Behavioral Effects of Priming Aid Dependence: Pre-Analysis Plan*

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Abstract

While economists, policymakers, and other researchers have studied the effects of foreign aid on government processes and macroeconomic variables, few have explored the individual-level psychological effects of living in a country that is heavily dependent on foreign assistance. In this study, we randomly assigned residents of informal settlements in Kenya to one of three priming treatments in a laboratory setting. The treatments either primed the belief that Kenya is dependent on foreign aid, that Kenya is self-sufficient, or neither belief. The primes consisted of a screensavers, a short video presentation, and a writing task. After the primes, we measured their effects on honesty, effort provision, and a number of psychological variables. This document outlines the econometric methods we will use to assess the effect of the primes on these outcome variables.

1 Introduction

In the present study, we seek to shed light on the behavioral and psychological consequences of dependence on foreign development aid, using a priming study in a laborotary setting in Kenya. We recruited participants from the Nairobi informal settlements and exposed them to one of three primes: a prime for the belief that Kenya is dependent on foreign aid; that it is self-sufficient; or neither belief. We then measured effort provision, honesty, situational self-esteem, feelings of national pride, perceived locus of control, implicit and explicit attitudes towards donors (international NGOs and the United States), opinions on domestic and foreign aid, and confidence in domestic and international institutions. This document presents a pre-analysis plan for the econometric analysis of the data.

2 Experimental Design and Procedures

2.1 Manipulations

Each participant was randomized into one of three conditions: *aid dependency*, *self-sufficiency*, or *control*. In each of these conditions, participants were exposed to a prime consisting of three components: computer screensaver images, short video presentations, and a writing task in which participants are asked to summarize the main point of the videos.

In the aid dependency condition, the prime consisted of the following components. First, as the experimenter read aloud instructions for the session, participants were shown the logos of thirteen different aid organizations on their screens as a screensaver. The organizations included both international and national NGOs, and all images were vetted for familiarity before the study. Later in the study, the screensaver was re-administered for 30 seconds to refresh their priming effect (see below for order of tasks).

After 90 seconds of exposure to the screensavers, participants were shown a video presentation lasting two minutes in which a speaker presented the argument that Kenya is dependent on aid. The argument drew on official facts and statistics about the Kenyan economy. The style of the video was modeled on standard Kenyan television news stories with which all participants were likely familiar. The screen revealed three summary bullet points in English as a male voice-over provided detailed information in Swahili.

Finally, after viewing the video, participants were asked to write the main points in their own words on a piece of paper provided.

The primes in the self-sufficiency and control conditions were identical in structure, but differed in content as follows. First, the screensaver in the self-sufficiency condition showed the logos of eleven well-known Kenyan companies instead of international NGOs. In the control condition, participants were shown a blank screen instead of a screensaver. Second, in the self-sufficiency condition, the

video presented the argument that Kenya is self-sufficient, again drawing on official facts and statistics about the Kenyan economy. In the control condition, the video presented information about ferryboats. The videos were matched in terms of vocabulary, speaker characteristics, length, and overall style. The writing tasks in these two conditions again asked participants to summarize the arguments presented in the videos.

Prior to the main study, we conducted a pilot manipulation check with 40 participants that showed significant differences in perceptions of Kenya's dependence on foreign aid between the aid dependency and self-sufficiency conditions ($p = 0.001$, $d = 1.17$). This result suggests that our primes were effective in influencing perceptions of Kenya's dependence on foreign aid.

2.2 Sampling and power

The study was conducted at the Busara Center for Behavioral Economics (Busara) in Nairobi, Kenya, a facility specially designed for experimental economics and psychology studies. Busara maintains an active participant pool of more than 12,000 Nairobi residents. For the present study, 449 participants who had previously signed up to be part of the Busara participant pool were recruited from Kawangware and Kibera, two informal settlements in Nairobi. Participants were recruited using phone calls. In the recruitment phone call, participants were told that they were invited to participate in a study being conducted by behavioral economics researchers. They were informed that they would be paid KES 300 for their participation and have the opportunity to earn more during the study. To minimize demand effects, they were also told clearly that no government or outside organization was sponsoring the study.

The sample included both males and female university students over eighteen years of age. Participants had previously been vetted to ensure that they were able to comprehend both written and spoken English and Swahili.

2.2.1 Power Calculations

Each of the 467 participants was randomly assigned to one of the three experimental conditions , resulting in 162 participants in the aid dependency condition, 153 in the self-sufficiency condition, and 152 in the control condition. A power analysis shows that these numbers result in 93.6% power to detect a treatment effect of 0.4 standard deviations, and have 80% power to detect 0.322 SD effects.

2.3 Outcome measures

2.3.1 Manipulation checks

ST-IAT Manipulation Check As a manipulation check for the five-blcok NGO/USA ST-IAT described above, we administered a Snake-Spider-Food ST-IAT drawn from Nunn et al. (2015) at the

very beginning of each experimental session. We reasoned that all participants should have positive associations with food, negative associations with spiders, and even stronger negative associations with snakes, as there are more poisonous snakes in the region than spiders. If this ST-IAT successfully measured these associations, we can be confident that it is an effective tool for measuring other implicit attitudes. The ST-IAT is detailed in Section 2.3.3.

Priming Manipulation Check To assess whether the primes were successful in shifting beliefs about Kenya's dependence on foreign aid, we asked the following question:

- In order to have a good life, do Kenyans rely on foreign aid very much, a little bit, or not at all?

Responses to this question will be z-scored before analysis.

2.3.2 Primary outcome variables

Effort provision We employed a real-effort counting task in which participants were told to count the number of 0s in a series of randomly generated grids of 1s and 0s, consisting of seven rows and five columns. The task was designed to be tedious, but it does not require prior knowledge or allow for learning, making it an optimal and simple way to measure willingness to incur real-effort costs (Abeler et al., 2011). Participants entered their answers on a number pad on the touch screen and then pressed a green OK button to move on to the next grid. There was also a CLEAR button to be used to correct input errors.

We implemented this task in two stages. The first was a two minute practice round that allows participants to familiarize themselves with the instructions and format of the task. Next, participants were given six minutes to complete real task that is identical to the practice round, except that participants were now told that they will be paid KES 5 for each correct answer. Thus, this task provides an incentivized measure of effort provision. The variable we will analyze is the total number of correct entries in this task.

Honesty To measure honesty, we employed a coin flip honesty game (Houser et al., 2012; Bucciol and Piovesan, 2011; Greene and Paxton, 2009). Each participant was instructed to designate one side of a fair coin as the "winning" side, but to keep this decision private. Participants were then told that they will be paid KES 5 for each coin flip resulting in that outcome. Participants then flipped a coin provided to them 30 times and indicate on the computer whether they won or lost for each flip. The experimenters emphasized that the input supplied by the participants is not monitored. The task was divided into three stages of ten flips, and participants are free to change any of their answers within each stage. At the end of the task, earnings were displayed on each participant's screen.

We derive three outcome measures from this task:

1. For each individual, the proportion of reported 'wins' out of 30

2. An individual-level measure based on the binomial probability that the reported number of "wins" actually occurred

3. A group-level measure that calculates the binomial probability that the observed number of "wins" in the populations actually occurred following Houser et al. (2012). This measure is our primary measure of interest in the honesty task.

State self-esteem Our state self-esteem measures were drawn from Heatherton and Polivy (1991) State Self- Esteem Scale (SSES). The SSES is a situational self-esteem measure that is sensitive enough to measure temporary effects of experimental manipulations. The questions target social, performance-based, and appearance-based self-esteem. We omitted three questions about body image included in the original and made a number of minor modifications to other questions to appropriately adjust the scale for social context.

The primary outcome measure for this scale is the first factor resulting from a factor analysis on the responses to each question in the SSES. As a secondary outcome measure, we will also compute a weighted-average index of the responses following Anderson (2008).

Locus of control Participants were asked the degree to which they agree with the statement "Do you think that everything in life is determined by fate or that people shape their fate themselves?" on a scale of 1-5. The outcome variable will be the z-score of the responses to this question.

2.3.3 Secondary outcome variables

Implicit attitudes towards NGOs and the United States We employed a single-target Implicit Association Test (ST-IAT) to measure implicit attitudes towards NGOs and the United States. The ST-IAT is a computer-based sorting task that uses response time to measure unconscious positive and negative associations with a target concept (Greenwald et al., 2003). The specific design we use was adapted from Nunn et al. (2015). In each block of the ST-IAT, participants sorted three types of objects to the left- and right-hand sides of the screen according to specific instructions: happy images, sad images, and images associated with the target (NGO or USA). The NGO images were logos of Kenyan domestic brands that were used in the self-sufficiency screensaver prime. The USA images include several pictures of the American flag. All of the images were vetted for comprehension with the sample population.

Throughout the task, participants sorted the happy images to one side of the screen, and unhappy images to the other side. "Sorting" an image was achieved by touching the corresponding side of

the screen. The target images also had to be sorted to particular sides of the screen, and crucially, in different blocks of the task this side was either the "happy" or the "sad" side. The basic premise of the ST-IAT is that participants will more quickly sort target images to the "happy" or "sad" side of the screen depending on their implicit association of the target with either positive or negative valence. For instance, a participant with positive implicit attitudes to target images would be predicted to be faster to sort these images to the "happy" side of the screen.

In total, our NGO and USA ST-IATs had five blocks. The first was a practice block in which participants sorted happy and sad images only. Each of the next four blocks contained happy and sad images and *either* NGO or USA images. In one of these blocks, participants sorted NGO images to the "happy" side of the screen; in another, they sorted NGO images to the "sad" side of the screen; and analogously for the third and fourth blocks and USA images. To prevent order effects, we randomized the order of the blocks. To ensure comprehension and diligence, participants repeated any blocks for which they had lower than a 75% accuracy rate.

To create an outcome measure, we will calculate two D-scores (US attitudes and NGO attitudes) for each individual, as follows:

$$\text{D-Score} = [\text{Mean}\,(latency^-) - \text{Mean}\,(latency^+)]/\text{SD}^{both}$$

Here, $latency^-$ is the reaction time when associating the concept of interest (e.g., pictures associated with the USA or NGOs) with the "sad" side of the screen, and $latency^+$ is the reaction time when associating the concept of interest with the "happy" side of the screen. Latency (response time) is recorded in milliseconds, and shorter latencies indicate a stronger implicit association. SD^{both} is the standard deviation calculated across both latencies. A higher D-score represents a more favorable implicit attitude towards a target. In our analysis, we will not use data from the practice blocks or blocks in which participants answered less than 75% correctly. We will winsorize latency to 3000 milliseconds and account for incorrect responses by replacing latency with the sum of the block mean latency and the standard deviation latency of correct responses.

Explicit attitudes towards domestic aid

- In order to have a good life, do Kenyans rely on the government very much, a little bit, or not at all?

- In order to have a good life, do Kenyans rely on the government too much, the right amount, or too little?

- In 2012, the Kenyan government spent KES 33 Billion in Kenya to help the poor, the elderly, and youth. Do you think this amount is too low, about right, or too high?

- How important is it to live in a country where the government provides for the poor? (1 = Not important, 2 = Somewhat important, 3 = Very important)

- The government should take more responsibility to ensure that everyone is provided for. How much do you agree with this statement? (1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree)

These questions will be z-scored and analyzed individually and not combined into an index.

Explicit attitudes towards international aid

- In order to have a good life, do Kenyans rely on foreign aid too much, the right amount, or too little?

- In 2012, foreign charitable and humanitarian organizations spent KES 37 Billion in Kenya to help the poor, the elderly, and youth. Do you think this amount is too low, about right, or too high?

- How important is it to live in a country where foreign charitable or humanitarian organizations provide for the poor? (1 = Not important, 2 = Somewhat important, 3 = Very important)

- Foreign charitable/humanitarian organizations should take more responsibility to ensure that everyone is provided for. How much do you agree with this statement? (1 = Strongly disagree, 2 = Disagree, 3 = Agree, 4 = Strongly agree)

These questions will be z-scored and analyzed individually and not combined into an index.

Confidence in domestic institutions   To assess the degree to which individuals have confidence in government institutions, we ask the following questions. The response scale is 1 = A great deal, 2 = Quite a lot, 3 = Not very much, and 4 = None at all.

- How much confidence do you have in the GOVERNMENT?

- How much confidence do you have in POLITICAL PARTIES?

- How much confidence do you have in PARLIAMENT?

- How much confidence do you have in the CIVIL SERVICE?

- How much confidence do you have in the POLICE?

- How much confidence do you have in the COURTS?

The primary outcome measure for this group of questions is the first factor resulting from a factor analysis on the responses to each question. As a secondary outcome measure, we will also compute a weighted-average index of the responses following Anderson (2008).

Confidence in international institutions   To assess the degree to which individuals have confidence in government institutions, we ask the following questions. The response scale is 1 = A great deal, 2 = Quite a lot, 3 = Not very much, and 4 = None at all.

- How much confidence do you have in ENVIRONMENTAL ORGANIZATIONS?

- How much confidence do you have in FOREIGN CHARITABLE / HUMANITARIAN OR-GANIZATIONS?

- How much confidence do you have in the UNITED NATIONS?

- How much confidence do you have in the WORLD BANK?

- How much confidence do you have in the RED CROSS?

The primary outcome measure for this group of questions is the first factor resulting from a factor analysis on the responses to each question. As a secondary outcome measure, we will also compute a weighted-average index of the responses following Anderson (2008).

Demographics Participants were asked their age, gender, education level, and if they had ever received help from an aid organization in the past.

2.4   Experimental procedure

For each session, participants attended lab of the Busara Center for Behavioral Economics in Nairobi, Kenya, for experimental sessions lasting approximately 2.5 hours. There were 25 sessions in total, each with between 9 and 25 participants. Sessions were administered by two female Kenyan research assistants, who spoke English and Swahili fluently and were trained in helping participants with comprehension. The experiment was conducted primarily in English, though the video voiceovers were presented in Swahili, and the experimenters often translated the instructions and questionnaires into Swahili as was necessary. Participants were randomly assigned to one of 25 workstations equipped with HP TouchSmart 310 desktop computers with touchscreens running Windows 7. Each workstation had partitions on three sides, so that participants were unable to see or speak with the other participants. Participants used the touch screen to mitigate effects of individual differences in experiences using a mouse and keyboard. With the exception of the IATs, all instruments were implemented using z-Tree software (Fischbacher, 2007). The Implicit Association Tasks were implemented using OpenSesame software (Mathôt et al., 2012). Participants were randomly assigned within each session to one of the three experimental conditions described above.

The order of each session was as follows:

1. Snake-Spider-Food ST-IAT

2. Screensaver prime (90 seconds)

3. Video prime

4. Writing exercise

5. Real effort task practice round (2 minutes)

6. Real effort task (6 minutes)

7. Coin-flip honesty task

8. Screen saver prime (30 seconds)

9. Self-esteem questionnaire

10. Manipulation check questionnaire

11. NGO / USA ST-IAT

12. Survey consisting of questions on locus of control, and attitudes on aid, dependency, and domestic and international institutions

13. Demographics questionnaire

At the conclusion of the final questionnaire, the participants' screens displayed earnings from the effort task, the honesty task, and the total for the entire session. Participants were then debriefed and paid KSH 300 in cash. The remaining balance of the earnings from the study was delivered through the M-Pesa mobile money service later the same day.

3   Econometric Specifications

3.1   Previous analysis

The data from the first 266 participants of this experiment was analyzed before completion of this pre-analysis plan in the context of an undergraduate thesis. However, the final number of participants was determined before this analysis took place, and was adhered to. Both the basic econometric specification and that for heterogeneous treatment effects described here are identical to those used in the previous analysis, and were determined prior to the previous analysis.

3.2 Basic specification

Our basic specification for assessing the effect of the primes on our outcome variables is as follows:

$$y_i = \beta_0 + \beta_1 T_{D,i} + \beta_2 T_{S,i} + \alpha_s + \varepsilon_i \tag{1}$$

Here, y_i is the outcome of interest measured at the level of the individual respondent i. $T_{D,i}$ is an indicator taking a value of 1 if individual i was assigned to the aid dependency priming condition, and 0 otherwise. $T_{S,i}$ is an indicator taking a value of 1 if individual i was assigned to the self-sufficiency priming condition, and 0 otherwise. The omitted category is participants assigned to the control condition. ε_i is an idiosyncratic error term. Because randomization occurred within sessions, the error term is not clustered. We include controls for session-level fixed effects with the indicator variable α_s taking the value 1 if individual i was in session s, and 0 otherwise.

Thus, given random assignment to treatment conditions, β_1 identifies the effect of exposure to the aid dependency prime on the variable of interest. β_2 identifies the effect of exposure to the self-sufficiency prime on the variable of interest.

3.3 Heterogenous treatment effects

To determine whether our treatment effects vary based on individual-level variables, we estimate the following specification:

$$y_i = \beta_0 + \beta_1 T_{D,i} + \beta_2 T_{S,i} + \beta_3 (T_{D,i} \times X_i) + \beta_4 (T_{S,i} \times X_i) + \beta_5 X_i + \alpha_s + \varepsilon_i \tag{2}$$

where X_i is an observed characteristic of individual i. $T_{D,i} \times X_i$ is an interaction term between assignment to the aid dependency priming condition and the observed characteristic, and $T_{S,i} \times X_i$ is an interaction term between assignment to the self-sufficiency priming condition and the observed characteristic.

Thus, β_3 identifies the differential effect of exposure to the dependency prime for individuals with characteristic X_i, and β_4 identifies the differential effect of exposure to the sufficiency prime for individuals with characteristic X_i.

Dimensions of heterogeneous effects   Heterogeneous effects will be considered along the following primary dimensions:

1. Age (median split)

2. Gender

3. Whether an individual has ever received assistance from an international aid organization

3.4 Randomization check

To determine if randomization produced comparable groups, we will estimate equation 1 for the following demographic outcome variables:

1. Age

2. Gender

3. Whether an individual has ever received assistance from an international aid organization (binary)

3.5 Multiple comparisons

To address concerns about multiple inference, we will perform the analysis of the primary outcome variables described above using both naïve standard errors, and p-values adjusted for the false discovery rate (FDR) following Anderson (2008). In addition, we assess the joint significance of the treatment effect on the primary outcome variables using seemingly unrelated regression (SUR). Secondary outcome variables will be analyzed in the same fashion, but we will interpret the treatment effects with more caution.

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