviation efforts.

Given the limited causal evidence in this area, we are utilizing a randomized control trial to evaluate the benefits of reducing time poverty. We are recruiting working women living in Kibera, an urban slum near Nairobi, Kenya. We selected this population because women living in this context face significant material and temporal constraints. In Kibera, working women earn an average of 100-200 KSH (\$1-2 USD) per day and spend a median of 42 hours on paid labor and 36 hours on unpaid labor each week.^{xxi} We are randomly assigning women living in this community to receive time-saving vouchers designed to reduce their burden of unpaid labor for three consecutive weeks. Specifically, these vouchers are redeemable for cooking or cleaning services (methodological details below). Based on our pilot data, both time-saving vouchers will provide study participants with an additional 3-7 hours each week.

The effect of these time-saving vouchers will be compared against equivalently-valued unconditional cash transfers (UCTs). We are also comparing time-saving vouchers and UCTs against a control condition in which participants do not receive aid of any kind.

UCTs have received a great deal of attention as a critical tool for poverty alleviation in developing countries^{xxii,xxiii} Recent research finds that UCT's produce significant welfare benefits.^{xxi} For example, in a large scale field experiment in Kenya ($N=1,372$), households that received UCTs experienced significant improvements in self-reported happiness, life satisfaction, and perceived stress.^{xxiv} These well-being benefits persisted for up to three years.^{xxv} Cash transfers have also been shown to increase hours of employment, monthly net earnings, and

subjective financial well-being when provided to the unemployed,^{xxvi,xxvii} and to improve monthly cash earnings when provided to micro-entrepreneurs.^{xxviii} Cash transfers also improve empowerment among adolescent girls and young women, proxied by increased agency and control over decision-making, greater access to financial resources, improved schooling outcomes, decreased teen pregnancy, and better health.^{xxix} Furthermore, the administrative and overhead costs of providing unconditional cash transfers are extremely low. Given the well-documented benefits and low administrative costs, UCTs serve as a stringent standard by which to compare the effectiveness of aid programs designed to save time. Using equivalently-valued UCTs as a benchmark, we will measure the cost-effectiveness of time-saving services and isolate the possible distinct benefits of reducing time versus financial poverty.^{xxx,xxxi}

Reducing time poverty directly addresses a critical market failure in urban slums. Time poverty is pervasive in this context due to limited infrastructure and a high cost for basic services (e.g. water, sewage, and electricity^{xxxii}). People in urban slums also cannot afford to purchase time-saving services. In Kibera, there are several small businesses that offer such services, but they are largely unaffordable. For example, a single load (8kg) of laundry costs 500 KSH, on average, which equates to over three times the average daily wage. In our pilot data, 76.5% of working women living in Kibera reported “never” paying for laundry services, and 82.4% reported “never” paying for prepared meals from local vendors. Providing cash transfers is unlikely to address this market failure because people do not readily spend money on time-saving services, even when they can afford to do so.^{xx}

Policymakers are not systematically addressing this market failure, partially because they also undervalue the possible benefits of time-saving services. In an initial pilot study, we asked thirty current and aspiring policymakers from the Harvard Kennedy School of Public Policy how

they would allocate 2100 KSH (\$21 USD) of aid per recipient to improve the welfare of working women living in Kibera. Only 6% of respondents spontaneously reported that the 2100 KSH should be used to save time for these women. When we explicitly provided respondents with the choice to fund one of three aid programs (an unconditional cash transfer program, an in-kind goods program, or a time-saving program), only four respondents (13%) selected the time-saving program and twenty-six respondents (87%) chose cash. These findings suggest that both recipients and policymakers undervalue time-saving services.

In contrast, we expect that reducing temporal (vs. financial) poverty will have a positive impact on three critical outcomes: subjective well-being, perceived stress, and relationship conflict. We focused on subjective well-being and perceived stress because these outcomes are linked to economic decision-making.^{xxxiii} For example, greater positive affect is associated with a range of downstream economic benefits including increased productivity, work performance, and higher earnings.^{xxxiv,xxxv} Furthermore, stress caused by poverty is linked to short-sighted economic decision-making and excessive risk aversion.^{xxxvi} We focused on relationship conflict based on existing evidence that cash transfers can reduce intimate partner violence.^{xxxvii} However, there is also some data showing that providing cash windfalls to women may lead to arguments with their partner about how to spend this income, possibly increasing domestic violence.^{xxi} Because gains of time are harder to account for than gains of money^{xxxviii} and because time is less fungible than money,^{xxxix} we predict that providing women with time-saving vouchers will be less likely to cause relationship conflict than cash transfers.

As discussed above, recent research finds that receiving cash transfers can have positive benefits for subjective well-being,^{xxi, .xl} stress^{xxi,xli,xlii} and intimate partner violence.^{xliii,xliv} Prior research also finds that time-saving services can have positive benefits for subjective well-being,

perceived stress, and relationship conflict.^{xx} Building on this research, we have pre-registered three hypotheses. We predict that participants who are randomly assigned to receive UCTs or time-saving vouchers will experience positive benefits on each of our three key outcomes of interest at endline compared to participants who are randomly assigned to the control condition. We also predict that participants assigned to receive time-saving vouchers will experience greater positive benefits on these outcomes compared to participants receiving UCTs.¹

H₁: Women who are randomly assigned to receive UCTs for three consecutive weeks will report higher subjective well-being, lower perceived stress, and lower relationship conflict at endline compared to women who are assigned to the control condition and receive no aid of any kind.

H₂: Women who are randomly assigned to receive time-saving services for three consecutive weeks will report higher subjective well-being, lower perceived stress, and lower relationship conflict at endline compared to women who are assigned to the control condition and receive no aid of any kind.

H₃: Women who are randomly assigned to receive time-saving services for three consecutive weeks will report higher subjective well-being, lower perceived stress, and lower relationship conflict at endline compared to women who are assigned to receive equivalently valued UCTs.

¹ This study was accepted as a Pre-Registered Report at *Nature Human Behavior*. For the full experimental study, we will collect data until we have reached a Bayes Factor > 10 or < 0.10 for our pre-registered outcomes (i.e., well-being, stress, and relationship conflict), or until we have reached a total sample size of $N=2,000$ participants across our three experimental conditions. Thus, the results reported here are interim analyses and should be interpreted with caution.

Methods

This research was approved by the ethics committee at the Harvard Business School (HBS-IRB18-0905) and the Kenya Medical Research Institute (Protocol No. Non-Kemri 629).

We are recruiting participants through the Busara Center for Behavioral Economics, a research organization based in Nairobi, Kenya. Busara has a dedicated participant pool of over 15,000 people living in nearby informal settlements, enabling efficient recruitment of working mothers living below the poverty line. The study is implemented from the Kibera Town Center (KTC), a facility located in Kibera and operated by the Human Needs Project. Kibera is the largest informal settlement nearby Nairobi, Kenya, with an estimated 200,000 inhabitants. Based on similar research conducted with Busara,^{xxi} we expected low attrition of around 10%.

Women who live no further than a 30-minute walk from Kibera Town Centre are recruited via text message to participate in a five-minute eligibility phone call. This requirement ensures that accessing KTC does not impose a significant time cost. To participate, respondents must be 18 years of age or older (the legal age of consent in Kenya), provide informed consent, and work for pay at least twenty-five hours per week. To reduce attrition, we are only recruiting working mothers with at least one child who is enrolled in school and living at home. This criterion increases the likelihood that participants will remain in their current residence and complete the study in its entirety.

Based on pilot research, we chose two time-saving vouchers for use in our experiment (prepared meal and laundry services). To ensure that these time-saving vouchers reduce participants' existing burdens of unpaid labor, we are excluding women who report that they "always" use laundry and/or prepared meal services. Similarly, we are excluding women who report spending fewer than three hours per week on cooking and fewer than three hours per week

completing laundry. To ensure that the time-saving services meaningfully reduce the burden of unpaid labor, we are excluding women with seven or more individuals living in their household. To facilitate data collection, respondents must have a working cell phone that is not shared with another household member.

Study Timeline

This study includes a baseline and an endline survey that contain identical pre-registered measures. See Figure 1 for study design.²

Following from related research^{xxi} we are collecting granular data on participants' affective experiences, stress, time-use, and household consumption. All participants receive compensation for completion of the baseline and endline surveys (500 KSH each).

The baseline survey is being conducted in a lab setting (Week 1). Eligible participants are invited to the Kibera Town Centre to provide consent and complete the baseline survey, including the primary pre-registered measures: subjective well-being, stress and relationship conflict. Participants are also completing exploratory and demographic measures (See Supplementary Information for a complete list of measures).

After completing the baseline survey, participants are randomly assigned between-subjects to one of two treatment conditions or a control condition (1=time-saving, 2=UCT, 3=control). Using the “sample” function in R, we are generating a random integer between the values of 1 and 3 by running the following code for each participant: `treat<-sample(1:3,1)`.

Starting in Week 3, participants who are randomly assigned to one of the two treatment conditions are receiving 1) time-saving services or 2) equivalently-valued unconditional cash transfers. Participants receive one of these windfalls every week for three consecutive weeks

² We are also conducting weekly phone calls and collecting daily text message data. These data have not been cleaned or analyzed for the purposes of this report and are not discussed further.

(Week 3-5). The time-saving and UCT conditions are being matched in terms of cost-to-administer, thereby holding constant the total amount of aid that is disbursed. In Week 6, all participants are invited back to KTC to complete the endline survey, which includes the identical measures of subjective well-being, stress, and relationship conflict. See Figure 1 for timeline.

For all data collections, trained field officers guide participants through our measures in Swahili, ensuring that every participant—including those with limited reading, writing, and numeracy skills—comprehend and correctly complete instructions and measures. Field officers are blind to condition and study hypotheses for the baseline and endline data collection.

Details on Time-Saving Vouchers. To develop the time-saving vouchers, we selected services that were likely to have the greatest benefits for our target population. We conducted a pilot study to identify local services that meet the following criteria for working women in Kibera: the services 1) saved a significant amount of time, 2) replaced chores that are unpleasant, and 3) replaced chores that did not involve significant social interaction (i.e., women typically engaged in these chores alone). Based on these criteria, we selected prepared meals and laundry services (see Supplemental Information, Supplemental Results section for the results of our pilot). For all three treatment weeks, participants who are assigned to the time-saving condition receive either prepared meals (two meal varieties alternated across weeks) or laundry services.

Condition 1: Time-Saving Vouchers. The cost to provide each of these time-saving services is 500 KSH per week. Based on our pilot data, 500 KSH worth of these services eliminates a significant amount of unpaid labor among our target population (3-7 hours per week on average; Supplemental Information). Building on prior research, we sought to amplify the benefits of the time-saving vouchers by reminding participants about the specific amount of time they will save^{xlv} and by asking them to make detailed plans for this additional time.^{xlvi,xlvii}

Condition 2: Unconditional Cash Transfers. The weekly cash transfer is 500 KSH.^{xxi}

Condition 3: Control. Participants receive no windfalls of any kind. This condition provides a benchmark for evaluating the effectiveness of the treatments on our key outcomes.

Manipulation Check (T2)

To ensure that the time-saving services reduced the burden of unpaid labor as compared to UCTs, we asked participants who were assigned to our experimental conditions to complete the following question at endline: “Over the PAST 7 DAYS, to what extent did receiving [prepared meals / laundry / cash transfers] affect your burden of unpaid labor?” Participants indicate their response on a scale from -3 = *Decreased my burden of unpaid labor a lot*, 0 = *Did not change my burden of unpaid labor*; 3 = *Increased my burden of unpaid labor a lot*.

Primary Measures (T1 and T2)

To measure subjective well-being at baseline and endline, participants complete (a) the 12-item Schedule of Positive Affect and Negative Affect (SPANEX^{xlvi}), and (b) the 5-item Satisfaction with Life Scale (SWLS^{xlix}). Based on past research, we define subjective well-being (SWB) as a combination of high positive affect (PA), low negative affect (NA) and high satisfaction with life (SWL).^{l,li,lii} We created a composite measure at both time points by combining PA (averaged), SWL (averaged) and NA (averaged and reverse-coded).

To measure perceived stress, participants complete the 10-item Perceived Stress Scale (PSS^{liii,liiv}) at baseline and endline. The PSS conceptualizes perceived stress as a lack of control over important life outcomes. Previous research suggests that both time-saving services and UCTs increase perceived control over daily events (Whillans, Pow, & Norton, *Working Paper*: https://www.hbs.edu/faculty/Publication%20Files/18-072_cb00f26d-7ca8-4d06-ae27-a501d1d9588d.pdf).^{xx} Our focus on this definition of stress addresses recent calls from

researchers to focus on specific elements of stress, since stress as an overall concept has become too broad to be useful.^{lv} We created a composite measure of perceived stress at both time points by taking the average of all items of the PSS.

To measure relationship conflict at baseline and endline, participants complete the 9-item negative interaction scale of the network of relationship inventory.^{lvi} We have created a composite of relationship conflict at both time points by taking the average of all nine items. For participants who report that they are not married or in a marriage-like relationship, they complete these measures by responding about their closest social relationship (e.g., sister, mother).

Proposed Analysis Pipeline

Analytic Plan for Pre-registered Hypotheses

Overview. We test each of our pre-registered hypotheses using ANCOVA analyses. We conduct separate ANCOVA analyses to test for differences in well-being, perceived stress, and relationship conflict at endline, controlling for the respective baseline measure in each analysis.

Exploratory analyses

Patterns of time-use are also measured during the baseline and endline surveys. Through a structured interview process, we are collecting data for the past seven days on the amount of time women spend on various activities, including unpaid labor. We are also collecting consumption data, including a detailed list of all recalled expenditures over the past seven days.

Negative Externalities. It is possible that time-saving vouchers could have negative externalities. The time that women save by receiving meals or laundry could be seen by other household members as a fungible resource, thereby increasing the amount of time that women spend completing unpaid labor for friends and extended family (versus for their own household). As a result, we cannot rule out the possibility that participants who receive time-saving vouchers

might interact less with their friends and family, undermining their subjective well-being. Time-saving services could also increase jealousy among extended family and friends and decrease the quality of respondents' social interactions during the study. To examine these possibilities, our baseline and endline surveys include exploratory questions about time spent with friends and family and satisfaction with these relationships over the course of the study.

We also explore possible negative externalities of receiving the unconditional cash transfers, including increases in temptation spending (e.g. consumption of alcohol and tobacco), gambling behavior, and a reduction in the motivation to work.^{lvii}

Individual Differences. The benefits of time-saving vouchers might be strongest for respondents with work skills that allow them to take on additional paid labor. We test for this possibility by examining whether treatment effects vary by level of education and sector of employment. The benefits of time-saving vouchers might also be strongest in contexts where there is a lot of market work available or where this work primarily consists of short-term contracts or micro-enterprises. We test for this possibility by examining whether treatment effects vary depending on whether women own or participate in micro-enterprises.

Mechanisms. There are at least two possible mechanisms for the proposed subjective well-being benefits of time-saving vouchers. Time-saving vouchers could increase well-being over the course of the study by 1) reducing the total number of hours spent engaging in unpaid labor or by enabling people to spend more of their time engaged in welfare-producing activities (e.g. paid work or socializing^{lviii}). In the current study, we provide preliminary correlational evidence for both of these possible mechanisms or boundary conditions.

Data Availability Statement. The datasets generated for these interim analyses are available through the Open Science Framework: <https://osf.io/pkyt9/>

Results

Pre-Processing Checks. First, we conducted a chi-square analysis to examine whether there was differential attrition for participants assigned to the neutral control, UCT, or time-saving conditions. Across the six weeks of the study, in the neutral control condition, 26 participants (15.4%) did not complete the study in its entirety. In the UCT condition, 4 participants (2.4%) did not complete the study in its entirety. In the time-saving condition, 9 participants (5.4%) did not complete the study in its entirety. The overall model was statistically significant, $\chi^2(1, N = 504) = 21.92, p < 0.001$. Follow-up analyses suggest that participants assigned to the neutral control condition were significantly more likely to drop-out than participants assigned to the UCT and time-saving conditions; which did not differ from each other, $p < 0.05$. These results suggest that participants who were randomly assigned to the neutral control condition were significantly more likely to drop-out over the course of the study.

We then examined whether there was differential attrition based on demographic variables that might be related to T2 subjective well-being, relationship conflict, and stress as follows: age, the average number of hours worked in the past 7 days, T1 subjective well-being, T1 perceived stress, T1 relationship satisfaction, T1 relationship conflict, T1 depression, whether participants were married or in a marriage-like relationship, household position, the average number of people living in the household, the average number of children living in the household, the average number of assets the participant owned or co-owned, the average number of meals skipped in the past month, and the average amount of money that the participant had spent in the past seven days (Table 1 for demographic characteristics of the full sample at baseline). Drop-outs did not differ from retained participants on any of these measures (Table 2).

Consistent with the results of our pilot study, there was minimal attrition overall; across

the six weeks of the experiment, 47 participants did not complete the study (7.1%). Given these lower-than-expected rates of attrition, it is unlikely that attrition meaningfully impacted our key results. Additionally, random assignment was successful at balancing conditions on relevant demographics including age, number of hours worked in the past 7 days, number of kids living at home, number of assets owned/co-owned, and amount earned in the past 6 months (Table 3).

A critical assumption of this research is that participants in the time-saving condition reported experiencing a lower burden of unpaid labor as compared to participants assigned to the unconditional cash transfer condition. To test this assumption, we conducted a between-subject ANOVA analysis³. This assumption was confirmed: participants who were randomly assigned to the time-saving condition reported that these services reduced their burden of unpaid labor significantly more ($M=-1.99$, $SD=1.35$) than participants who were randomly assigned to the UCT condition ($M=-0.80$, $SD=1.51$), $t(349) = 6.46$, $p < 0.001$, 95%[0.81, 1.56].

Primary Analyses

As described above, we defined SWB as a combination of high PA, low NA, and high feelings of SWL. Thus, our SWB composite was created by combining the standardized SWL + PA measures and subtracting the standardized NA measure. Controlling for baseline SWB, we found no evidence that the conditions differed on SWB at endline. We also examined the impact of condition assignment on perceived stress, relationship satisfaction and relationship conflict, as well as several measures that are distinct but related to SWB including depression and optimism.

Across all of these outcomes, we found evidence in favor of the null hypothesis: that is, after controlling for T1 measures, condition assignment did not significantly shape any of the outcomes measured in this study. See Table 4 and Table 5 for analyses.

³ Our final analyses will be conducted using Bayesian ANCOVA's. We report ANOVA's here due to the lower statistical power of the interim analyses in the current manuscript.

We also examined whether the specific way that we implemented the time-saving condition shaped our key outcomes of interest. Neither the type of time-saving service that we provided (i.e., meals or laundry) or the instructions that we provided (i.e., whether we asked participants to plan their free time or not) influenced study outcomes (Table 6 and Table 7). Lastly, we examined whether condition assignment shaped the amount of time that participants spent working, the amount of time participants spent socializing with friends and family, self-reported satisfaction with social relationships, and self-reported spending on discretionary and temptation goods. Condition assignment did not influence any of these outcomes (Table 8).

Exploratory Analyses

We then conducted additional analyses to assess whether the benefits of UCTs or time-saving vouchers differed based on individual characteristics (e.g., baseline levels of stress, dissatisfaction with housework, or education levels) or how participants spent time during the experiment (e.g., amount of time spent at work, time spent with friends and family). It is worth reiterating that these additional analyses are exploratory and are therefore underpowered to obtain conclusive findings—particularly in light of the interim results reported here.

Individual Characteristics. There was no evidence that time-saving vouchers (vs. UCTs) were more beneficial for women with higher levels of stress at T1 (Table 9). However, consistent with recent research (Whillans, Pow & Norton, 2019), there was weak evidence that time-saving services had a stronger benefit for relationship satisfaction than cash transfers when women experienced higher levels of stress at T1 (Table 9). There was no evidence that chore dissatisfaction at T1 predicted the benefits of time-saving services (Table 10). There was also no evidence that participants' education level (Table 11) or micro-entrepreneurship (Table 12) shaped the benefits of time-saving services compared to unconditional cash transfers.

Time-Use Characteristics. Further, time spent socializing with friends at T1 did not predict the benefits of time-saving vouchers vs. UCTs (Table 13). Yet, there was weak evidence that participants who spent more time working at T1 benefited more from the time-saving condition. Specifically, women who received time-saving vouchers (vs. UCT's), who worked more hours at T1, reported greater T2 subjective well-being and lower T2 depression (Table 14); although these results are marginally significant and should be interpreted with caution.

Mechanisms. As discussed in the Introduction, time-saving vouchers might only predict subjective well-being when 1) they reduce the total number of hours spent engaging in unpaid labor or 2) they enable people to spend more time engaged in welfare-producing activities like paid work or socializing. In the current study, time-saving vouchers were especially beneficial when they allowed women to spend more time completing paid work or when they allowed women to spend more time socializing, engaging in hobbies, or engaging in passive leisure activities like relaxing (Table 15). Time-saving vouchers were not more beneficial because they allowed women to spend less time on household production tasks like cooking or cleaning. These results provide evidence that time-saving vouchers promote well-being only when they enable mothers to spend time engaged in happiness producing activities like working or relaxing.

Additional Analyses. More generally, regardless of condition assignment, working mothers who spent more time engaged in active leisure (e.g., socializing with friends and family), completing necessities (e.g., childcare), and completing paid work reported greater subjective well-being, lower stress, and lower rates of depression (see Table 16a and Table 16b). These results suggest that any interventions that are designed to save working mothers time should guide them toward spending this free time in specific ways—such as by prompting participants to engage in active leisure activities or by providing employment opportunities.

Discussion Section

To the best of our knowledge, this is the first empirical investigation designed to assess the causal impact of time-saving services (vs. unconditional cash transfers) on the emotional health, stress, and relationship satisfaction of low-income working mothers living in Sub-Saharan Africa. Interim results from a pre-registered, sufficiently powered experiment with 613 participants⁴, found initial evidence in support of our null hypothesis, signifying that there were no differences between the experimental (time-saving and unconditional transfer) and control conditions in subjective well-being, stress, relationship satisfaction, or relationship conflict as measured over the course of a six-week study. Specifically, we found no benefit of time-saving or unconditional cash transfers on well-being. Although there might have been small effects of our treatments on our key outcomes of interest, because this study is still in the field, we were unable to detect effects of this magnitude. These null results occurred despite a growing body of evidence showing that time-saving services promote subjective well-being and reduce stress and showing that unconditional cash transfers promote subjective well-being. Why then do the interim results of our study fail to document any benefit of these treatments on well-being?

First and foremost, it is difficult to study the effects of subtle experimental interventions among chronically stressed populations^{lix}. Our participants frequently experienced unemployment, illness, and food insecurity. For example, at T1, participants had skipped an average of three meals in the past month because they couldn't afford to feed themselves or their families. Furthermore, at T1, 20% of the participants in our study reported CESD scores that were indicative of being at risk for clinical depression.^{lx} These rates are similar to other research

⁴ *N*=613 participants is the sample obtained using all implemented conditions (including time-saving no planning conditions) and reporting all primary measures. *N*=447 participants is the sample obtained using only pre-registered conditions (control, time-saving + planning, UCT) reporting full measures.

showing that respondents living in poverty in East Africa and globally exhibit higher rates of clinical depression, ranging from 15-45%.^{lxi} Thus, the null results we observed here may stem from the fact that it is hard to improve the well-being of a chronically stressed population using relatively small changes to participants' daily routines. Relatedly, we found initial evidence that working mothers who were assigned to the time-saving condition, and who worked more hours at T1, benefitted most from the time-saving intervention. These results suggest that physically and psychologically healthier working mothers might be better able to translate free time into paid work or other meaningful and productive activities, like socializing or childcare. Future work should enroll less chronically stressed populations and/or provide greater amounts of time and money for longer periods, to better understand the psychological benefits.

Secondly, we examined the benefits of receiving unconditional cash transfers and time-saving vouchers about one week after participants had received their final treatments. It is therefore possible that we missed a critical period in which the treatments exert the greatest impact on well-being. In the experimental study discussed in the introduction, time-saving services significantly improved subjective well-being by reducing stress. However, in this study, researchers conducted their well-being and stress measures at the end of the day, immediately after participants received the time-saving services (vs. spent money on a material purchase for themselves). Together with the results reported here, these studies suggest that there is likely a critical window whereby the subjective well-being benefits of time-saving (vs. cash transfers) emerge. For example, the benefits of time-saving services and cash transfers might only emerge immediately after receiving them and might not translate into longer-term changes in subjective well-being—particularly given the highly volatile and stressful daily events that participants in our sample often experienced. Future research should further explore these possibilities.

It is also possible that the positive effects of time-saving services were negated in this study by the time costs of obtaining them. The services involved friction costs—participants had to walk to Kibera Town Center to drop-off meal containers and pick up hot food (Meals) and to drop-off and pick-up laundry (Laundry). Although we tried to reduce these frictions by allowing flexible scheduling, sending text-message reminders, and recruiting participants who lived within a 30-minute walk to Kibera Town Center, it is possible that these logistical burdens undermined any potential benefits of the services. Given that the time-saving treatments might have posed extensive demands for a relatively small amount of time saved, it is critical for future research to study time-saving interventions of various lengths and intensities to understand the circumstances where time-saving services lead to improved psychological health, reduced stress, and improved relationship satisfaction for working mothers living at or below the poverty line.

Although our study does not provide evidence that small unconditional cash transfers improve the well-being of working mothers, it is important to acknowledge the numerous benefits of cash transfers. Experimental research suggests that cash transfers and in-kind goods improve a number of outcomes for working women living in developing countries including subjective well-being and employment outcomes. In light of our interim findings, more experimental research is needed to understand whether, when, and how transfers of various types—from small UCTs to vouchers for time-saving services like cooking and cleaning—benefit working mothers who are experiencing significant time and material constraints.

Conclusion

Time-saving services and unconditional cash transfers might not always yield well-being or stress-reduction benefits. The interim results presented here highlight the critical importance of employing experimental methods to examine the causal benefit of cash transfers and other

forms of in-kind aid. These data also suggest that previous correlational and causal evidence linking time-saving services to well-being might not extend to individuals living in urban areas in developing countries. Future work should causally examine individual differences in reaping the rewards of small cash and non-cash goods and investigate the characteristics of time-saving services that most reliably improve well-being, reduce stress, promote work-life balance, and improve relationship satisfaction for working moms living at or below the poverty line.

In conclusion, more rigorous, highly-powered experimental work is needed to understand when and for whom non-cash transfers—like time saving services—bolster well-being among those who could benefit most: working mothers experiencing time and material poverty.

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Table 1. Demographic Characteristics of Sample at T1

Variable	Demographics at T1
Age	$M=38.23$ (9.35), $RG: 20-69$
# of Work Hours in Past 7 Days	$M=32.13$ (17.67), $RG: 0-60$
# of Unpaid Work Hours in Past 7 Days	$M=35.20$ (22.59), $RG: 1.75-141.00$
T1 SWB	$M=0.002$ (2.46), $RG: -6.10-7.88$
T1 PSS	$M=3.23$ (0.50), $RG: 2.00-4.60$
T1 Relationship Satisfaction ^a	$M=3.25$ (1.18), $RG: 0-5.00$
T1 Relationship Conflict ^a	$M=1.09$ (0.98), $RG: 0-4.00$
T1 CESD	$M=2.19$ (0.46), $RG: 1.15-3.75$
% Married or Co-Habiting	58.6% (13.1% widowed)
% Woman Manages Household	41.7% (56.2% spouse)
% Woman Manages Finances	57.0% (4.4% spouse)
# Kids Living in Household	$M=3.17$ (1.45), $RG: 1-11$
# People Living in Household	$M=4.60$ (1.56), $RG: 1-12$
Personal Income Earned in Past 6 Months	$M=48,483.48$ KSH (184,654.56), $RG: 0-3.3M$
# of Assets (includes Co-Owned)	$M=3.53$ (1.52), $RG: 0-9$
# Meals Skipped in Past Month	$M=2.80$ (2.33), $RG: 0-7$
KSH on Discretionary Items in Past 7 days	$M=5,333.68$ KSH (5,276.87), $RG: 110-35,850$

Note. 1,000 Kenyan Shillings (KSH)=9.89 USD. Thus, women in this sample reported making approx. \$479.50 USD in the past six-months. ^aAs noted in text, for women who did not have a romantic partner, they responded to these items regarding their closest personal relationship.

Table 2. Demographic Characteristics of Drop-outs vs. Non-Drop-outs

	Study Drop-outs (<i>N</i> = 47; 7.1%)	Retained (<i>N</i> = 613; 92.9%)	Statistics
Age	36.26 (8.22)	38.38 (9.42)	$t(654)=-1.48, p=0.139$
# Work Hours Past 7 Days	35.60 (18.43)	31.86 (17.60)	$t(553)=1.29, p=0.198$
# of Unpaid Work Past 7 Days	34.86 (18.90)	35.23 (22.87)	$t(644)=-0.11, p=0.913$
T1 SWB	0.14 (2.38)	-0.01 (2.47)	$t(645)=0.40, p=0.691$
T1 PSS	3.12 (0.50)	3.24 (0.49)	$t(645)=-1.51, p=0.131$
T1 Relationship Satisfaction	3.18 (1.14)	3.25 (1.19)	$t(637)=-0.42, p=0.678$
T1 Relationship Conflict	1.13 (0.94)	1.09 (0.98)	$t(645)=0.25, p=0.802$
T1 CESD	2.18 (0.45)	2.19 (0.46)	$t(657)=-0.14, p=0.892$
% Married or Co-Habiting	57.4%	58.7%	$X^2(N=5,659)=0.83, p=0.975$
% Woman Manages Household	39.1%	41.9%	$X^2(N=1,657)=0.14, p=0.713$
% Woman Manages Finances	54.3%	57.2%	$X^2(N=1,656)=0.143, p=0.705$
# Kids Living in Household	2.98 (1.33)	3.19 (1.46)	$t(655)=-0.94, p=0.347$
# People Living in Household	4.54 (1.38)	4.60 (1.57)	$t(655)=-0.24, p=0.810$
Income Earned in Past 6 Months	56,189.13 KSH (76,680.11)	47,903.35 KSH (190,341.81)	$t(655)=0.29, p=0.769$
# of Assets (+Co-Owned)	3.39 (1.64)	3.54 (1.51)	$t(647)=-0.64, p=0.526$
# Meals Skipped in Past Month	2.61 (2.34)	2.81 (2.33)	$t(655)=-0.57, p=0.573$
KSH on Discretionary Items in Past 7 days	5,249.66 KSH (4,572.99)	5,340.14 KSH (5,330.32)	$t(657)=-0.11, p=0.910$

Note. To adjust for multiple comparisons, we have used Bonferroni correction. Using this correction, the significance level for these comparisons is $p < 0.004$. Thus, we can determine that dropouts did not significantly differ from non-dropouts on any measure.

Table 3. Demographic Characteristics Assigned to Experimental Conditions at T1

	Neutral Control (N=168)	UCT (N=168)	Time-Saving (N=165)	Model Statistics
Age	38.92 (9.80)	38.86 (9.49)	37.67 (9.18)	$F(2, 500)=0.92, p=0.401$
# Work Hours Past 7 Days	31.82 (17.42)	31.50 (17.81)	32.39 (18.40)	$F(2,419)=0.09, p=0.916$
# of Unpaid Work Past 7 Days	36.10 (23.65)	34.10 (21.51)	34.88 (22.16)	$F(2,494)=0.33, p=0.717$
T1 SWB	0.11 (2.52)	-0.05 (2.50)	0.11 (2.29)	$F(2,497)=0.22, p=0.801$
T1 PSS	3.20 (0.49)	3.24 (0.49)	3.23 (0.49)	$F(2,497)=0.19, p=0.828$
T1 Relationship Satisfaction	3.08 (1.26) ^a	3.43 (1.11) ^b	3.24 (1.19) ^{a,b}	$F(2,490)=3.45, p=0.032$
T1 Relationship Conflict	1.18 (1.08)	1.01 (0.97)	1.11 (0.94)	$F(2,497)=1.23, p=0.293$
T1 CESD	2.19 (0.46)	2.18 (0.49)	2.19 (0.45)	$F(2,504)=0.01, p=0.994$
% Married or Co-Habiting	37.5%	30.9%	31.6%	$\chi^2=9.89, p=0.273$
% Woman Manages Household	30.5%	35.9%	33.6%	$\chi^2=3.59, p=0.166$
% Woman Manages Finances	34.9%	48.8%	45.5%	$\chi^2=7.23, p=0.027$
# Kids Living in Household	3.23 (1.59)	3.36 (1.54)	3.02 (1.34)	$F(2,502)=2.18, p=0.114$
# People Living in Household	4.64 (1.63)	4.77 (1.70)	4.44 (1.41)	$F(2,502)=1.78, p=0.169$
Income Earned in Past 6 Months	39,936 (46,853)	39,013(35,937)	77,760 (361,223)	$F(2,502)=1.84, p=0.159$
# of Assets (+Co-Owned)	3.61 (1.36)	3.60 (1.57)	3.43 (1.60)	$F(2,495)=0.83, p=0.436$
# Meals Skipped in Past Month	2.57 (2.29)	2.95 (2.47)	2.86 (2.31)	$F(2,502)=1.19, p=0.305$
KSH on Discretionary in Past 7 days	4792.17 (4808.77)	6024.92 (5721.82)	5166.54 (4573.83)	$F(2,504)=2.63, p=0.073$

Note. Significant differences are indicated by subscripts. There was a marginal difference between the neutral and UCT conditions on T1 relationship satisfaction, $p = 0.009$. To adjust for multiple comparisons, we have used Bonferroni correction. Using this correction, the significance level for these comparisons is $p < 0.004$. Thus, there were no statistically significant differences across conditions.

Table 4. Between Condition Differences at Endline, Controlling for Baseline

Variable	Neutral Control (N=106)	UCT (N=133)	Time-Saving (N=117)	Model Statistics
SWB	0.05 (2.44)	0.04 (2.60)	-0.30 (2.26)	$F(2,355)=0.90, p=0.408$
PA	3.03 (0.82)	3.06 (0.83)	2.97 (0.81)	$F(2,461)=0.86, p=0.426$
NA	2.89 (0.90)	2.78 (0.84)	3.01 (0.90)	$F(2,461)=2.70, p=0.068$
SWL	4.71 (1.21)	4.63 (1.37)	4.61 (1.22)	$F(2,359)=0.03, p=0.968$
CESD	2.10 (0.50)	2.09 (0.49)	2.09 (0.52)	$F(2,359)=0.08, p=0.927$
PSS	3.00 (0.59) ^{a,b}	2.90 (0.63) ^a	3.07 (0.64) ^b	$F(2,454)=3.45, p=0.033$
LOTR	2.03 (0.75)	1.86 (0.63)	2.02 (0.69)	$F(2,359)=2.84, p=0.060$
R-SAT	3.15 (1.08)	3.23 (1.15)	3.15 (1.18)	$F(2,448)=0.14, p=0.869$
R-CON	0.67 (0.86)	0.60 (0.78)	0.63 (0.79)	$F(2,454)=0.07, p=0.931$

Note. Significant between condition differences are indicated by subscripts. There was a marginal difference between the UCT and time-saving conditions on T2 stress, $p = 0.011$. To adjust for multiple comparisons, we have used Bonferroni correction. Using this correction, the significance level for these comparisons is $p < 0.004$. Thus, there were no statistically significant differences across conditions. Some of the analyses reported above are based on a higher number of participants (i.e., PA, NA, R-SAT, R-CON). For participants whose endline measures were collected over the phone, we collected only our primary, pre-registered measures.

Table 5. Between Condition Differences at Endline Including All Time-Saving Conditions, Controlling for Baseline

Variable	Neutral Control (<i>N</i> =106)	UCT (<i>N</i> =133)	Time-Saving (<i>N</i> =233)	Model Statistics
SWB	0.05 (2.44)	0.04 (2.60)	-0.45 (2.41)	$F(2,461)=2.01, p=0.135$
PA	3.03 (0.82)	3.06 (0.83)	2.96 (0.84)	$F(2,608)=1.04, p=0.354$
NA	2.89 (0.90) ^{a,b}	2.78 (0.84) ^a	3.00 (0.90) ^b	$F(2,608)=3.01, p=0.050$
SWL	4.71 (1.22)	4.63 (1.37)	4.53 (1.30)	$F(2,470)=0.31, p=0.732$
CESD	2.10 (0.50)	2.09 (0.49)	2.07 (0.50)	$F(2,470)=0.60, p=0.545$
PSS	3.00 (0.59) ^{a,b}	2.90 (0.63) ^a	3.03 (0.64) ^b	$F(2,595)=2.53, p=0.081$
LOTR	2.03 (0.75) ^a	1.86 (0.63) ^b	1.98 (0.70) ^{a,b}	$F(2,470)=2.30, p=0.101$
R-SAT	3.15 (1.08)	3.23 (1.15)	3.15 (1.15)	$F(2,588)=0.16, p=0.847$
R-CON	0.67 (0.86)	0.60 (0.78)	0.67 (0.79)	$F(2,596)=0.31, p=0.736$

Note. Significant between condition differences are indicated by subscripts. There was a marginal difference between the UCT and time-saving conditions on T2 NA and T2 PSS. There was also a marginal difference between the UCT and control condition on T2 LOTR, $ps > 0.02$. To adjust for multiple comparisons, we used Bonferroni correction. Using this correction, the significance level for these comparisons is $p < 0.004$. Thus, there were no statistically significant differences across conditions. Some of the analyses reported above are based on a higher number of participants (i.e., PA, NA, R-SAT, R-CON). For participants whose endline measures were collected over the phone, we collected only our primary, pre-registered measures.

Table 6. Comparing the Time-saving “Planning” to the Time-Saving “No-Planning” Conditions

Variable	Time-Saving No Planning (N=117)	Time-Saving – Planning (N=106)	Model Statistics
SWB	-0.30 (2.26)	-0.61 (2.56)	$F(2,223)=0.22, p=0.637$
PA	2.97 (0.81)	2.94 (0.87)	$F(1,301)=0.01, p=0.923$
NA	3.01 (0.90)	2.98 (0.93)	$F(1,301)=0.13, p=0.718$
SWL	4.61 (1.22)	4.44 (1.38)	$F(1,227)=0.67, p=0.413$
CESD	2.09 (0.52)	2.04 (0.48)	$F(1,227)=1.48, p=0.225$
PSS	3.07 (0.64)	2.98 (0.65)	$F(1,294)=1.70, p=0.193$
LOTR	2.02 (0.69)	1.93 (0.70)	$F(1,227)=0.97, p=0.327$
R-SAT	3.15 (1.18)	3.15 (1.12)	$F(1,292)=0.001, p=0.995$
R-CON	0.63 (0.75)	0.72 (0.82)	$F(1,284)=1.94, p=0.165$

Table 7. Comparing the Four Versions of Time-Saving Treatments (Laundry vs. Meals vs. Planning vs. No Planning)

Variable	Time-Saving - Meals	Time-Saving – Laundry	Time-Saving – Meals+Planning	Time-Saving – Laundry+Planning	Model Statistics
SWB	-0.55 (2.27)	-0.05 (2.25)	-0.77 (2.79)	-0.44 (2.29)	$F(3,223)=0.39, p=0.760$
PA	2.94 (0.79)	3.00 (0.83)	2.96 (0.98)	2.92 (0.73)	$F(3,299)=0.09, p=0.966$
NA	3.05 (0.90)	2.97 (0.91)	2.99 (0.97)	2.97 (0.88)	$F(3,299)=0.13, p=0.943$
SWL	4.55 (1.25)	4.66 (1.18)	4.43 (1.42)	4.45 (1.35)	$F(3,225)=0.29, p=0.834$
CESD	2.14 (0.48)	2.04 (0.55)	2.09 (0.50)	1.99 (0.47)	$F(3,225)=0.85, p=0.470$
PSS	3.12 (0.64)	3.03 (0.64)	2.91 (0.66)	3.06 (0.63)	$F(3,292)=1.52, p=0.210$
LOTR	1.97 (0.69)	2.07 (0.70)	2.04 (0.70)	1.82 (0.68)	$F(3,225)=1.48, p=0.221$
R-SAT	3.14 (1.11)	3.17 (1.25)	3.01 (1.22)	3.31 (0.99)	$F(3,290)=0.94, p=0.420$
R-CON	0.65 (0.70)	0.60 (0.80)	0.65 (0.79)	0.67 (0.79)	$F(3,292)=0.926, p=0.428$

Table 8. Additional Between Condition Differences, Controlling for Baseline

Variable	Neutral Control (<i>N</i> =143)	UCT (<i>N</i> =165)	Time-Saving (<i>N</i> =157)	Model Statistics
Paid Labor in Past Week	9.95 (48.70)	15.06 (42.88)	13.11 (46.82)	$F(2,297)=0.30, p=0.74$
Unpaid Labor in Past Week	29.66 (17.48)	29.81 (21.24)	28.78 (21.77)	$F(2,352)=0.09, p=0.917$
Time w/ Friends in Past Week	1.01 (15.24)	1.50 (14.66)	2.62 (9.97)	$F(2,461)=0.55, p=0.576$
Time w/ Family in Past Week	10.28 (21.68)	6.45 (27.18)	4.37 (31.29)	$F(2,460)=1.98, p=0.139$
Satisfaction w/ Friends in Past Week	1.32 (0.55)	1.50 (0.76)	1.54 (0.72)	$F(2,359)=2.94, p=0.054$
Satisfaction w/ Family in Past Week	1.58 (0.77)	1.62 (0.88)	1.58 (0.85)	$F(2,359)=0.004, p=1.00$
Temptation Spending in Past Week	437.26 (873.50)	352.07 (763.50)	396.69 (802.21)	$F(2,460)=0.48, p=0.618$
Discretionary Spending in Past Week	3068.46 (2938.79)	4090.88 (8265.17)	3567.55 (3904.85)	$F(2,461)=0.65, p=0.524$

Note. Some analyses are based on a higher number of participants (i.e., Time w/ Friends/Family, Temptation, Discretionary spending). For participants whose endline measures were collected over the phone, we collected only our primary, pre-registered measures.

Table 9. Stress by Condition Moderation Analyses Predicting T2 Outcomes

Variable	Interaction Statistics	95% CI
SWB	R^2 Change = .0037, $F(1,351) = 1.48, p=0.020$	[-1.66, 0.39]
PA	R^2 Change = .0002, $F(1,454) = 0.10, p=0.748$	[-0.02, 0.22]
NA	R^2 Change = .0017, $F(1, 454) = 0.82, p = 0.365$	[-0.18, 0.50]
SWL	R^2 Change = .001, $F(1, 351) = 0.64, p = 0.425$	[-0.72, 0.30]
CESD	R^2 Change = .003, $F(1, 351) = 1.39, p = 0.239$	[-0.31, 0.56]
PSS	R^2 Change = .0001, $F(1, 455) = 0.0001, p = 1.000$	[-0.24, 0.24]
LOTR	R^2 Change = .008, $F(1, 351) = 2.87, p = 0.091$	[-0.04, 0.54]
R-SAT	R^2 Change = .0067, $F(1, 447) = 3.58, p = 0.059$	[-0.02, 0.82]
R-CON	R^2 Change = .0005, $F(1, 454) = 0.27, p = 0.606$	[-0.21, 0.36]

Note. Given that our main comparison of interest was time vs. cash, the condition coding was as follows: 1=Time-Saving, 0=UCT. All models were calculated using Model 1 in Preacher & Hayes Macro with 1000 Bootstrapped samples, products were mean centered. All models included the following terms: Con X PSST1 to predict the key outcomes, controlling for the T1 measure of interest.

Table 10. Chore Dissatisfaction by Condition Moderation Analyses Predicting T2 Outcomes

Variable	Interaction Statistics	95% CI
SWB	R^2 Change = .0035, $F(1, 351) = 1.40, p = 0.237$	[-1.02, 0.25]
PA	R^2 Change = .0001, $F(1, 464) = 0.04, p = 0.847$	[-0.22, 0.18]
NA	R^2 Change = .0003, $F(1, 464) = 0.12, p = 0.731$	[-0.18, 0.25]
SWLS	R^2 Change = .0018, $F(1, 361) = 0.83, p = 0.365$	[0.30, 0.45]
CESD	R^2 Change = .0001, $F(1, 361) = .030, p = 0.862$	[0.37, 0.57]
PSS	R^2 Change = .00001, $F(1, 454) = 0.001, p = 0.975$	[0.20, 0.43]
LOTR	R^2 Change = .003, $F(1, 361) = 1.21, p = 0.274$	[0.005, 0.20]
R-SAT	R^2 Change = .0009, $F(1, 447) = 0.48, p = 0.489$	[-0.17, 0.35]
R-CON	R^2 Change = .0010, $F(1, 454) = 0.55, p = 0.459$	[-0.24, 0.11]

Note. Given that our main comparison of interest was time vs. cash, the condition coding was as follows: 1=Time-Saving, 0=UCT. All models were calculated using Model 1 in Preacher & Hayes Macro with 1000 Bootstrapped samples, products were mean centered. All models included the following terms: Con X ChoreSatisfactionT1 to predict outcomes, controlling for the T1 measure of interest.

Table 11. Education by Condition Moderation Analyses Predicting T2 Outcomes

Variable	Interaction Statistics	95% CI
SWB	R^2 Change = .0003, $F(1, 350) = 0.11, p = 0.742$	[-0.12, 0.17]
PA	R^2 Change = .0027, $F(1, 463) = 1.30, p = 0.254$	[-0.07, 0.02]
NA	R^2 Change = .0004, $F(1, 463) = 0.20, p = 0.654$	[-0.04, 0.06]
SWL	R^2 Change = .0002, $F(1, 360) = 0.08, p = 0.773$	[-0.06, 0.08]
CESD	R^2 Change = .0006, $F(1, 360) = 0.27, p = 0.601$	[-0.03, 0.02]
PSS	R^2 Change = .0006, $F(1, 453) = 0.28, p = 0.600$	[-0.02, 0.04]
LOTR	R^2 Change = .0005, $F(1, 360) = 0.17, p = 0.678$	[-0.004, 0.20]
R-SAT	R^2 Change = .0001, $F(1, 446) = 0.04, p = 0.842$	[0.29, 0.47]
R-CON	R^2 Change = .003, $F(1, 453) = 1.71, p = 0.192$	[-0.07, 0.01]

Note. Given that our main comparison of interest was time vs. cash, the condition coding was as follows: 1=Time-Saving, 0=UCT. All models were calculated using Model 1 in Preacher & Hayes Macro with 1000 Bootstrapped samples, products were mean centered. All models included the following terms: Con X EducationT1 to predict outcomes, controlling for the T1 measure of interest.

Table 12. Small business ownership by condition moderation analyses predicting T2 outcomes.

Variable	Interaction Statistics	95% CI
SWB	R^2 Change = .0002, $F(1, 349) = 0.06, p = 0.805$	[-1.20, 0.93]
PA	R^2 Change = .001, $F(1, 462) = 0.52, p = 0.473$	[-0.45, 0.21]
NA	R^2 Change = .0003, $F(1, 462) = 0.12, p = 0.727$	[-0.29, 0.41]
SWL	R^2 Change = .00001, $F(1, 359) = 0.005, p = 0.942$	[-0.54, 0.50]
CESD	R^2 Change = .0004, $F(1, 359) = 0.20, p = 0.658$	[-0.24, 0.15]
PSS	R^2 Change = .004, $F(1, 452) = 1.77, p = 0.185$	[-0.08, 0.42]
LOTR	R^2 Change = .00001, $F(1, 359) = 0.01, p = 0.930$	[-0.31, 0.29]
R-SAT	R^2 Change = .0006, $F(1, 445) = 0.33, p = 0.567$	[-0.56, 0.31]
R-CON	R^2 Change = .00001, $F(1, 452) = 0.00001, p = 1.00$	[-0.29, 0.29]

Note. Given that our main comparison of interest was time vs. cash, the condition coding was as follows: 1=Time-Saving, 0=UCT. All models were calculated using Model 1 in Preacher & Hayes Macro with 1000 Bootstrapped samples, products were mean centered. All models included the following terms: Con X BusinessT1 to predict outcomes, controlling for the T1 measure of interest.

Table 13. Time spent with friends by condition moderation analyses predicting T2 outcomes.

Variable	Interaction Statistics	95% CI
SWB	R^2 Change = .0020, $F(1, 351) = 0.81, p = 0.370$	[-0.06, 0.15]
PA	R^2 Change = .0001, $F(1, 464) = 0.28, p = 0.868$	[-0.01, 0.01]
NA	R^2 Change = .0020, $F(1, 464) = 0.96, p = 0.327$	[-0.009, 0.03]
SWLS	R^2 Change = .0021, $F(1, 361) = 0.96, p = 0.329$	[-0.02, 0.07]
CESD	R^2 Change = .0001, $F(1, 361) = 0.05, p = 0.821$	[-0.02, 0.02]
PSS	R^2 Change = .003, $F(1, 454) = 0.14, p = 0.712$	[-0.01, 0.01]
LOTR	R^2 Change = .0018, $F(1, 361) = 0.66, p = 0.417$	[-0.04, 0.02]
R-SAT	R^2 Change = .0009, $F(1, 447) = 0.47, p = 0.496$	[-0.03, 0.01]
R-CON	R^2 Change = .0004, $F(1, 454) = 0.19, p = 0.663$	[-0.02, 0.01]

Note. Given that our main comparison of interest was time vs. cash, the condition coding was as follows: 1=Time-Saving, 0=UCT. All models were calculated using Model 1 in Preacher & Hayes Macro with 1000 Bootstrapped samples, products were mean centered. All models included the following terms: Con X SocializingT1 to predict outcomes, controlling for the T1 measure of interest.

Table 14. Time spent at work by condition moderation analyses predicting T2 outcomes.

Variable	Interaction Statistics	95% CI
SWB	R^2 Change = 0.01, $F(1, 293) = 3.57, p = 0.060$	[-0.06, 0.001]
PA	R^2 Change = .005, $F(1, 391) = 2.12, p = 0.146$	[-0.02, 0.003]
NA	R^2 Change = .0030, $F(1, 391) = 1.20, p = 0.274$	[-0.005, 0.02]
SWL	R^2 Change = .006, $F(1, 301) = 2.45, p = 0.118$	[-0.03, 0.003]
CESD	R^2 Change = .010, $F(1, 301) = 3.70, p = 0.055$	[-0.07, 0.25]
PSS	R^2 Change = .007, $F(1, 383) = 0.30, p = 0.585$	[0.16, 0.41]
LOTR	R^2 Change = .001, $F(1, 301) = 0.32, p = 0.572$	[-0.04, 0.17]
R-SAT	R^2 Change = .00001, $F(1, 378) = 0.02, p = 0.956$	[-0.01, 0.01]
R-CON	R^2 Change = .0007, $F(1, 383) = 0.30, p = 0.582$	[-0.01, 0.01]

Note. Given that our main comparison of interest was time vs. cash, the condition coding was as follows: 1=Time-Saving, 0=UCT. All models were calculated using Model 1 in Preacher & Hayes Macro with 1000 Bootstrapped samples, products were mean centered. All models included the following terms: Con X WorkHoursT1 to predict outcomes, controlling for the T1 measure of interest.

Table 15. Correlations Between Time-use and Outcomes at T2, Controlling for T1 variables. Within Time-Saving Only ($N=270$)

	Active Leisure	Passive Leisure	Work & Commuting	Necessities	Phone & Computer	Eating	Other
1. SWB	0.07	-0.06	0.21***	-0.06	-0.08	0.04	-0.13†
2. PA	0.17**	0.07	0.13*	-0.003	-0.03	-0.02	-0.06
3. NA	-0.08†	-0.02	-0.16**	0.005	0.04	0.02	0.08
4. SWL	0.05	-0.006	0.13†	-0.05	-0.04	0.04	-0.11
5. CESD	-0.02	-0.07	-0.005	-0.02	0.08	-0.16*	0.07
6. PSS	-0.10†	-0.11*	-0.16**	0.04	0.03	-0.05	0.04
7. LOTR	-0.02	-0.07	0.03	-0.14*	0.03	-0.05	0.002
8. R-SAT	0.09	0.06	0.02	-0.04	-0.05	-0.08	0.13†
9. R-CON	-0.03	0.07	-0.05	0.03	0.015	-0.04	0.04

† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$

Note. We classified respondents' time-use activities in the last 24 hours into composites in line with previous research (Kahneman et al. 2006). Active leisure is a composite of praying, socializing, intimate relations, exercise, and hobbies. Passive leisure is a composite of watching TV, napping and resting, and doing nothing. Necessities is a composite of shopping, food preparation and cooking, childcare, and household chores. Work and commuting is a composite of time spent working and commuting. Eating is the amount of time that respondents spent eating. We included time spent on the phone and time spent on the computer. We also calculated "other" as a composite measure of a self-selected "other" category as determined by respondents and time spent waiting.

Table 16a. Correlations Between Time-use and Outcomes at T1 ($N=647$)

	Active Leisure	Passive Leisure	Work & Commuting	Necessities	Phone & Computer	Eating	Other
1. SWB	0.11**	0.05	0.07	0.09*	0.14**	-0.02	0.0001
2. PA	0.12**	0.06	0.08*	0.07†	0.13**	-0.05	0.007
3. NA	-0.14**	-0.01	-0.12**	-0.003	-0.08†	0.10*	0.005
4. SWL	0.02	0.05	-0.01	0.15**	0.11**	0.10*	-0.005
5. CESD	-0.06	-0.04	-0.06	-0.04	-0.06	0.10*	0.05
6. PSS	-0.10*	-0.04	-0.04	-0.06	-0.06	0.05	0.06
7. LOTR	-0.19**	-0.01	-0.02	0.09*	-0.06	0.12**	0.05
8. R-SAT	0.12**	-0.03	-0.02	-0.03	-0.05	-0.04	0.04
9. R-CON	0.06	0.12*	0.05	0.10*	0.08*	0.17**	0.001

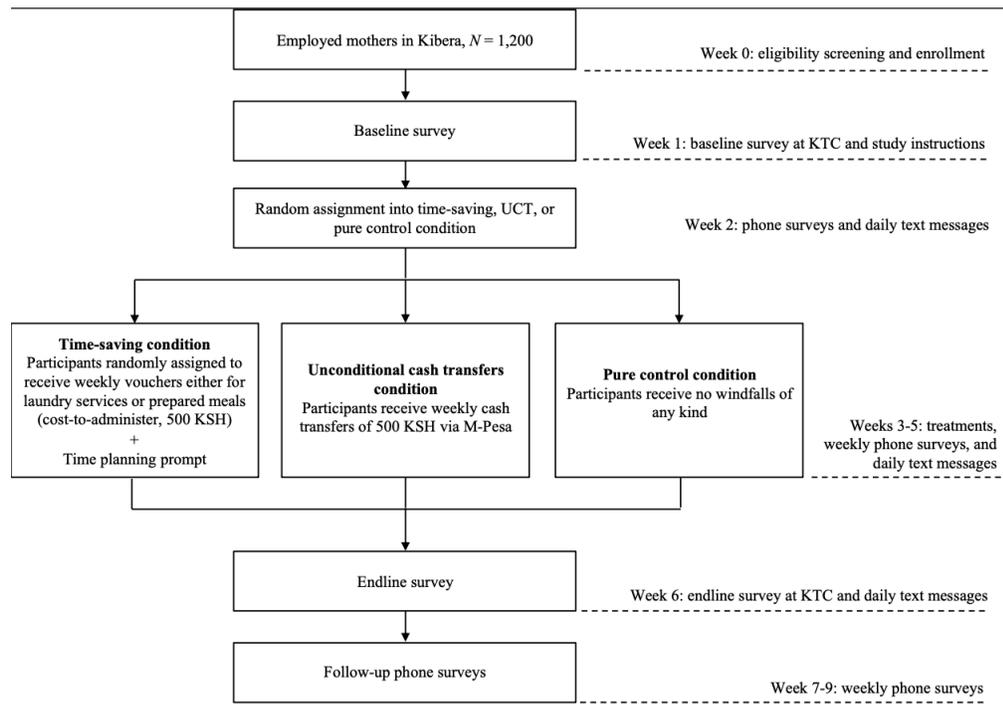
† $p < 0.10$; * $p < 0.05$; ** $p < 0.01$, *** $p < 0.001$

Table 16b. Correlations Between Time-use and Outcomes at T2 ($N=447$)

	Active Leisure	Passive Leisure	Work & Commuting	Necessities	Phone & Computer	Eating	Other
1. SWB	-0.04	-0.09*	0.14**	0.02	0.02	0.01	-0.06
2. PA	0.04	-0.01	0.10*	0.04	0.05	-0.01	-0.06
3. NA	0.01	0.05	-0.10*	-0.03	-0.005	0.01	-0.08
4. SWL	-0.05	-0.04	0.12**	0.03	0.04	0.04	-0.03
5. CESD	0.05	0.03	-0.09†	0.001	0.03	-0.06	0.05
6. PSS	-0.01	-0.01	-0.10*	0.01	0.02	0.007	0.04
7. LOTR	0.01	-0.01	-0.03	-0.08†	-0.001	-0.10*	0.02
8. R-SAT	0.08*	0.03	0.01	-0.01	0.005	0.06	0.06
9. R-CON	0.001	0.03	-0.05	0.02	0.03	-0.01	0.05

Note. We classified respondents' time-use activities in the last 24 hours into composites in line with previous research (Kahneman et al. 2006). Active leisure is a composite of praying, socializing, intimate relations, exercise, and hobbies. Passive leisure is a composite of watching TV, napping and resting, and doing nothing. Necessities is a composite of shopping, food preparation and cooking, childcare, and household chores. Work and commuting is a composite of time spent working and commuting. Eating is the amount of time that respondents spent eating. We included time spent on the phone and time spent on the computer. We also calculated "other" as a composite measure of a self-selected "other" category as determined by respondents and time spent waiting.

Figure 1. Overview of Study Design and Timeline



Note. The weekly phone call and text message data has not yet been analyzed and is therefore not discussed in text.

Supplementary Methods

Pre-registered Measures

Subjective Well-being (SWL + adapted SPANE)⁶²

1. Please imagine a ladder with steps numbered from zero at the bottom to ten at the top. Suppose we say that the top of the ladder represents the best possible life for you and the bottom of the ladder represents the worst possible life for you. If the top step is 10 and the bottom step is 0, on which step of the ladder do you feel you personally stand at the present time (*right now*)?

0 1 2 3 4 5 6 7 8 9 10

Bottom
Step

Top Step

2. Please think about what you have been doing and experiencing during the PAST FOUR WEEKS. Then report how much you experienced each of the following feelings, using the scale below. For each item, select a number from 1 to 5, and indicate that number on your response sheet.

1 2 3 4 5

Very rarely/never

Rarely

Sometimes

Often

Very often/always

- Positive
- Negative
- Good
- Bad
- Pleasant
- Unpleasant

Perceived Stress Scale⁶³

The questions in this scale ask you about your feelings and thoughts during THE PAST FOUR WEEKS. In each case, you will be asked to indicate your response by telling me **how often** you felt or thought a certain way. Although some of the questions are similar, there are slightly differences between these questions and you should treat each question separately. The best approach is to answer quickly. That is, don't try to count up the number of times you felt a particular way but rather indicate the choice that seems like a good estimate. *1=Never; 2=Almost never, 3=Sometimes, 4=Fairly often, 5=Very Often*

1. In the PAST FOUR WEEKS, how often have you felt that you were unable to control the important things in your life?
2. In the PAST FOUR WEEKS, how often have you felt confident about your ability to handle your personal problems?
3. In the PAST FOUR WEEKS, how often have you been upset because of something that happened unexpectedly?
4. In the PAST FOUR WEEKS, how often have you felt nervous and stressed?
5. In the PAST FOUR WEEKS, how often have you felt that things were going your way?
6. In the PAST FOUR WEEKS, how often have you felt you felt that you could not cope with all the things you had to do?
7. In the PAST FOUR WEEKS, how often have you been able to control irritations in your life?
8. In the PAST FOUR WEEKS, how often have you felt like you were on top of things?
9. In the PAST FOUR WEEKS, how often have you been angered about things that were outside your control?
10. In the PAST FOUR WEEKS, how often have you felt difficulties were piling up so high that you could not overcome them?

Relationship Conflict – negative interaction subscale of the networks of relationships inventory⁶⁴

What is your marital status?

- Single
- Married or in a marriage-like relationship
- Widowed
- Divorced/Separated
- Never Married
- Refused to Answer

If married or in a marriage like relationship, participants answer the following questions about their partner. If single, widowed, divorced/separated, participants answer with respect to their closest personal relationship. As described in text, we will only include responses from participants in a marriage or marriage-like relationship in our pre-registered analysis.

Relationship conflict with partner [or closest personal relationship if not married or in marriage-like relationship]:

Most people have disagreements in their relationships. Please respond to each of the following question about the PAST FOUR WEEKS on a scale from 1=little or none, 2=somewhat, 3=very much, 4=extremely much, 5=the most.

1. How much do you and this person get upset or mad at each other?
2. How much do you and this person disagree and quarrel?
3. How much do you and this person argue with each other?
4. How much do you and this person say mean or harsh things to each other?
5. How much do you and this person point out each others' faults or put each other down?
6. How much do you and this person criticize each other?
7. How much do you and this person hassle or nag one another?
8. How much do you and this person get on each other's nerves?
9. How much do you and this person get annoyed with each other's behavior?

All Other Measures (Not Pre-Registered)

Relationship conflict with family (other than partner)

Now we would like to ask you about your relationship with your family (other than your partner). Please respond to each of the following questions about the PAST FOUR WEEKS on a scale from 1=little or none, 2=somewhat, 3=very much, 4=extremely much, 5=the most.

1. How much do you and your family get upset with each other?
2. How much do you and your family disagree or quarrel?
3. How much do you and your family argue with each other?

Relationship conflict with friends

Now we would like to ask you about your relationship with your friends. Please respond to each of the following questions about the PAST FOUR WEEKS on a scale from 1=little or none, 2=somewhat, 3=very much, 4=extremely much, 5=the most.

1. How much do you and your friends get upset with each other?
2. How much do you and your friends disagree or quarrel?
3. How much do you and your friends argue with each other?

Time use

Conducted in both baseline and endline surveys

Note: To match the weekly phone calls, we will ask these questions about the PAST SEVEN DAYS.

1. Thinking about the PAST SEVEN DAYS, on average, what time did you wake up?

2. Thinking about the PAST SEVEN DAYS, on average, what time did you go to sleep? _____
3. Thinking about the PAST SEVEN DAYS, please estimate the NUMBER OF HOURS that you were AWAKE that you spent engaged in each of the activities listed.

Note to Field Officer:

If the time spent on any activity sums up to less than an hour in the PAST SEVEN DAYS, then please indicate the number of MINUTES out of an HOUR participants engaged in the activity.

- Commuting
- Working
- Shopping
- Preparing food
- Doing housework
- Taking care of your children
- Eating
- Praying/worshipping/meditating
- On the phone
- Watching TV
- Nap/resting
- Computer/internet/email
- Relaxing
- Socializing
- Intimate Relations
- Exercising
- Doing Nothing
- Waiting
- Nap/Resting

- Computer/Internet/Email
- Intimate Relations
- Exercising
- Other

Amount of Time Spent Doing Chores

4. The following is a list of common household tasks. Please indicate which chores you have spent any time during the PAST SEVEN DAYS (i.e., XX/YY until today, XX/YY).

Select all that apply [multi-select]

- Grocery Shopping
- Cooking meals
- Doing the dishes
- Loading and emptying the dishwasher
- Doing the laundry
- Ironing clothes
- Vacuuming
- Cleaning the bathroom
- Cleaning the kitchen
- Tidying up the home
- Repairing things around the home
- Caring for pets
- Taking out the trash
- Taking children to their activities and appointments
- Punishing the children
- Playing with the children
- Washing the car
- Yard-work (mowing the lawn, gardening)

For each chore separately:

For example:

You previously stated that, during the PAST SEVEN DAYS, you spent time [cleaning the bathroom].

How many minutes, approximately, did you spend [cleaning the bathroom] by yourself?

How many minutes, approximately, did you spend [cleaning the bathroom] with your partner?

How many minutes, approximately, did your partner spend [cleaning the bathroom]?

Amount of Time Spent Doing Chores (Overall)

5. In an average week, how many hours do you spend on household tasks without your partner? (A rough estimate is fine).
6. In an average week, how many hours does your partner spend on household tasks without you?
7. In an average week, how many hours do you and your partner spend together completing household tasks?

Dislike of chores replaced by time-saving vouchers

8. How much do you enjoy or dislike doing laundry?
1=very much dislike, 2=somewhat dislike, 3=neither dislike nor enjoy, 4=somewhat enjoy, 5=very much enjoy
9. How much do you enjoy or dislike preparing meals?
1=very much dislike, 2=somewhat dislike, 3=neither dislike nor enjoy, 4=somewhat enjoy, 5=very much enjoy

Household consumption

Conducted at both baseline and endline

Now I would like to ask you questions about how you spent money in the PAST 7 DAYS. These questions are about your household expenses, do not include business expenses.

Food consumption

1. Did your household consume this item in the past 7 days: Alcoholic drinks

- Spirits (y/n)
- Wine (y/n)
- Beer (y/n)
- Brews (y/n)
- Cider (y/n)

What was the total value of all alcoholic drinks consumed in the past 7 days _____ KSH

2. Did your household consume this item in the past 7 days: tobacco

- Cigarettes (y/n)
- Cigars (y/n)
- Tobacco (y/n)
- Snuff (y/n)
- Khatt or Miraa (y/n)

What was the total value of all tobacco consumed in the past 7 days _____ KSH

3. Did your household consume this item in the past 7 days: prepared foods

- Vendor food (y/n)
- Cafes or takeaways (y/n)
- Kiosks (y/n)
- Restaurants or hotels (y/n)

What was the total value of all prepared foods purchased in the last 7 days _____ KSH

Non-food consumption

4. Did you spend money (or goods) on this in the past 7 days? Airtime, internet, other phone expenses

What was the total value of airtime, internet, other phone used in the past 7 days _____ KSH

5. Did you spend money (or goods) on this in the past 7 days? Travel, transport, hotels

- 01 Petrol
- 02 Road tolls
- 03 Ferry tolls
- 04 Taxi
- 05 Parking charges
- 06 City bus
- 07 Matatu
- 08 Country bus
- 09 Boda/Piki
- 10 Train
- 11 Local flight
- 12 Hotel stays

What was the value of amount consumed in total (KSH) Travel, transport, hotels _____ KSH

6. Did you spend money (or goods) on this in the past 7 days? Lottery tickets, gambling

What was the value of amount consumed in total (KSH) Lottery tickets, gambling _____
KSH

7. Did you spend money (or goods) on this in the past 7 days? Clothing and shoes

What was the value of amount consumed in total (KSH) Clothing and shoes _____ KSH

8. Did you spend money (or goods) on this in the past 7 days? Recreation and entertainment

- 01 Cinema tickets
- 02 Videos
- 03 Music/CDs
- 04 Books/Magazines
- 05 Stadium tickets
- 06 Concert tickets
- 07 Park/Safari tickets

What was the value of amount consumed in total (KSH) Recreation and entertainment _____
KSH

9. Did you spend money (or goods) on this in the past 7 days? Personal items

- 01 Haircut
- 02 Aftershave, Body lotion, Toothpaste, razors, sanitary pads
- 03 Hair oil, Perfume, Petroleum jelly, Baby oil/powder, Cotton wool, Handkerchiefs
- 04 Cosmetics: lipstick, nail polish, eye-liner, etc.

What was the value of amount consumed in total (KSH) Personal items _____ KSH

10. Did you spend money (or goods) on this in the past 7 days? Household items

- 01 Soap
- 02 Combs
- 03 Toilet paper/tissue, etc.
- 04 Detergent
- 05 Dish washing paste
- 06 Broom/mop/duster
- 07 Disinfectant
- 08 Air freshener
- 09 Floor polish
- 10 Insecticide
- 11 Shoe polish
- 12 Match box
- 13 Candles
- 14 Laundry

What was the value of amount consumed in total (KSH) Household items _____ KSH

11. Did you spend money (or goods) on this in the past 7 days? Kerosene, firewood, charcoal

What was the value of amount consumed in total (KSH) Kerosene, firewood, charcoal _____ KSH

12. Did you spend money (or goods) on this in the past 7 days? Electricity

What was the value of amount consumed in total (KSH) Electricity _____ KSH

13. Did you spend money (or goods) on this in the past 7 days? Water

What was the value of amount consumed in total (KSH) Water _____ KSH

14. Did you spend money (or goods) on this in the past 7 days? House rent, mortgage

What was the value of amount consumed in total (KSH) House rent, mortgage _____ KSH

15. Did you spend money (or goods) on this in the past 7 days? Fixing home damage or improving or expanding

What was the value of amount consumed in total (KSH) Fixing home damage or improving or expanding _____ KSH

16. Did you spend money (or goods) on this in the past 7 days? Religious expenses or other ceremonies (excluding weddings and funerals)

What was the value of amount consumed in total (KSH) Religious expenses or other ceremonies (excluding weddings and funerals) _____ KSH

17. Did you spend money (or goods) on this in the past 7 days? Charitable donations

What was the value of amount consumed in total (KSH) Charitable donations _____ KSH

18. Did you spend money (or goods) on this in the past 7 days? Weddings

What was the value of amount consumed in total (KSH) Weddings _____ KSH

19. Did you spend money (or goods) on this in the past 7 days? Funerals

What was the value of amount consumed in total (KSH) Funerals _____ KSH

20. Did you spend money (or goods) on this in the past 7 days? School/college fees, uniforms, books, or other

What was the value of amount consumed in total (KSH) School/college fees, uniforms, books, or other _____ KSH

21. Did you spend money (or goods) on this in the past 7 days? Medical expenses, (including consultation fees, medicines, hospital costs, lab test costs, ambulance costs, and related transport)

What was the value of amount consumed in total (KSH) Medical expenses, (including consultation fees, medicines, hospital costs, lab test costs, ambulance costs, and related transport)
_____ KSH

22. Did you spend money (or goods) on this in the past 7 days? Household durables

- 01 Cutlery
- 02 Pots, pans
- 03 Blender
- 04 Light Bulb
- 05 Cups/glasses/mugs
- 06 Curtains
- 07 Carpets
- 08 Lamps
- 09 Fans
- 10 Plates
- 11 Vases
- 12 Mirrors
- 13 Chairs
- 14 Tables
- 15 Other furniture
- 16 Other durables

What was the value of amount consumed in total (KSH) Household durables _____ KSH

23. Did you spend any money on other expenses greater than KSH 1000?

[IF YES] Please specify this other expense

How much did you spend on these other expenses in total in the last 7 days?

Other spending proxies

24. How much money did people in your household spend yesterday?

25. How much money did people in your household spend in the last week?

26. How much cash does your household have "on hand" now?

27. What goods do you consume that nobody else in your household consumes (list)?

In the past 7 days, how much did you spend on these items? (total)

28. What goods does your husband/partner consume that nobody else in your household consumes (list)? In the past 7 days, how much was spent on these items? (total)

Subjective financial well-being

How well does this statement describe you or your situation?

1=does not describe me at all, 2=describes me very little, 3=describes me somewhat, 4=describes me very well, 5=describes me completely

1. I could handle a major unexpected expense
2. I am securing my financial future
3. Because of my money situation, I feel like I will never have the things I want in life (R)
4. I can enjoy life because of the way I'm managing my money
5. I am just getting by financially (R)
6. I am concerned that the money I have or will save won't last (R)

How often does this statement apply to you?

1=never, 2=rarely, 3=sometimes, 4=often, 5=always

7. Giving a gift for a wedding, birthday, or other occasion would put a strain on my finances for the month (R)
8. I have money left over at the end of the month
9. I am behind with my finances (R)
10. My finances control my life (R)

Objective financial well-being

Immediate financial concerns

1. In the PAST FOUR WEEKS, have you skipped meals or cut the size of meals? (yes/no)
2. In the PAST FOUR WEEKS, have other adults in your household skipped meals or cut the size of meals?
3. In the PAST FOUR WEEKS, have children in your household skipped meals or cut the size of meals? (yes/no)
4. In the PAST FOUR WEEKS, have any household members had to eat less preferred or less expensive foods? (yes/no)

[IF yes] How often?

5. In the PAST FOUR WEEKS, have any household members had borrow food or rely on help from a friend or relative to get enough food?

[IF yes] How often?

6. In the PAST FOUR WEEKS, have you gone to sleep hungry because there was not enough food? (yes/no)
7. In the PAST FOUR WEEKS, has anyone else in your household gone to sleep hungry because there was not enough food? (yes/no)
8. To what extent do you agree with the follow statements about your financial situation over the PAST FOUR WEEKS. Answer on a scale from: 1=strongly disagree, 5=strongly agree
 - a. Over the PAST FOUR WEEKS, I have been very worried about my financial situation
 - b. Over the PAST FOUR WEEKS, I have been very worried about having enough money to make ends meet
 - c. Over the PAST FOUR WEEKS, I have been very worried about not being able to find money in case I really need it

Housing and Assets (baseline only)

1. Which of the following assets do you own? [indicate ownership status for each asset]

- Personally own
- Common property / owned by someone in the household
- Don't own

Inherited or given land

Land you bought

Livestock

Car, van, bus, or truck

Motorcycle or other motorized vehicle or machinery

Refrigerator

TV

TV subscription

Working basic phone

Working smart phone (internet access)

2. From all of the sources of income that you just mentioned, how much income have you earned in the last 6 months from [insert date 6 months ago] to date? If you do know the exact amount, please provide your best guess. _____ KSH

3. How much money (from all sources of income) do you expect to earn in the next 6 month, from today until [enter date 6 months from today]? _____ KSH

4. Is your income seasonal?

- Yes
- Partly
- No

[If YES or PARTLY] what % of your total overall income is seasonal? (0-100%)

5. If you lost your main source of income, how long could you continue to cover your living expenses and the living expenses of your dependents without borrowing any money?

- Less than a week
- At least a week, but not one month
- At least one month, but not three months
- At least three months, but not six months
- More than six months
- Don't know

- Refused

6. Approximately, how much money do you have saved in total? (Please take the sum of all money you have saved in bank accounts, cash etc.) _____ shillings [open-ended]
[OR provide ranges]

- Less than 100 KSH
- 100 - 500 KSH
- 500 - 1000 KSH
- 1000 - 5000 KSH
- 5000 - 10,000 KSH
- 10,000 - 50,000 KSH
- 50,000 - 100,000 KSH
- More than 100,000 KSH

7. How often do you save?

- Never
- Less than once per year
- About once every 6 months
- About once every 3 months
- About once per month
- Once a week or more

Demographics (baseline only)

1. What is the respondent's gender?
 - Male
 - Female
2. What year were you born?
3. Where were you born (village)?
4. What is your marital status
5. What is your relationship to the head of the household
 - I am the head of the household
 - Spouse
 - Son/daughter
 - Father/mother
 - Grandchild
 - Other relative
 - Other (specify)
6. What is the highest level of formal education that you have completed?
7. Do you have children?
 - Yes
 - No
8. How many children do you have?
9. In total, how many people live in your house, including you?
10. How many people depend on entirely you for your support?

Employment & enterprise (baseline only)

1. What is your primary job? [open response, FO to code using employment codes]
2. How are you paid for this job?
 - Salary
 - Hourly or daily pay
 - Performance-based (e.g. sales commission)
 - Other
3. How often are you paid in your primary job?
 - Daily
 - Weekly
 - Once every two weeks
 - Once per month
 - Less than once per month
4. How many hours per week do you work in your main job (on average)?
5. Do you have any other sources of income?
[if YES] Please describe [open-response, FO to code]
[For each job listed] How are you paid for this job? How many hours per week do you work in this job?
6. How predictable is your income?
7. If you had more available free time, could you earn more money at your primary job?
(yes/no)
8. If you had more available free time, could you earn money in any other ways? (yes/no)

[If YES] Please describe how you could earn additional money
9. Do you or does anyone in your household own and operate a business? (yes/no)
[If YES]
What is your share in this enterprise?

What is the nature of this enterprise? [open-response, FO to code using enterprise codes]

What is the total number of employees in this enterprise (household and non-household members)? How many employees are not household members?

How many of these employees are paid? How many are unpaid?

If you had more available free time, could you spend it working on this enterprise?
(yes/no)

Financial decision-making (baseline only)

1. Who makes the main decisions about how money is spent in your household?
 - Myself
 - Myself with my spouse
 - Myself with someone else
 - Spouse
 - Parents
 - Children
 - Brothers/Sisters
 - Other relatives
 - Non-relatives
 - All adults
 - N/A

Budgeting

2. People use a variety of methods to manage their finances. Do you use each of the following:
 - Follow a budget or spending plan (yes/no)
 - Track spending (yes/no)
 - Review paper bank statements and/or bills (yes/no)
 - Plan for periodic expenses (e.g. school fees, medical expenses) (yes/no)
 - Other (please specify)
3. Do you use each of the following to budget or track your spending?
 - Digital tracking via my bank or SMS
 - Paper-based system (e.g. a notebook)
 - Other (please specify)

Savings and loans

1. Which of the following savings accounts do you have?
 - Formal bank account
 - SACCO
 - Chama
 - M-Pesa
 - M-shwari
 - Other
2. What are all the reasons that you save?

3. Have you ever taken a loan?

[If YES] From which of the following sources have you taken a loan?

- Formal bank account
- SACCO
- Chama
- M-Pesa
- M-shwari
- Other

[If YES] How often do you take loans?

[If YES] Do you currently have any outstanding unpaid debt? (yes/no)

Exploratory Measures

Time preferences⁶⁵

The next set of questions ask about preferences between money today and money in the future. You will be presented with multiple pairs of alternatives. For each pair, check the alternative that you prefer. There is no right or wrong answer, so simply tell us your true preference.

Imagine you could choose between **receiving** KSH 200 immediately, or another amount in **1 week** from now. Please indicate which option you would choose in each case.

- | | |
|---|---|
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 190 in 1 week</i> |
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 200 in 1 week</i> |
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 210 in 1 week</i> |
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 225 in 1 week</i> |
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 250 in 1 week</i> |
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 275 in 1 week</i> |
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 300 in 1 week</i> |
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 350 in 1 week</i> |
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 400 in 1 week</i> |
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 500 in 1 week</i> |
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 700 in 1 week</i> |
| <input type="checkbox"/> <i>Receive KSH 200 today</i> | <input type="checkbox"/> <i>Receive KSH 1,000 in 1 week</i> |

Imagine you could choose between **receiving** KSH 2,000 immediately, or another amount in **12 months** from now. Please indicate which option you would choose in each case.

- | | |
|---|---|
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 1,900 in 12 months</i> |
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 2,000 in 12 months</i> |
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 2,100 in 12 months</i> |
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 2,200 in 12 months</i> |
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 2,500 in 12 months</i> |
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 3,000 in 12 months</i> |
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 4,000 in 12 months</i> |
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 5,000 in 12 months</i> |
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 7,500 in 12 months</i> |
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 10,000 in 12 months</i> |
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 15,000 in 12 months</i> |
| <input type="checkbox"/> <i>Receive KSH 2,000 today</i> | <input type="checkbox"/> <i>Receive KSH 30,000 in 12 months</i> |

Subjective length of time⁶⁶

In this task, you will be asked to indicate your subjective feeling of duration between today and a day in the future. Please read the instructions carefully and indicate your responses.

1. Imagine a day 3 months into the future. Please use the slider below to indicate how long you consider the duration between today and a day 3 months later. How long do you consider the duration between today and a day 3 months later?
2. Imagine a day 12 months into the future. Please place a mark on the line indicating how long you consider the duration between today and a day 12 months later. How long do you consider the duration between today and a day 12 months later?

Optimism – Life Orientation Test (Revised)⁶⁷

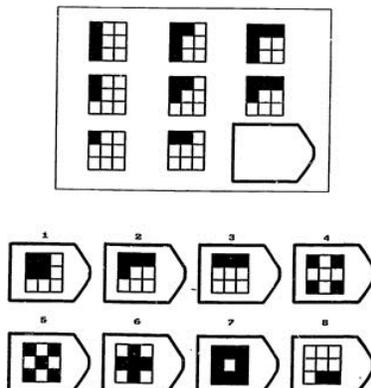
I will now read out some statements about how you may feel. In each case, you should tell me how often you feel this way. Answer using the following scale: 1=all the time, 2=often, 3=sometimes, 4=rarely, and 5=never

1. In uncertain times, I expect the best
2. If something can go wrong for me, it will
3. I'm optimistic about my future
4. I expect things to go my way
5. I count on good things happening to me
6. I expect more good things to happen to me than bad

Cognitive functioning tasks

Raven's Progressive Matrices (conducted using z-tree)⁶⁸

Example item:

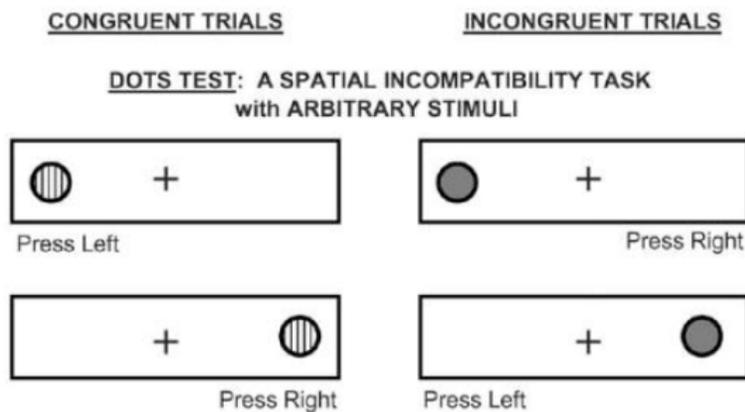


Numerical Stroop Task (conducted using z-tree)⁶⁹

Example item:

Congruent pair	Incongruent pair	Neutral pair – Numerical task	Neutral pair – Physical task
3 5	5 3	3 5	3 3

Dots-mixed task (conducted using z-tree)⁷⁰



Unusual events during intervention period (endline only)

Please tell us if you have experienced any of the following events in the PAST FOUR WEEKS?

1. Change in job, form of work, or schooling
 - Yes. If yes, please describe.
 - No
2. Did you experience another type of stressful life event in the PAST FOUR WEEKS?
 - Yes. If yes, please describe.
 - No
3. Who is responsible for the day-to-day decision about money in your household?
 - You
 - You and your partner – *only include if participant indicated married*

- Someone else. If “someone else” what is your relation to this person?

Self-Investment Behavior Measure (Endline only)

For this measure, we will offer participants the option to attend a job skills class such as business accounting or financial literacy training offered through Kibera Town Centre.

We would measure 1) sign-up and 2) follow-through rates.

Reservation Wage Measure (Endline only)

Note: If the vouchers that reduce the burden of unpaid labor, free up more time, women should be more willing to work. We will measure this via the labor provision task below. This task will come at the very end of the endline measure

Materials needed for BDM protocol:

- Large container filled with rice and lentils (mixed) marked “Rice and Lentils”
- Cup marked “Rice”
- Cup marked “Lentils”
- Opaque container marked “Wage Amounts” filled with tokens. The bag contains 8 tokens, one with each of the following wages: 25 KSH per hour, 50 KSH per hour, 75 KSH per hour, 100 KSH per hour, 150 KSH per hour, 200 KSH per hour, 300 KSH per hour, 500 KSH per hour

[FO read aloud]:

We would now like to offer you the opportunity to complete a one hour job in return for additional pay.

Job Description:

The job involves separating rice and lentils from this larger container [Note to FO: show respondent larger container marked “rice and lentils”] into two smaller containers [Note to FO: show respondent two smaller cups marked “rice” and “lentils”].

Do you have any questions about the job?

I will now ask you a series of questions about how much money you would need to be paid to complete this one hour job. I will ask you whether you would be willing to complete this job for different amounts of money. You will then draw a token that determines which of these amount you will receive in return for completing the job.

[Note to FO: show respondent the container of tokens with different wage amounts marked on each token]

If you say “no” to that wage and you draw it, then you will not be given a contract to complete the job, and you will not have a chance to change your mind. If you say “yes” to that wage and you draw it, you will be expected to work and be paid this amount for the one hour job.

[Note to FO: for each of the following wages, confirm twice and describe the implications of saying yes/no]

If you pick 25 KSH, would you accept the job? Yes / No

If you pick 50 KSH, would you accept the job? Yes / No

If you pick 75 KSH, would you accept the job? Yes / No

If you pick 100 KSH, would you accept the job? Yes / No

If you pick 150 KSH, would you accept the job? Yes / No

If you pick 200 KSH, would you accept the job? Yes / No

If you pick 300 KSH, would you accept the job? Yes / No

If you pick 500 KSH, would you accept the job? Yes / No

[Note to FO: ask respondent to draw a token from the container]

What wage amount did you draw?

[FO to complete]:

Did the respondent say that he/she would accept a contract at that wage? Yes / No

[if yes, read aloud]: You said that you would accept a wage of [say wage drawn], so we will offer you a labor contract at that wage.

Thank you for completing our study!

Do you have any questions for me?

Minimizing Spillover Effects Between Conditions

Prior research has documented the existence of negative spillover effects in UCT experiments, such that the observed positive benefits are actually negative impacts in the control condition.^{71,72,73} We have therefore taken precautions to minimize the risk of negative spillovers.

First, we are running the study through an established research centre. Busara runs multiple studies in Kibera at any given time, many of which involve the collection of survey data as well as cash and in-kind compensation. Therefore, even if a participant knows other people in the study, there will be no way to distinguish these participants from those in any of Busara's other ongoing studies. As a result, it is very unlikely that our participants will directly compare themselves against other participants in our specific study who are in another condition.

Second, we have taken precautions to ensure that participants do not interact with each other in our study. During the intervention period, only participants who receive time-saving vouchers will visit Kibera Town Centre. In contrast, participants assigned to the UCT and pure control conditions will only visit KTC to complete the baseline and endline surveys. During the baseline and endline surveys, we will randomize participants at the session level. For example, on Monday morning, only participants in the control condition will complete baseline or endline surveys; participants in the time-saving and UCTs conditions will be assigned to other sessions. Thus, any interactions will be limited to participants assigned to the same condition.

Finally, we will measure spillovers through a funnel-debriefing that will occur after the final endline. In this debriefing, we will ask three questions to identify participants who may have experienced spillovers. First, we will ask participants whether they know anybody participating in this study. Second, we will ask the name of this person to validate whether they were in fact another participant in our study. Third, we will ask an open-ended question about what the other participant received as compensation in this study. We will define 'spillover participants' as those who correctly identify knowing another participant who received a different form of compensation. We will re-run each of our key analyses controlling for an indicator variable of potential spillovers

Supplementary Results

Pilot Study Results

To design and prepare for the longitudinal field experiment, five pilot studies were conducted.

Pilot Study 1 (July 2017): Survey on time-use and outsourcing in Kibera

Pilot Study 2 (June 2018): Survey to develop time-saving vouchers in Kibera

Pilot Study 3 (October 2018): Survey of policymakers at the Harvard Kennedy School

Pilot Study 4 (July 2018): Pilot experiment testing time-saving voucher logistics

Pilot Study 5 (October 2018): Pilot of outcome measures adapted for Kibera context

All pilot materials containing all measures and all raw pilot data is available on the Open Science Framework: https://osf.io/pkyt9/?view_only=a17fdb3f43eb4fddaaf05e812234948d

Below we outline the key findings from the pilot studies that were cited in the main text, including a brief description of methods as well as where materials and data can be located on OSF.

Pg. 4: “In our pilot data, women living in Kibera reported “never” paying for laundry services, and 82.4% reported “never” paying for prepared meals from small local vendors.”

- Pilot Study 1, $N=32$, recruited from Busara’s participant pool in Kibera.
- Participants completed a 10-15min survey conducted over the phone.
- Survey materials available on OSF, *Pilot Study 1 (July 2017) – survey on time-use and outsourcing in Kibera*
- Raw data available on OSF, 20190411 Pilot Data - Time Poverty (sheet: Pilot Study 1)

Pg. 4-5: “In an initial pilot study, we asked thirty current and aspiring policy makers from the Harvard Kennedy School of Public Policy how they would allocate 2100 KSH of aid to improve the welfare of working women living in Kibera. Only 6% of respondents spontaneously reported that the 2100 KSH should be used to save these women time. When we explicitly provided respondents with the choice between three aid programs (an unconditional cash transfer program, an in-kind goods program, or a time-saving program), only four respondents (13%) selected the time-saving program; 87% chose cash.”

- Pilot Study 3, $N=30$, recruited students at Harvard Kennedy School of Public Policy
- Participants completed a 10min survey on their opinions about the effectiveness and value of different economic aid programs.
- Survey materials available on OSF, *Pilot Study 3 (October 2018) – survey of policymakers at HKS*
- Raw data available on OSF, 20190411 Pilot Data - Time Poverty (sheet: Pilot Study 3)

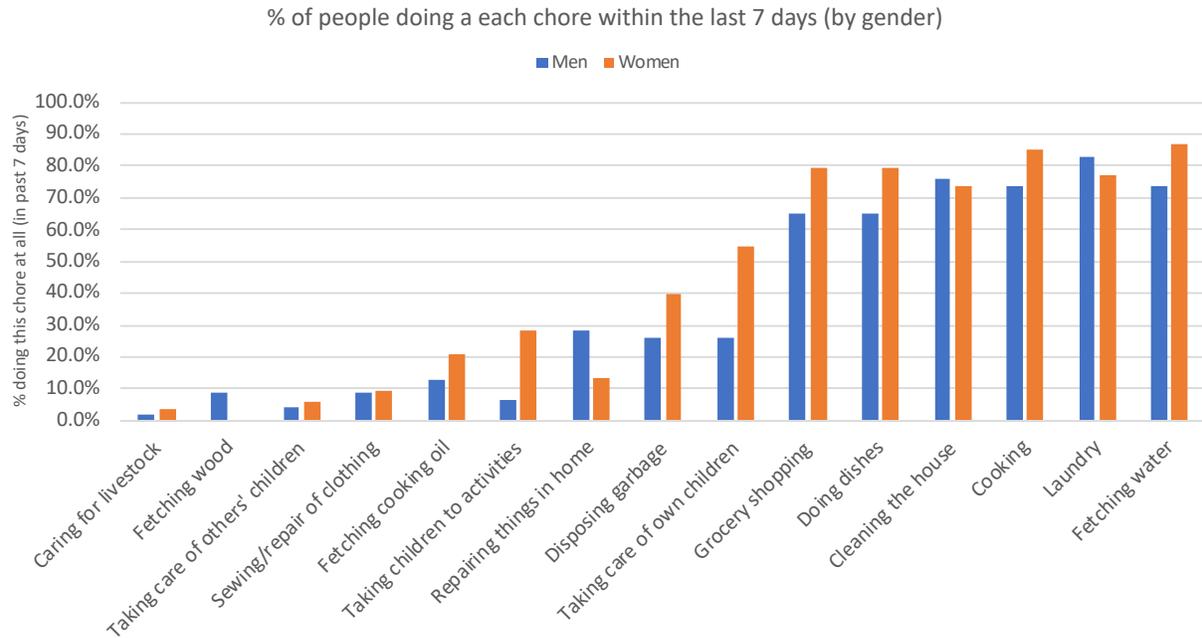
Pg. 10: “To develop the time-saving vouchers, we selected services likely to have the greatest benefits for our target population. We conducted a pilot study to identify local services that met the following criteria for working women in Kibera: the services 1) saved a significant amount of time, 2) replaced chores that are unpleasant, and 3) replaced chores that did not involve significant social interaction (i.e., women typically engaged in these chores alone).”

- Pilot Study 2, $N=100$ recruited from Busara participant pool in Kibera
- Participants completed 20min phone survey conducted over the phone.
- Survey materials available on OSF, *Pilot Study 2 (June 2018): survey to develop time-saving vouchers*
- Raw data available on OSF, 20190411 Pilot Data - Time Poverty (sheet: Pilot Study 2)
- See Supplementary Figures 1-5

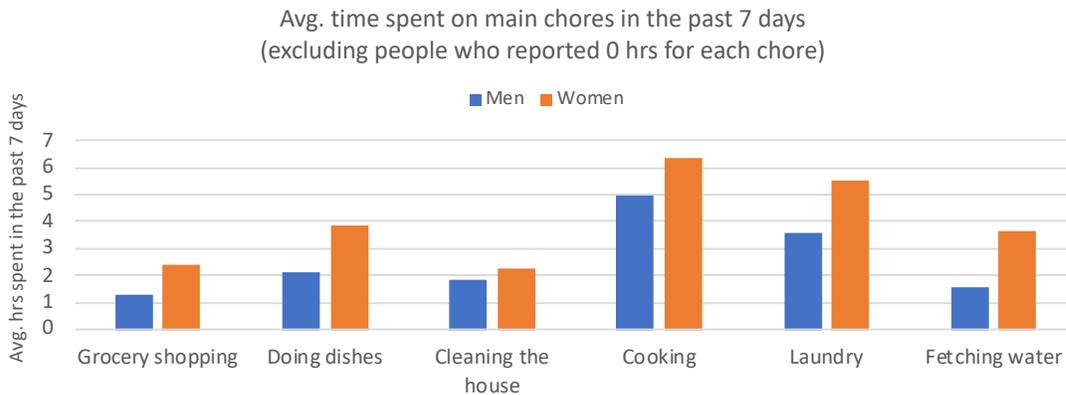
Pg. 10: “The cost to provide each of these time-saving services is 500 KSH per week. Based on our pilot data, 500 KSH worth of these services eliminates a significant amount of unpaid labor among our target population of interest (*3-7 hours per week on average*).”

- Pilot Study 2, $N=100$ recruited from Busara participant pool in Kibera
- Participants completed 20min phone survey conducted over the phone.
- Survey materials available on OSF, *Pilot Study 2 (June 2018): survey to develop time-saving vouchers*
- Raw data available on OSF, 20190411 Pilot Data - Time Poverty (sheet: Pilot Study 2)
- See Supplementary Figure 6

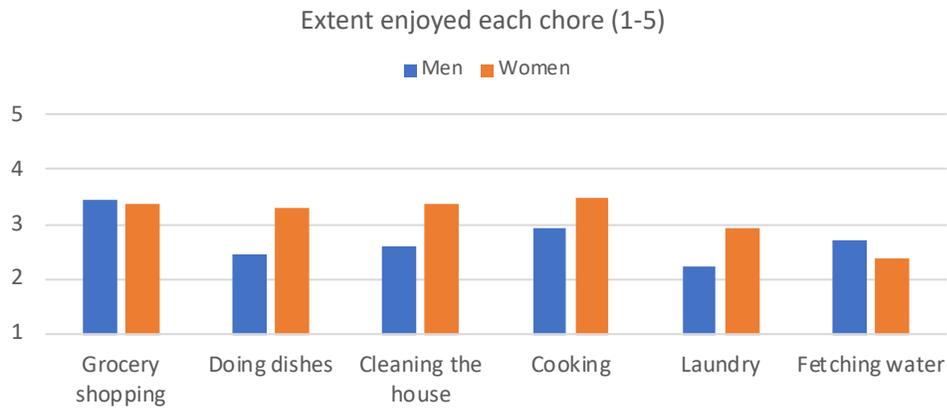
Supplementary Figures



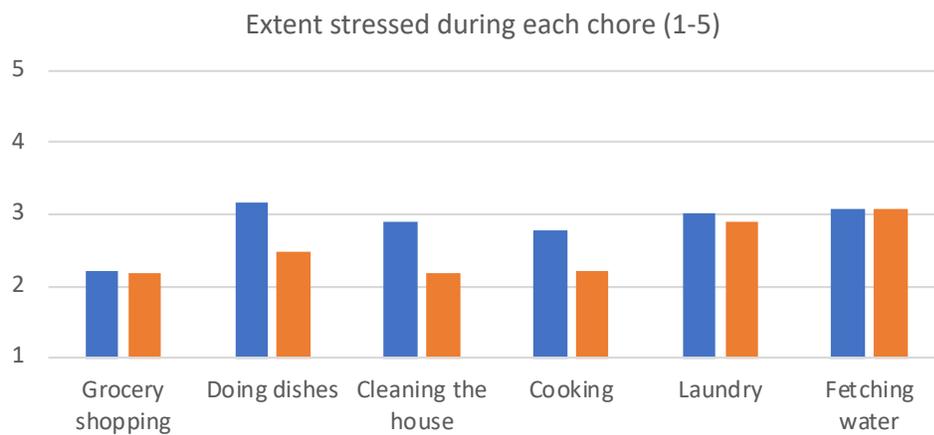
Supplementary Figure 1. Data from Pilot Study 2 (phone survey, $N=100$). Percentage of recipients ($N=100$) spending any time on each chore within the last 7 days.



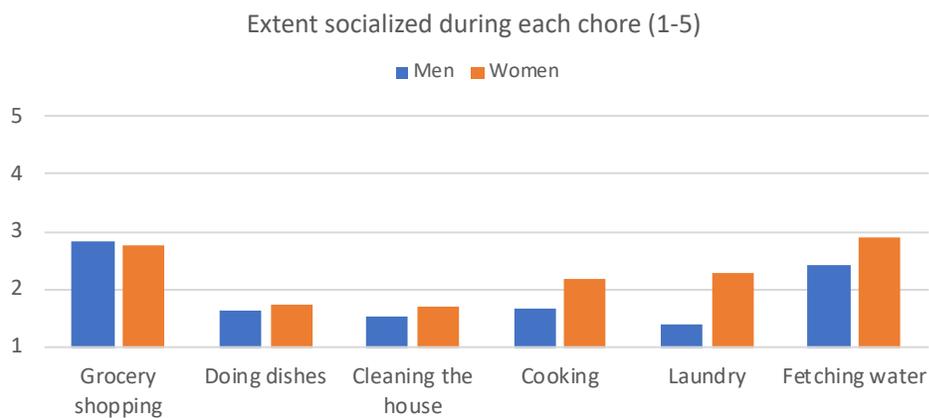
Supplementary Figure 2. Data from Pilot Study 2 (phone survey, $N=100$). For each participant who mentioned engaging in a given chore with the past 7 days, they were asked how much time they spent on that chore. This figure displays the avg. amount of time spent on each chore (excluding childcare).



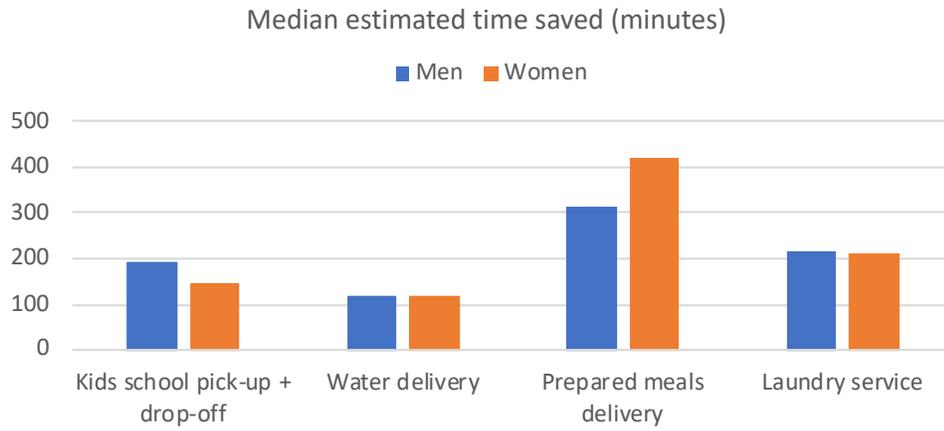
Supplementary Figure 3. Data from Pilot Study 2 (phone survey, $N=100$). Participants rated the extent to which they enjoyed each of these chores.



Supplementary Figure 4. Data from Pilot Study 2 (phone survey, $N=100$).



Supplementary Figure 5. Data from Pilot Study 2 (phone survey, $N=100$).



Supplementary Figure 6. Data from Pilot Study 2 (phone survey, $N=100$) Median estimates for the amount of time that would be saved as a result of receiving each voucher. Participants make an estimate for each of the 4 vouchers described.

Supplemental References

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