Personality Traits and Economic Shocks Among the Ultra-Poor*

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June 2018

Preliminary and Incomplete

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Abstract

Personality characteristics and noncognitive skills are strong determinants of decision-making and economic outcomes. While personality is commonly believed to be fairly stable, especially after age 30, some evidence exists that changes in occupational and social roles can affect certain personality characteristics. In this paper, we study the short-term effects of two kinds of shocks on personality traits among youth from ultra-poor households in Uganda. In particular, we examine experimentally the impact of an income-generating asset transfer as well as a particular climate shock–a drought–on the most common personality measures from psychology: the Big Five personality traits. We find that the poverty graduation program as well as exposure to drought significantly increased measures of Extroversion, Conscientiousness, and Agreeableness. These findings suggest that both environmental factors and social programs can have substantial effects on personality traits known to be important in shaping economic outcomes.

Keywords: Personality, noncognitive skills, ultra-poor, drought, climate, Uganda.

JEL Codes: D01, D10, J24, O15, Q54.

*The authors thank Jesse Anttila-Hughes, Alessandra Cassar, Travis Lybbert, Bruce Wydick, and participants of 2018 Pacific Development Economics Conference and the University of San Francisco. A special word of gratitude as well to BRAC Uganda for incorporating this study into their larger Targeting the Ultra Poor: Graduation program and for excellent assistance with fieldwork.

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1 Introduction

Economists have traditionally considered external constraints such as lack of access to credit and/or insurance as explanations for the persistence of poverty. Recently, a more nuanced view of the conditions that exacerbate poverty has shifted some of the focus to personal psychology and how it creates internal constraints that in turn affect economic potential. Such factors include poor mental health and diminished intellectual and emotional abilities, including cognitive/executive function, self-control, and hope (Lybbert and Wydick, 2017; Kaur, Kremer and Mullainathan, 2015; Mani et al., 2013; Alloush, 2018). Cognitive and non-cognitive functioning and psychological well-being play an important role in determining an individual's earnings (Heckman, Stixrud and Urzua, 2006; Borghans et al., 2008; Alloush, 2018), so understanding the relationship between psychology and economic conditions is important for knowing how to improve overall well-being.

The economic literature has begun to explore the ways cognitive and noncognitive traits shape economic lives. In addition to the role of intelligence and cognition, noncognitive skills such as personality traits have been shown to be strong determinants of outcomes including schooling, wages, and crime (Borghans et al. (2008)). Still, relatively little is known about effects in the other direction, i.e. how economic conditions affect these traits. Joint determination and bidirectional causality is an econometric challenge that few studies have addressed adequately, despite intuition and evidence that various skills and outcomes interact in myriad ways.

With that said, relatively more attention has been paid to the impacts of early life or poverty on cognition ((Akee et al., 2018; Mani et al., 2013; Almond and Currie, 2011), while less research has examined how economic conditions affect personality traits. How persistent are these traits over an individual lifetime? What factors influence their evolution over the life-cycle? The answers to these questions could have major implications for understanding human well-being, promoting pro-social behavior, and more general for the design of optimal public policy.

Despite this significance, little is known about the short-term stability of noncognitive skills, and even less research has been conducted among poor communities around the world. Our paper contributes to this subject by using a sample of ultra-poor households in Uganda.[1] In particular, we look at the short-term impacts of two very different shocks on the personality traits of individuals: (1) a unique, intensive poverty graduation program based on productive asset transfers/training and (2) recent experience with drought. Our results show that two weeks after the asset transfer and training, individuals increased measures on personality traits related to personal growth and stability. Individuals who had experienced drought, how-

[1] The ultra-poor are defined as those living on less than 50 cents a day (in 2007) by the International Food Policy Research Institute.

ever, exhibited decreased measures of two key personality traits—conscientiousness and agreeableness.

2 Personality and Economic Behavior

An individual's personality characteristics are among the core factors that dictate his/her behavior. Personality is defined as "the interactive aggregate of personal characteristics that influence an individual's response to the environment" (Wei et al., 2017). Psychologists have developed several measurement systems of personality traits which economists have been increasingly using. Most prominent among these measurement systems is the Big Five personality inventory which, through factor analysis of hundreds of personality traits, divide personality into five broad dimensions: Openness to Experience (also called intellect or culture) which relates to inventiveness and curiosity, Conscientiousness (organization/efficiency), Extroversion (outgoing/energetic), Agreeableness (friendly/compassionate), and Neuroticism (also called emotional stability).[2] These five personality factors can be further grouped into two higher-order factors: Alpha which represents stability and socialization and includes agreeableness, conscientiousness, and emotional stability. And, Beta which represents plasticity and personal growth and includes openness and extroversion (Digman, 1997; DeYoung, 2006).

Personality traits are shown to be strongly associated with economic outcomes and behaviors (Silles, 2010; Lee and Ohtake, 2012; Störmer and Fahr, 2013; Erdheim, Wang and Zickar, 2006; Hampson et al., 2007). For example, conscientiousness is conceptually related to risk aversion, leisure preference, and discounting; a range of studies in the psychology literature show that self-control, perseverance, and other aspects of conscientiousness are major contributors to success in school and later in life (Chamorro-Premuzic and Furnham, 2003; Duckworth and Seligman, 2005); Noftle and Robins (2007); Dilchert et al. (2007); Paunonen and Ashton (2001); Salgado (1997). Emotional stability (the obverse of Neuroticism) is also shown to be predictive of earnings and job performance (Nyhus and Pons, 2005; Salgado, 1997). Störmer and Fahr (2013) find that personality affects work attendance in different ways for different groups. Childhood agreeableness, conscientiousness and intellect/imagination influence adult health status indirectly through educational attainment, healthy eating habits and smoking (Hampson et al., 2007). Chiteji (2010) verifies that noncognitive skills are positively associated with positive health-related behaviors. Heckman, Stixrud and Urzua (2006) and Judge and Hurst (2007) show using data from the 1979 cohort of the National Longitudinal Survey of Youth, individuals who report positive self-evaluations when measured in young adulthood predict income in mid-life and, further enhance the benefits of family socioeconomic status and

[2]These factors represent personality broadly and are each formed from a number of distinct and specific personality characteristics (John and Srivastava, 1999; John, Donahue and Kentle, 1990; Costa Jr and McCrae, 1992) present evidence that most of the variables used to assess personality in the personality psychology literature can be mapped into one or more of the factors of the Big Five.

academic achievement on mid-life income. In addition, the authors show that noncognitive skills also play a role in predicting risky behavior such as crime and drug/alcohol consumption.

Do these personality traits change over time? While these characteristics have been shown to change over a life-cycle, they are generally fairly stable after the age of 30 (Cobb-Clark and Schurer, 2012). Cobb-Clark and Schurer (2012) also evaluate effect of different shocks on personality. They find that reporting a large number of adverse health-related events is associated with a small decrease in men's emotional stability and conscientiousness. Moreover, the observed changes in personality due to health or family related shocks are not very large. Thus, intra-individual personality changes are not generally affected by adverse life events. However, major shifts in social and occupational roles (such as getting a job for the first time or becoming a parent) is shown to have lasting effects on personality traits (Clausen and Gilens, 1990; Roberts and Chapman, 2000; Roberts, Helson and Klohnen, 2002; Gottschalk, 2005). While reverse causality is difficult to disentangle in most of these studies—a change in personality may well have contributed to the change in employment or social status;Gottschalk (2005) provides quasi-experimental analysis that suggests causal effect of employment changes on personality traits.

Recent work has shown that climate is associated with average personality characteristics (Wei et al., 2017). Climate has been shown to affect human behavior (not necessarily through personality). Deviations from normal precipitation and mild temperatures systematically increase the risk of conflict, often substantially (Hsiang, Burke and Miguel, 2013). In addition, some climatic events are shown to increase the risk of conflict as well as decrease human productivity (Hsiang, 2010; Graff Zivin and Neidell, 2013). Violent behavior is also shown to be affected by weather; there is a positive and increasing relationship between temperature and aggravated crime that moderates beyond temperatures of 80^oF and then turns negative beyond 90^oF (Gamble and Hess, 2012). Hence, the question remains if conflicts and crimes are at least partially explained by changes in personality due to the weather/climate. In this paper, we evaluate if droughts directly affects personality traits among a very poor population in rural Uganda.

It is still unclear how poverty affects personality. When it comes to long-run effects, recent evidence suggests that cash transfers during childhood positively affect personality traits in adulthood (Akee et al., 2018). But do shocks affect personality in the short run? While personality is shown to be fairly stable after the age of 30 among general populations in high-income countries,[3] it is unclear if this is true among the poor, especially the poorest-of-the-poor living in extreme poverty. Schofield et al. (2018) analyze the extreme conditions of poverty and how these conditions can affect an individual's observed cognitive and executive function. The authors review the psychology and economics literature to suggest that conditions of poverty may reduce people's cognitive and executive functions. A similar thought process could be

[3]94% of the sample of individuals in this study are between the ages of 18 and 30

extended to noncognitive skills; it may be that people experiencing conditions of extreme poverty push people away from their stable long-run personality traits.

The the rest of this paper is structured as follows: Section 2 discusses the graduation program and source of the data with some descriptive statistics. Section 3 highlights the main estimation strategy and presents the results. Section 4 concludes.

3 Program Details and Data

The data for this study comes from an impact evaluation of a poverty graduation program implemented in rural Uganda. These programs have been implemented in many different countries and contexts around the world and shown high levels of success (Banerjee et al., 2015, 2016). The goal of this type of poverty alleviation program is to provide households with an income-generating asset while also addressing the multitude of stresses and constraints evident in extreme poverty; this is done through training, short-term income support, and long-term life coaching during recurrent household visits. In Uganda, a randomized controlled trial is currently being conducted to evaluate the impact of such a program among the rural ultra-poor. The randomization was done at the village level and the individuals selected to participate in the program were identified as the poorest-of-the-poor in the targeted villages.[4]

While the length of the program is two years and involves training, life coaching, and psychological support, the data on personality used in this paper was gathered three to four weeks after the asset transfer and initial training. Income generating assets were distributed to every selected individual (in the treatment group) to serve as a new source of long-term income. In this rural setting, income generating assets are mainly livestock and thus beneficiaries were given a choice between chickens, pigs, and goats. The decision regarding which assets was given took into consideration the beneficiary's preference but also their capacity in terms of land available for grazing and the amount of time the beneficiary was able to commit. Beneficiaries were also given two bags of potato vines to smooth out their food consumption until income from their newly acquired assets kicked in.

The beneficiaries also underwent a training when they received their income-generating assets. This was training focused on the best management practices for their selected asset and was done in a group setting among other beneficiaries from their village. In addition, a financial literacy training was conducted

[4]A multi-level verification was done before categorizing any individual as "poorest of poor" or "ultra-poor". The sample frame used the 2004 national census data available for targeted districts: Luwero, Bombo, Zerobwe, Kigumba and Bweyale. From this census data, we identified the 10,000 poorest households for in-person verification. Next, we conducted door-to-door surveys and collected data on their physical assets, income sources, household size etc. The data from in-person verification was used to generate a poverty scorecard, that is, a numerical value on household's living standard. Based on poverty score card, poorest 2,400 individuals were selected for the RCT. 1,600 were randomly assigned to treatment and 800 to control. The selected individual did not have to be the head of the household but he/she had to be healthy enough to make use of support/aid and work on any income generating activities.

in the same group setting where the main topic of discussion was basic household finance management. Trainers also discussed the benefits of savings and how to build up savings slowly and steadily. They talked about best practices in daily life, how to plan expenditure, savings, and setting goals and priorities.

The baseline survey for the study took place nearly one month before the asset transfer and the training. Information was collected about household expenditure and income, employment, assets, and other health related information. The GPS location of the household was also recorded.

The personality surveys were conducted beginning three weeks after the assets were distributed and trainings were given. We used a 44-item questionnaire to evaluate the Big Five personality traits as modeled by John and Srivastava (1999). Uganda is a multi-lingual country, thus, we had to translate the personality questionnaire into several different languages. To avoid discrepancy in translation, we dropped seven questions from 44 that were deemed redundant after translation due to lack of vocabulary/nuance in the local language to adequately differentiate some of the questions from others. Hence, our personality traits scores are based on a 37-item questionnaire (shown in the Appendix along with the dropped questions).

Due to budget and resource constraints, the personality surveys were conducted over the phone on a subsample of the original treatment and control groups. Our subsample consists of 591 treated (out of 1,600) and 390 in the control (out of 800).[5] Given that the interview was conducted over the phone, we were not able to track exact location of the interviewee at the time of personality survey. However, when we match climatic conditions to interviewee, we use GPS coordinates from baseline survey and not the personality survey. Doing this, we assume that individuals did not move or change locations after the baseline surveys. This assumption is only important for those in the control group because individuals in the treatment group maintained regular contact with the program officers. Thus, we can be certain that those in the treatment did not move far. Even if we assume control group individuals moved after baseline survey, our results would be biased only if they moved far enough so as to experience different set of weather conditions. Since the interviewees are ultra-poor, the likelihood of moving to a new district is rather low.

Trainings sessions and distribution of assets coincided with drought in many regions. Some regions experienced drought-like conditions in months leading up to asset distribution and personality surveys. We use data on one of the drought indices available on Sub-Saharan African Drought Monitoring And Seasonal Forecasting System, also known as African Drought Monitor. The system has been developed by Hydrology Research Group at Princeton University (Sheffield et al., 2014). The system obtains a multi-decadal reconstruction of the terrestrial water cycle by combining the Variable Infiltration Capacity (VIC) land surface hydrological model with a merged reanalysis–observation dataset (Liang, Wood and Letten-

[5]Phone surveys were conducted among 700 individuals in the treatment households and 500 in the control, however, data clean up and matching indicated that the enumerators conducted the interview with the incorrect person in the household.

maier, 1996). This historical data forms the climatic conditions against which current conditions are compared. Data for current conditions comes from a real-time monitoring system (2009 - present) driven by remotely sensed precipitation and atmospheric analysis data that track drought conditions. The index is calculated by determining the percentile of the daily average of relative soil moisture in each 0.25°*0.25° grid cell with respect to its cumulative probability distribution function provided by the historical simulations (1950–2008). Following the authors of African Drought Monitor, we use a threshold value of 20 percentile as an indication of agriculture drought (Sheffield et al., 2014).[6]

3.1 Sample Characteristics

The sample of 981 individuals comes from 215 villages in five rural districts in Uganda.

Table 1 presents some descriptive statistics of the sample at the individual and household level and shows differences across treatment to test for balance. The participants are young, with an average age of 24 and just under half of them are married. The come from households of size 6 and are considerably food insecure: just under 75% of households worried about being able to half enough food in the last month.

2017 was one of the warmest year in Uganda in recent times. This meant a large part of Uganda went through drought like conditions. Hence, more than half of our sample population experienced drought like conditions for about a month and about a quarter of it experienced drought conditions for at least 2 months. Table 2 shows balance across drought conditions.

3.2 Personality Scores

The sample distribution and sample mean of personality trait scores are given in figure 1 and table 3. In table 3, we compare our means with samples from Africa, North America and Eastern Europe collected in another study (Schmitt et al. (2007)). Column 1 shows mean scores of our sample from rural Uganda. The samples in column 2, 3 and 4 comprise of college students spread across various countries in respective regions. We see that our sample scores are closer to samples from Africa in the other study.

While the scores above display means of each of the questions that fall into a personality characteristic, the main analysis below uses principal component analysis to construct an index for each personality characteristic.[7] We analyze internal consistency of personality trait scales using Cronbach's alpha. A score above

[6]The African Drought Monitor provides indices that measure meteorological, hydrological and agricultural droughts. Meteorological drought represent a dry weather pattern in a given area. Hydrological drought usually occurs after several months of meteorological drought when low water supply becomes evident in streams, reservoirs, and groundwater levels. Agricultural drought represent conditions when soil moisture is insufficient and results in the lack of crop growth and production. In this paper, we use a drought index representing agricultural drought for our study. The African Drought Monitor provides data on agricultural drought in form of soil moisture based drought index (Sheffield et al., 2014).

[7]Results using means are available in the Appendix.

0.70 is considered a good score for the internal consistency of the measure. We get a score of 0.46, 0.79, 0.51, 0.63 and 0.64 for Openness, Conscientiousness, Extroversion, Agreeableness and Neuroticism respectively. This is similar to other studies which often find alpha scores lower than 0.70 with relatively uneducated sample population (Gurven et al. (2013)). We do see higher Cronbach's alpha scores for personality with the more educated sample population.

4 Empirical Strategy and Results

4.1 Empirical Strategy

The main empirical strategy used in this analysis is the following:

$$PT_i = \beta_0 + \beta_1 T_i + \beta_2 D_i + \beta_3 T_i * D_i + \rho \mathbf{x_i} + \mathbf{e_i}$$

Where PT_i is a personality trait (one the of Big Five), T_i is indicator variable for receiving the treatment (being part of the graduation program) and D_i if for drought where we considered droughts of various level of severity. X_i is a vector of individual and household characteristics and e_i is the unobserved error.

Personality can be assumed to be changing based on geographical area. For example, individuals in villages close to each other would have similar personality compared to individuals in villages in another district. To control for such intra-cluster correlation, we grouped villages based on geographical distance between them. We kept minimum cluster size at 1 and physical distance to 3km. Hence, any two villages within 3 km of each other would be in same group. We control for fixed effects at cluster level where cluster refers to groups formed using aforementioned strategy. However, these fixed effects also eats up a lot of variation in drought conditions, we decided to take a safe approach and control for cluster level effects. Hence, results on impact of drought are underestimated but unbiased.

Although we extensively discussed each question during the training of the enumerators, the low literacy rate of interviewees meant that the questions had to be rephrased occasionally to ensure interviewees understood them correctly. Each enumerator explained questions using different examples and sometimes interpreted answers when a direct option was not chosen. Enumerators had their own way of explaining the question and interpreting the answers. Hence, to control for such difference in enumerator-interviewee interaction, we control for enumerator fixed effects.

4.2 Treatment Effects

Figure 2 summarizes the effect of the treatment on the big five personality traits. Those in the treatment group exhibit higher levels of extroversion, conscientiousness, and agreeableness which are personality traits related to personal growth and stability. Treatment affects traits that belong to both alpha and beta factors that describe personality (Wei et al., 2017). Tables 2 through 6 show detailed results for the Big Five personality traits. Age and sex play are statistically significant in predicting most personality traits. The treatment increases Conscientiousness by by 0.115 standard deviations (SD), Extroversion by 0.208 SD, and Agreeableness by 0.164 SD.

It is worth noting that treatment took place only two weeks before the personality interviews took place. Individuals receiving this treatment did not have enough time to have a marked increase in their income. However, through the treatment, they received productive assets and training. Their expectations about their future employment and roles may have changed. It could be that this change in their social roles and status contributed in some way to their positive changes in some of their personality characteristics.

4.2.1 Trait Prominence

The treatment may affect the prominence of a trait; the answer to each question (shown in the Appendix) is given a score of 1-5. For the set of questions representing a certain trait, we construct an average of the scores. We then find the mean of the scores for all personality traits. The difference between the average personality score and the overall average, we will refer to as trait prominence p_b.

Table 7 shows the results for all five personality traits. While controlling for the overall mean score of each individual, the treatment still has an effect of the prominence of traits. The treatment increases the relative prominence of Conscientiousness and Agreeableness (Column 3 results) while decreasing Openness, Extroversion, and Neuroticism.

4.2.2 Men and Women

Columns 7 and 8 of tables 2-6 show results for men and women separately. While the coefficients are not statistically different from each other, the changes in personality due to the treatment seem to be mainly among men.

4.3 The Effects of Drought

Tables 2-6 show that drought has an important effect on personality trait. Individuals living in an area with drought show lower levels of Conscientiousness, Extroversion, and Agreeableness. These results are sig-

nificant at the 10% level. Drought does not seem to affect the other two traits, Openness and Extroversion.

5 Conclusion

In this paper, we look at the roll out of an ultra-poor graduation program and analyze its short-term effect on personality traits immediately after the asset transfer and training. We also look at drought conditions during months leading up to the roll out and evaluated the effect of drought on personality. This is an important finding since past studies do not say anything about how these types of interventions affect personality traits among the poor. It is encouraging to find that aid not only improves physical well-being but also mental well-being of the beneficiaries. Since, personality affects virtually every outcome in an individual's life, promoting efforts that positively effect personality would be of great help in long-run.

We also find that drought conditions decrease agreeableness and conscientiousness in both genders. It also affects neuroticism and openness negatively in men. This result can be seen as a missing link in the literature which says that the climatic events that increase the risk of conflict are similar to the events that would have an adverse effect on agriculture (Schlenker and Roberts, 2009). Hence, addressing personality and economic conditions post drought should be of great concern.

The results of this paper are an important addition to literature on the psychology of poverty. This paper sheds light on how poverty interventions and environment can influence personality among the poorest of poor. Due to strong effects of personality on various life outcomes, any intervention designed to improve personality could have a multiplier effect on an individual's economic well-being. It is critical that development programs focus on the psychological constraints as much as the external economic ones. Psychological well-being is an end in itself, but it may be means to achieving even better economic outcomes.

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Tables

TABLE I: Descriptive Statistics and Balance

	Control	Treatment	Difference	p-value: H0 diff=0
Individual Level				
Female	0.449	0.45	-0.001	0.966
Age	24.629	23.912	0.717	0.047
Married	0.454	0.383	0.071	0.029
Feeling depressed/stressed	0.567	0.523	0.044	0.178
Years of Education	8.397	8.03	0.367	0.101
Literate	0.778	0.778	0	0.995
Household Level				
Household Size	24.629	23.912	0.717	0.047
Wealth Index	-0.022	0.015	-0.037	0.569
Meals Per day	2.085	2.069	0.015	0.7
At least 1 employed member in HH	0.572	0.596	-0.024	0.459
Taken a Loan in the past year	0.149	0.193	-0.044	0.075
Savings	0.372	0.355	0.016	0.6
Worried about food last month	0.746	0.731	0.015	0.597
Head unemployed	0.41	0.477	-0.067	0.039
N	390	591	981	

TABLE II: Openness Results

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7) Male	(8) Female
treatment	0.00822	0.00147	0.00962	0.0107	0.00258	0.0372	0.106	-0.0320
	(0.127)	(0.129)	(0.124)	(0.0331)	(0.0328)	(0.0364)	(0.122)	(0.117)
drought						-0.0168		
						(0.104)		
*treatment*drought*						-0.123	-0.276*	0.00448
						(0.129)	(0.162)	(0.187)
age		-0.0490**	-0.0304	0.0138	0.0164	0.0145	-0.0176	0.0438*
		(0.0213)	(0.0217)	(0.0128)	(0.0146)	(0.0155)	(0.0280)	(0.0249)
age_sq		0.000865**	0.000602	-0.000272	-0.000317	-0.000285	0.000182	-0.000690*
		(0.000389)	(0.000423)	(0.000208)	(0.000237)	(0.000252)	(0.000484)	(0.000360)
female		-0.0761	-0.0768	-0.117**	-0.155***	-0.156***		
		(0.0558)	(0.0485)	(0.0526)	(0.0529)	(0.0531)		
Constant	-0.00495	0.694*	0.0352	0.436	0.469	0.496	0.876*	-0.0210
	(0.112)	(0.353)	(0.260)	(0.289)	(0.327)	(0.326)	(0.444)	(0.540)
Controls			Yes	Yes	Yes	Yes	Yes	Yes
Enumerator Fixed Effect				Yes	Yes	Yes	Yes	Yes
Observations	981	981	965	965	965	965	532	433
R-squared	0.000	0.003	0.018	0.487	0.499	0.499	0.490	0.566

Cluster robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE III: Conscientiousness Results

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7) Male	(8) Female
treatment	0.0478	0.0511	0.0557	0.115**	0.0903**	0.115**	0.143***	0.134
	(0.140)	(0.141)	(0.141)	(0.0474)	(0.0398)	(0.0480)	(0.0279)	(0.104)
drought						-0.228*		
						(0.114)		
*treatment*drought*						0.0260	-0.178	-0.0213
						(0.112)	(0.112)	(0.189)
age		-0.0256	-0.00896	0.0483**	0.0508***	0.0538**	0.0636***	0.0452*
		(0.0154)	(0.0135)	(0.0193)	(0.0184)	(0.0215)	(0.0220)	(0.0246)
age_sq		0.000605**	0.000365	-0.000746**	-0.000786***	-0.000838**	-0.000978***	-0.000632*
		(0.000246)	(0.000244)	(0.000302)	(0.000277)	(0.000328)	(0.000282)	(0.000351)
female		-0.109*	-0.111*	-0.121**	-0.147***	-0.148**		
		(0.0589)	(0.0590)	(0.0489)	(0.0524)	(0.0540)		
Constant	-0.0288	0.269	-0.192	-0.394	-0.252	-0.0893	-0.413	-0.427
	(0.134)	(0.308)	(0.272)	(0.381)	(0.367)	(0.355)	(0.389)	(0.486)
Controls			Yes	Yes	Yes	Yes	Yes	Yes
Enumerator Fixed Effect				Yes	Yes	Yes	Yes	Yes
Observations	981	981	965	965	965	965	532	433
R-squared	0.001	0.005	0.017	0.657	0.674	0.675	0.695	0.688

Cluster robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE IV: Extraversion Results

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7) Male	(8) Female
treatment	0.0858	0.0922	0.103	0.125**	0.200***	0.208***	0.249***	0.0968
	(0.0919)	(0.0969)	(0.0912)	(0.0473)	(0.0426)	(0.0267)	(0.0410)	(0.0854)
drought						-0.216*		
						(0.109)		
*treatment*drought*						0.0256	-0.102	0.264
						(0.153)	(0.197)	(0.302)
age		0.00544	0.0175	0.0568***	0.0571***	0.0612***	-0.00293	0.147***
		(0.0341)	(0.0373)	(0.0137)	(0.0104)	(0.0106)	(0.0297)	(0.0312)
age_sq		2.95e-05	-0.000156	-0.000853***	-0.000843***	-0.000919***	0.000304	-0.00261***
		(0.000667)	(0.000739)	(0.000290)	(0.000224)	(0.000224)	(0.000599)	(0.000529)
female		-0.173***	-0.161**	-0.181**	-0.191**	-0.189**		
		(0.0573)	(0.0596)	(0.0728)	(0.0711)	(0.0712)		
Constant	-0.0517	-0.127	-0.494	-0.556**	-0.610***	-0.461**	0.170	-1.912***
	(0.0529)	(0.477)	(0.514)	(0.255)	(0.214)	(0.220)	(0.417)	(0.501)
Controls			Yes	Yes	Yes	Yes	Yes	Yes
Enumerator Fixed Effect				Yes	Yes	Yes	Yes	Yes
Observations	981	981	965	965	965	965	532	433
R-squared	0.002	0.010	0.014	0.358	0.386	0.387	0.440	0.415

Cluster robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE V: Agreeableness Results

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7) Male	(8) Female
treatment	0.164	0.154	0.156	0.188***	0.196***	0.164**	0.122	0.201
	(0.108)	(0.110)	(0.112)	(0.0457)	(0.0656)	(0.0740)	(0.0819)	(0.141)
drought						-0.347*		
						(0.185)		
*treatment*drought*						0.207	0.322	0.139
						(0.129)	(0.195)	(0.239)
age		-0.0587***	-0.0354**	0.0245	0.0217	0.0312	0.0459*	0.0151
		(0.0167)	(0.0153)	(0.0215)	(0.0238)	(0.0274)	(0.0241)	(0.0373)
age_sq		0.00101***	0.000682**	-0.000466	-0.000386	-0.000559	-0.000709*	-0.000264
		(0.000331)	(0.000314)	(0.000375)	(0.000414)	(0.000481)	(0.000379)	(0.000648)
female		-0.0150	-0.0188	-0.00228	-0.0166	-0.0120		
		(0.0453)	(0.0430)	(0.0394)	(0.0361)	(0.0369)		
Constant	-0.0986	0.721**	0.0930	-0.256	-0.197	0.0213	-0.436	-0.277
	(0.112)	(0.284)	(0.273)	(0.326)	(0.336)	(0.383)	(0.357)	(0.496)
Controls			Yes	Yes	Yes	Yes	Yes	Yes
Enumerator Fixed Effect				Yes	Yes	Yes	Yes	Yes
Observations	981	981	965	965	965	965	532	433
R-squared	0.006	0.010	0.021	0.524	0.538	0.540	0.525	0.591

Cluster robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE VI: Neuroticism Results

VARIABLES	(1)	(2)	(3)	(4)	(5)	(6)	(7) Male	(8) Female
treatment	0.106	0.115	0.111	0.0573	0.0395	0.0318	0.0383	-0.0236
	(0.147)	(0.154)	(0.150)	(0.0388)	(0.0323)	(0.0337)	(0.0686)	(0.0647)
drought						0.0963		
						(0.103)		
*treatment*drought*						-0.00902	-0.0642	0.204
						(0.112)	(0.210)	(0.144)
age		0.0375	0.0130	-0.0205	-0.0300	-0.0315	-0.0653	0.0142
		(0.0405)	(0.0418)	(0.0311)	(0.0293)	(0.0310)	(0.0440)	(0.0576)
age_sq		-0.000560	-0.000206	0.000445	0.000586	0.000613	0.00123	-0.000243
		(0.000813)	(0.000802)	(0.000594)	(0.000530)	(0.000555)	(0.000757)	(0.000878)
female		0.257***	0.255***	0.213***	0.215***	0.215***		
		(0.0577)	(0.0620)	(0.0444)	(0.0494)	(0.0492)		
Constant	-0.0636	-0.752	-0.184	0.442	0.260	0.192	0.575	0.218
	(0.128)	(0.575)	(0.689)	(0.444)	(0.426)	(0.408)	(0.656)	(0.878)
Controls			Yes	Yes	Yes	Yes	Yes	Yes
Enumerator Fixed Effect				Yes	Yes	Yes	Yes	Yes
Observations	981	981	965	965	965	965	532	433
R-squared	0.003	0.021	0.028	0.420	0.463	0.463	0.528	0.412

Cluster robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

TABLE VII: Prominence Results

	(1)	(2)	(3)	(4) Male	(5) Female
			Openness		
treatment	-0.0238	-0.0550**	-0.0856***	-0.111***	-0.00623
	(0.0213)	(0.0267)	(0.0196)	(0.0375)	(0.0304)
drought		0.0340	0.0188	-0.0618	0.0884
		(0.0394)	(0.0522)	(0.0455)	(0.0797)
*treatment*drought*			0.0497	0.140**	-0.0926
			(0.0558)	(0.0681)	(0.0867)
			Concientiousness		
treatment	0.0401*	0.0431***	0.0803***	0.0618***	0.159***
	(0.0220)	(0.0106)	(0.0242)	(0.0194)	(0.0344)
drought		-0.0912***	-0.0728**	-0.0403	-0.136***
		(0.0204)	(0.0277)	(0.0357)	(0.0236)
*treatment*drought*			-0.0602**	-0.0438	-0.120***
			(0.0234)	(0.0339)	(0.0328)
			Extraversion		
treatment	-0.0810***	-0.0451**	-0.0759**	-0.0430	-0.170***
	(0.0274)	(0.0211)	(0.0297)	(0.0544)	(0.0429)
drought		0.0136	-0.00166	-0.0170	0.0525
		(0.0261)	(0.0300)	(0.0532)	(0.101)
*treatment*drought*			0.0499	0.0213	0.136*
			(0.0342)	(0.0856)	(0.0721)
			Agreeableness		
treatment	0.0544**	0.0685*	0.119***	0.0809**	0.220***
	(0.0265)	(0.0372)	(0.0195)	(0.0347)	(0.0422)
drought		-0.0573	-0.0320	-0.0617	0.0217
		(0.0649)	(0.0705)	(0.0892)	(0.0533)
*treatment*drought*			-0.0825*	-0.0296	-0.186***
			(0.0469)	(0.0807)	(0.0347)
			Neuroticism		
treatment	0.0103	-0.0116	-0.0382*	0.0112	-0.202***
	(0.0213)	(0.0191)	(0.0193)	(0.0219)	(0.0302)
drought		0.101***	0.0877**	0.181**	-0.0270
		(0.0294)	(0.0343)	(0.0676)	(0.0654)
*treatment*drought*			0.0431	-0.0875	0.263***
			(0.0411)	(0.0600)	(0.0442)

Cluster robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Figures

The Big Five domains and their facets

Factor	Facets	Definition of Factor	ACL[a] Marker Items for Factor
I. Openness to Experience (Intellect)	Fantasy, Aesthetics, Feelings, Actions, Ideas, Values	The degree to which a person needs intellectual stimulation, change, and variety.	Commonplace, Narrow-interest, Simple- vs. Wide-interest, Imaginative, Intelligent
II. Conscientiousness	Competence, Order, Dutifulness, Achievement striving, Self-discipline, Deliberation	The degree to which a person is willing to comply with conventional rules, norms, and standards.	Careless, Disorderly, Frivolous vs. Organized, Thorough, Precise
III. Extraversion	Warmth, Gregariousness, Assertiveness, Activity, Excitement seeking, Positive emotions	The degree to which a person needs attention and social interaction.	Quiet, Reserved, Shy vs. Talkative, Assertive, Active
IV. Agreeableness	Trust, Straight-forwardness, Altruism, Compliance, Modesty, Tender-mindedness	The degree to which a person needs pleasant and harmonious relations with others.	Fault-finding, Cold, Unfriendly vs. Sympathetic, Kind, Friendly
V. Neuroticism (Emotional Stability)	Anxiety, Angry hostility, Depression, Self-consciousness, Impulsiveness, Vulnerability	The degree to which a person experiences the world as threatening and beyond his/her control.	Tense, Anxious, Nervous vs. Stable, Calm, Contented

Source: Hogan and Hogan (2007)

FIGURE I: The Big Five Domains and their Facets

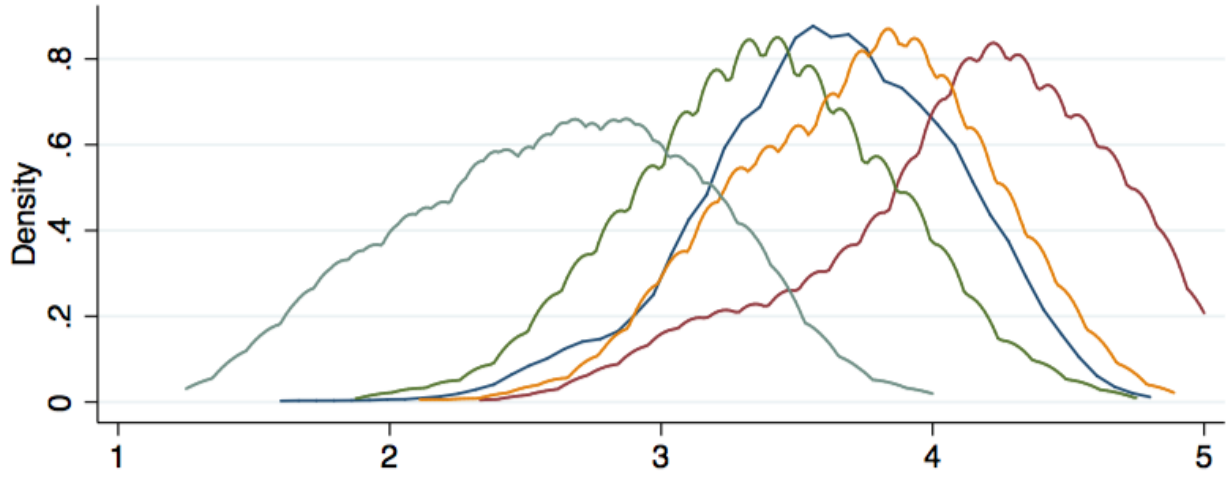

FIGURE II: Density distribution of personality traits scores of our sample population. Blue: Openness, Red: Conscientiousness, Green: Extraversion, Yellow: Agreeableness, Gray: Neuroticism

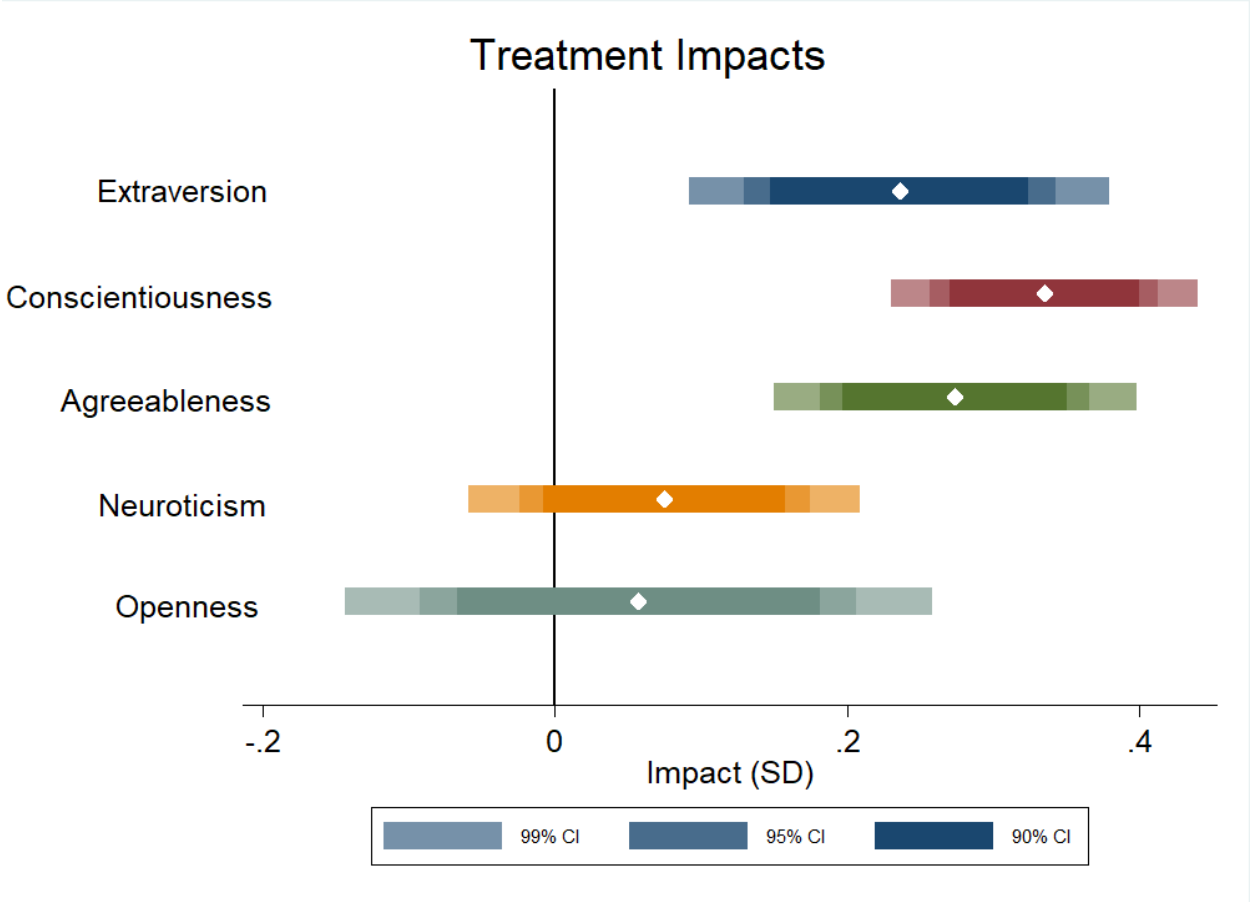

FIGURE III: Treatment effects in SD on the Big Five Personality Traits

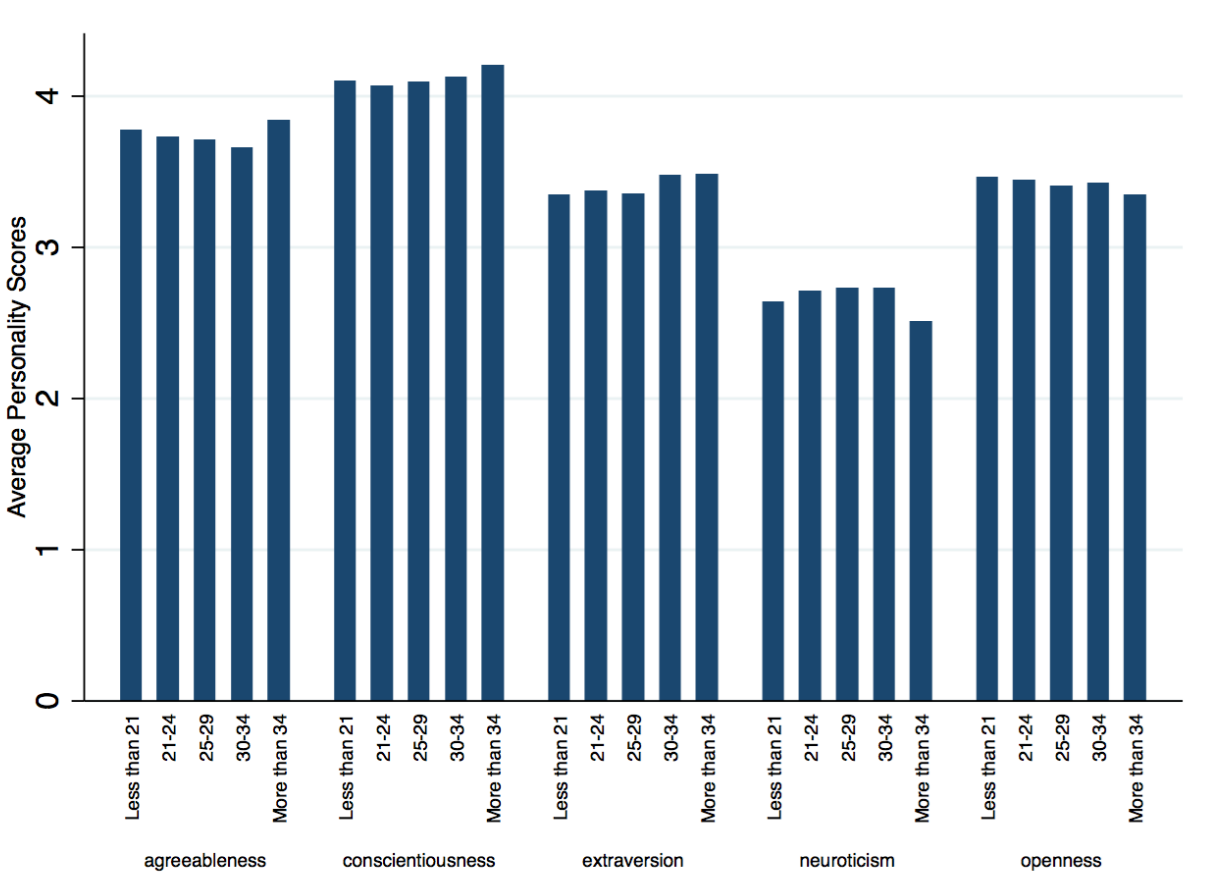

FIGURE IV: Average personality trait scores per age group

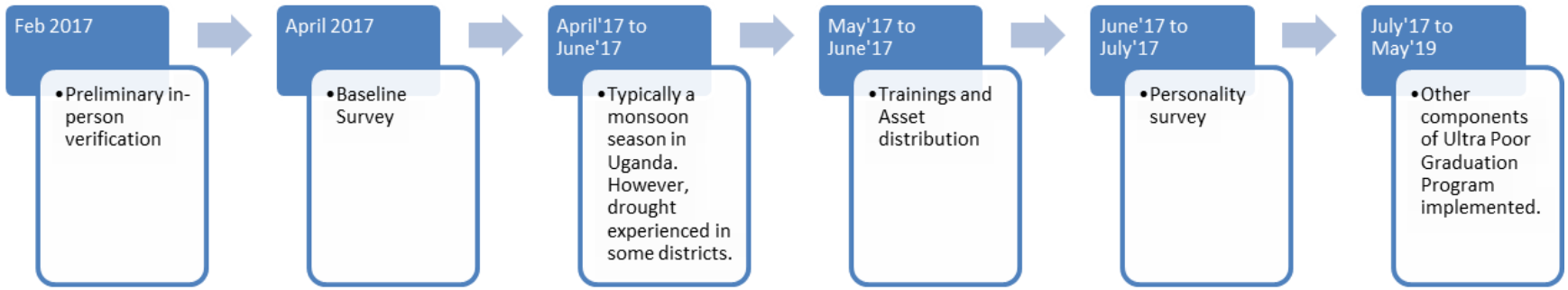

FIGURE V: Timeline of intervention

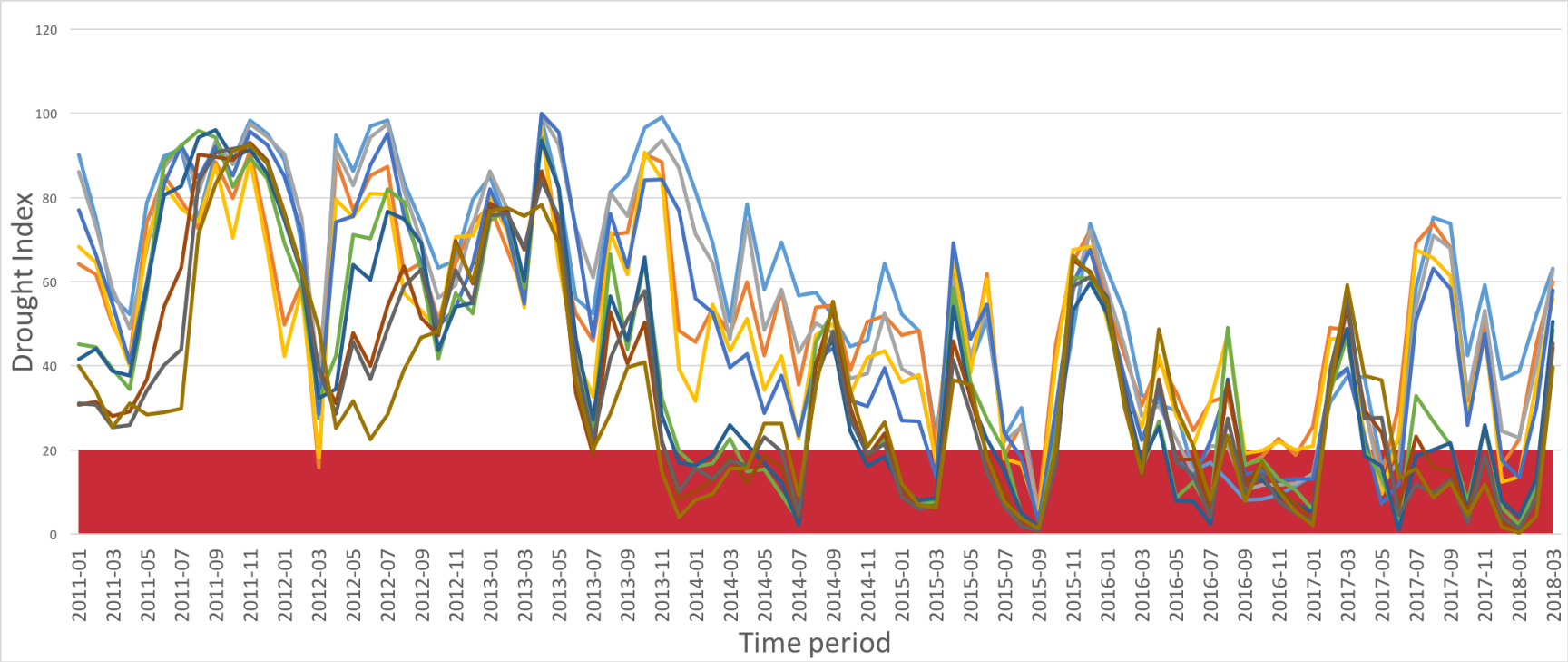

FIGURE VI: Drought index in previous years. Each line represents a 0.25°*0.25° grid cell that has atleast one treatment or control village. A drought index of less than 20 indicates a drought.

A Appendix

A.1 Big Five Personality Survey

Big Five personality questionnaire consists of following 44 questions. Questions marked with asterix (*) were skipped in our surveys.

Please enter a number next to each question to indicate extent to which you agree or disagree with that statement.

1 - Disagree Strongly

2 - Disagree

3 - Neither Agree or Disagree

4 - Agree

5 - Strongly Disagree

I see myself as someone who ...

Q1 _____ is talkative

Q2 _____ tends to find fault with others

Q3 _____ does a thorough job

Q4 _____ is depressed, blue

Q5 _____ is original, comes up with new ideas

Q6 _____ is reserved

Q7 _____ is helpful and unselfish with others

Q8 _____ can be somewhat careless

Q9 _____ is relaxed, handles stress well

Q10 _____ is curious about many different things

Q11 _____ is full of energy

Q12 _____ starts quarrels with others

Q13 _____ is a reliable worker

Q14 _____ can be tense

Q15 _____ is ingenious, a deep thinker

*Q16 _____ generates a lot of enthusiasm

Q17 _____ has a forgiving nature

Q18 _____ tends to be disorganized

Q19 _____ worries a lot

*Q20 _____ has an active imagination

Q21 _____ tend to be quiet

Q22 _____ is generally trusting

Q23 _____ tends to be lazy

Q24 _____ is emotionally stable, not easily upset

*Q25 _____ is inventive

Q26 _____ has an assertive personality

Q27 _____ can be cold and aloof

Q28 _____ perseveres until the task is finished

Q29 _____ can be moody

*Q30 _____ values artistic, aesthetic experiences

Q31 _____ is sometimes shy, inhibited

Q32 _____ is considerate and kind to almost everyone

*Q33 _____ does things efficiently

*Q34 _____ remains calm in tense situations

Q35 _____ prefers work that is routine

Q36 _____ is outgoing, sociable

Q37 _____ is sometimes rude to others

Q38 _____ makes plans and follows through with them

Q39 _____ gets nervous easily

*Q40 _____ likes to reflect, play with ideas

Q41 _____ has a few artistic interests

Q42 _____ likes to cooperate with others

Q43 _____ is easily distracted

Q44 _____ is sophisticated in art, music, or literature