Shocks And Personality

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Abstract: Personality is among the core factors that dictate any kind of behavior. There has been considerable literature about effect of personality on outcomes in education, health and labor market. The literature on how experiences and environment influences personality, however, is still scarce. Most of the existing literature on measuring personality and factors influencing personality is set in developed countries and uses a sample set of educated/literate individuals. In this paper, we look at roll out of an ultra-poor[1] graduation[2] program and analyze its effect on personality immediately after asset distribution and training. We also look at climatic conditions during months leading up to the roll out and evaluate effects of climate on personality. We find that getting aid/assistance increases conscientiousness in both genders and increases agreeableness in men. On the other hand, drought conditions decrease agreeableness and conscientiousness. We also find that drought conditions increase neuroticism in men.

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[1] Ultra poor: A term coined by Bangladesh Rural Action Committee (BRAC) to represent poorest of poor. It represents population which is too poor to even have access to development, microfinance and social interventions.
[2] Graduation: The term graduation was coined in early 2000's. It essentially means moving poor from below to above poverty line or "graduating poor above poverty line"

1. Background

Work on classification of personality traits can be traced back to 1936. Gordon Allport and S. Odbert attempted to classify 18000 adjectives into 4 personality traits i.e Personal traits, Temporary traits, Social evaluation traits and Metaphorial traits (Allport & Odbert, 1936). Later, the Sixteen Personality Factor (16PF) model was developed over several decades of empirical research by Raymond B. Cattell, Maurice Tatsuoka and Herbert Eber (Cattell et al., 1957). This was closely followed by research which found five fairly strong all encompassing personality factors. These were surgency, agreeableness, dependability, emotional stability and culture (Tupes & Christal, 1961). At least two other sets of researchers have worked independently for decades on this problem and have identified almost same five factors. Tupes and Christal were first, followed by Goldberg at the Oregon Research Institute (Saucier & Goldberg, 1996). It was Goldberg who coined the phrase "the Big Five" in a review of another research. Costa and McCrae also started work on this subject around the same time at the National Institutes of Health. Their years of research evolved into a similar five factor theory (McCrae & Costa, 1997).

The five all encompassing traits or Big Five are Neuroticism, Extraversion, Openness, Agreeableness, and Conscientiousness (John & Srivastava, 1999). Openness is related to being inventive/curious verses consistent/cautious. Conscientiousness measures if an individual is efficient/organized as opposed to being easy-going/careless. Extraversion measures if an individual is outgoing/energetic or solitary/reserved. Agreeableness is related to be being friendly/compassionate verses challenging/detached. Neuroticism is related to sensitivity/nervousness as opposed to being secure/confident/emotionally stable.

As the matter stands currently, there is broad support among researchers to use the Five Factor Theory of McCrae and Costa to understand personality traits. Five-factor model of personality is the most basic and most advanced model established for the human personality within academic and all main branches of applied psychology (Gill & Hodgkinson, 2007). This stability and academic trust in Big Five made it an automatic choice for our research. We used Big Five personality model based on John and Srivastava's research (John & Srivastava, 1999). The model provides a 44-item questionnaire to evaluate scores on each of the five personality traits and is readily available in multiple languages.

2. Introduction

Personality is among the core factors that dictate any kind of behavior. There has been considerable literature on the effect of personality on outcomes in education, labor market and health. Mary Silles provides compelling evidence that demonstrates social maladjustment (aggressiveness, withdrawal, anxiety) scores are strongly associated with success and failure in education and the labor market (Mary Silles, 2010). Infact, results indicate that non-cognitive skills influence not only schooling outcomes but also wages and career promotion, even after controlling for a variety of behavioral characteristics in addition to economic variables (Lee & Ohtake, 2012).

Stormer and Fahr find that personality affects work attendance in different ways for different groups (Störmer & Fahr, 2013). They find clear negative correlations between the absence probability and conscientiousness among women. For male employees, a negative correlation with the incidence of absence is observed for the agreeableness dimension. Research also finds a negative influence of extraversion on continuance commitment, which leads to the assumption that potential negative consequences of absence are valued less (Erdheim et al., 2006). On the other hand, a significant positive influence of agreeableness on normative commitment is found (Erdheim et al., 2006). Thus, agreeable people might feel a greater obligation to come to work. In another research, McCrae concluded that if workers scoring high on openness end up in a workplace which is characterized by routine, boredom at work and a low degree of autonomy, their absence rates might be higher (McCrae, 1996).

Personality also affects health directly and indirectly in many ways. Childhood agreeableness, conscientiousness and intellect/imagination influence adult health status indirectly through educational attainment, healthy eating habits and smoking (Goldberg et al., 2007). Chiteji verifies that non cognitive skills are positively associated with good health behaviors and negatively associated with bad behavior (Chiteji, 2010).

The literature discussed so far clearly outlines importance of personality in context of well being and personal/economic growth of an individual. Hence, it's quite critical to understand as much as possible about personality and how different factors affect it.

Literature shows that average personality changes are small and do not change substantially over four years (Cobb-Clark & Schurer, 2012). Cobb and Schurer also evaluate effect of shocks on personality. They conclude that reporting eight or more adverse health-related events is associated with a small decrease in men's emotional stability and conscientiousness. They also find that family related events have little relationship with personality change. Moreover, the change in personality due to health or family related shocks is not too big in terms of standard deviation. Hence, we can say intra-individual personality change is generally unrelated to experiencing adverse life events. Our paper would contribute to this literature on shocks and personality by looking at effect of climate and aid.

Climate is another important factor that has been proven to affect human behavior. Deviations from normal precipitation and mild temperatures systematically increase the risk of conflict, often substantially (Solomon et al., 2013). We also know 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) or human productivity (Hsiang 2010; Graff Zivin and Neidell 2013). There is also literature that shows a positive and increasing relationship between temperature and aggravated crime that moderates beyond temperatures of 80°F and then turns negative beyond 90°F (Gamble & Hess, 2012). Hence, the question remains if conflicts and crimes are entirely a response to socio-economic conditions or direct effect of climate on personality. In this paper, we evaluate if climate directly affects personality traits. We evaluate effect of extended periods of drought conditions on personality.

Another important area that remains unexplored is of evaluating personality traits in ultra poor. Most of the studies regarding factors affecting personality or personality affecting outcomes are based on literate, urban population. We know that personality is not consistent across borders and cultures. In Japan, agreeableness and openness to experiences are consistently correlated with educational attainment, whereas in the US, conscientiousness and emotional stability explain much of the variation in the educational attainment (Lee & Ohtake, 2012). Even though Japan and US are both developed societies, we see a variation in factors affecting personality traits. Hence, it would not be wrong to conclude personality would react differently to different shocks between urban population in US and ultra poor in Africa. This paper answers this question by looking at personality traits of randomly selected ultra-poor individuals across rural Uganda and presents results on how their personality reacts to positive and negative events.

In development context, we have thousands of organizations working to uplift the poor. However, we still don't have statistically significant results on how aid and support programs affect personality in poor. Our experimental design allowed us to evaluate the effect of aid/support on personality in poor. The results are an important addition to economics of hope and sheds light on short term effects of positive shocks on personality.

Literature discussed in this section depicts importance of personality in various aspects of life and gave us a good perspective on why it is critical to understand events that affect personality. We also discussed issue of scarce literature on personality of the poor. It would be beneficial to see how positive and negative events affect personality in poor. Hence, the bigger goal of this paper is to understand how environmental events and income changes through aid affect personality in poor. We used drought conditions as a negative shock and evaluate its effect on personality. Our treatment group also got support in the form of income generating assets and life training. This was used as a positive shock and used to evaluate the effect of positive events on personality.

3. Research Design

3.1 Hypothesis
Our research attempts to test following null hypothesis.

a) Positive shock: effect of aid/support

As we mentioned before, there is scarcity of literature to understand effect of aid on personality. This research attempts to fill this gap. Our treatment group got support in form of income generating assets and life skills training. Our null hypothesis is following,
"Support in form of assets or training has no effect on any of the personality traits in ultra-poor".

b) Negative shock: effect of climate

We also explored direct effects of climate on personality. Drought conditions over an extended period of time has large economic effects which indirectly effects social unrest and human

behavior (Schlenker and Roberts 2009). It made for a good case to test for direct effects of drought conditions on personality. We tested against following null hypothesis,

"Drought conditions prevailing at least a month have no effect on any of the personality traits in ultra-poor".

3.2 Experimental Setup

The experiment was conducted across rural Uganda. We selected the following five districts due to high prevalence of poverty: Bombo, Bweyale, Luwero, Zirobwe and Kigumba. Over 271 villages across these five districts were randomly divided into treatment and control. Dividing villages into treatment and control group was done to avoid any spillovers.

We had to identify the ultra poor in various steps because extreme poverty can be a matter of relative theoretical perception. A multi level verification was done before categorizing any individual as "poorest of poor" or "ultra poor". Identification started with 2004 national census data available for targeted districts - Luwero, Bombo, Zerobwe, Kigumba and Bweyale. From this census data, we identified about 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 mathematical value on household's living standard. Based on poverty score card, poorest 2400 individuals were selected for the experiment. 1600 were assigned to treatment and 800 to control. The interviewee did not have to be the head of the household but he or she had to be healthy enough to make use of support/aid and work on any income generating activities.

The intervention for this study was part of an ultra poor graduation program organized and funded by a non profit organization, Bangladesh Rural Action Committee (BRAC). The graduation program is a two-year long program ending in June 2019. Beneficiaries were monitored and given support in various different ways along the length of the program. The ultimate aim is to ensure beneficiaries move above poverty line and are out of risk of falling back into poverty trap. Although there are multiple interventions spanning two years, we looked at the effect of only following two interventions. Our personality surveys were done two weeks after these two interventions were completed.

Income Generating Assets:

Every individual was given an income generating asset as a new source of income. Beneficiaries were given a choice to pick any one type of assets between chickens, pigs and goats. The final decision on which assets to give to someone took into consideration beneficiary's preference, physical capacity in terms of land available and amount of time beneficiary agreed to commit. Beneficiaries were also given two bags of potato vines to smooth out their food consumption until income generating assets kicked in.

Training:

Assets Training: This was training on management of selected asset, that is, how to raise and take care of chickens/goats/pigs. It was a group training session where treatment individuals from two to three neighboring villages were gathered and trained in a social spot such as school.

Financial literacy training: Similar to assets training, it was a group training session to talk about basic household finance management. Trainers also discussed 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 priorities.

3.3 Data

We used data aggregated by Hydrology Research Group at Princeton University. The data combines data from various sources to calculate drought index based on VIC hydrology model. The data is in 0.25° * 0.25° grid format, that is, we have climate data for each 0.25° * 0.25° geographical area. We used daily averages of drought index for our research.

The baseline survey was held a month before treatment and involved collecting data regarding family, household, employment, consumption, assets, health and various other facets of life of interviewee. Survey was in digital format and enumerators were asked to enter the details directly into a mobile app. The app used mobile's GPS location to record exact coordinates of the place where survey was done.

The personality surveys were done in another round of interviews. This was done two weeks after income generating assets were distributed and trainings were given. We used a 44 item questionnaire to evaluate Big Five traits as modelled by John and Srivastava (John & Srivastava, 1999). Uganda is a multi lingual country. Hence, we had to convert the personality test into multiple different languages. To avoid discrepancy in translation, a group discussion was held involving all the enumerators to go through each question. This ensured consistency among different translations of same question. After discussion with enumerators, we decided to drop 7 questions from 44 item survey since they seemed redundant. The redundancy was due to lack of vocabulary/nuances in local language to adequately differ some of the questions from others. Hence, our personality traits scores are based off 37 questions.

Although 1600 individuals were given treatment, we were able to reach only about 700 for personality surveys due to lack of resources. Data cleaning and matching process further reduced the list to 591 individuals. Similarly, out of 800 assigned to control group, we were able to reach only 500 and data cleaning reduced the list to 390 individuals. Data cleaning drop outs were mainly due to enumerator interviewing wrong person in household or names/districts/ids not matching across baseline survey and personality survey. We used observations for individuals for which we have data in both round of surveys. Hence, for this paper, we would be considering 591 individuals for our treatment group and 390 for control group.

Due to lack of resources, we conducted personality surveys over phone. Hence, we were not able to track exact location of the interviewee at the time of personality survey. This brings a small uncertainty in our study. When we match climatic conditions to interviewee, we use GPS coordinates from baseline survey and not the personality survey. In a way, we assume, any individual did not move or change houses after baseline surveys. We assume this only for control group individuals. There was regular contact with treatment group individuals. Hence, we know that they did not move to a new location. 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. For an individual to travel enough so it experiences different conditions would mean changing districts, not just villages. Since, interviewees are ultra poor, probability of them moving to a new district is too low. Hence, we confidently assume that there wont be more than handful such cases in our control group.

3.4 Emperical Design

Dependent Variable

Openness/Conscientiousness/Extraversion/Agreeableness/Neuroticism: Our dependent variable is the score on each personality trait. It takes a continuous value between one and five for each personality trait based on our personality questionnaire. We evaluate effect of our controls on each of these personality trait scores.

Independent variables:

Treatment: A binary variable with value one for individuals who got the treatment and zero otherwise. As mentioned above, treatment refers to someone getting support in form of income generating assets and training sessions. Every individual in treatment group gets both assets and training.

Drought: A binary variable with value one indicating a severe drought in the month before the personality survey. We use daily drought index values based on VIC hydrology model to calculate a monthly average of severity of drought. In a VIC hydrology model, a drought index is percentile severity of drought relative to previous years. Hence, the index range is between 0 and 100. As per standard practice, we assume drought index value of 20 or lower as a severe drought (Sheffield et. al., 2014).

Other independent variables:

Enumerators: Although we extensively discussed each question in a group discussion with enumerators. Due to low literacy rate of interviewees, questions had to be rephrased occasionally to ensure interviewees understood them correctly. Each enumerator explained questions using different examples and sometimes interpret answers when a direct option was not chosen. Each enumerator had a different way of explaining the question and interpreting the answers. Hence, to control for such difference in enumerator-interviewee interaction, we added dummies for each enumerator.

Working members in the family: Number of income sources or working members to support the family changes amount of pressure on an individual to support his family. In the long term, it could affect personality or an individual's way of life. This variable also acts as a proxy for well being and economic status of the family.

Household head unemployed: Just as number of working members in family, a non earning household head changes amount of pressure on an individual to support his family. Since, an individual's personality should not affect employment status of household head, it is safe to control for this factor.

Age and gender: Past literature has shown personality differs based on age and gender (Störmer & Fahr, 2013). Moreover, personality does not dictate age and gender.

We have stayed away from including any controls that are effected by personality such as education level. Adding a control for education is certain to produce biased estimates since personality dictates commitment (Störmer & Fahr, 2013). Non cognitive skills also affect eventual educational outcomes (Lee & Ohtake, 2012).

Fixed effects:

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 used DBSCAN algorithm for clustering villages. DBSCAN clusters a spatial data set based on two parameters: a physical distance from each point and a minimum cluster size. We kept minimum cluster size at 1 and physical distance to 3km. Hence, any two villages within 3kms of each other could potentially be in same cluster. We controled for fixed effects at cluster level where cluster refers to groups formed using DBSCAN algorithm. Although, 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.

Our dependent variable is a continuous non-censored variable. Hence, we can't use any of the limited dependent variable empirical models like multinomial or ordered logit/probit. We use standard OLS fixed effects estimation with following empirical model.

$$p\_trait_{ki} = B_0 + B_1*treatment_i + B_2*drought_i + B_3*age_i + B_4*female_i + B_5*hh\_head\_unemployed_i +$$
$$B_6*working\_members\_in\_family_i + \sum j \; B_{7j}*enumerator_{ij} + a_m + u$$

where,

i: represents an individual in treatment/control

j: represents an enumerator

k: represents one of the personality traits

   i.e Openness, Conscientiousness, Extraversion, Agreeableness or Neuroticism

a_m: represents fixed effects at cluster level

p_trait_{ki}: score on personality trait k for individual i

4. Summary Statistics

As mentioned before, we had 591 individuals in our treatment group. These 591 individuals are spread across 191 distinct villages spread. We had 390 people in control group spread across 95 distinct control villages. All treatment and control villages were divided among five different districts of Uganda. As shown in table 1, proportion of males and females were about same in treatment and control group. We also see that average age and education of individuals was about same in treatment and control. Another important parameter depicting average well being of selected households is household head being unemployed. We see proportion of such households was about same between our treatment and control group.

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.

The sample distribution and sample mean of personality trait scores are given in figure 1 and table 2. In table 2, 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.

5. Results

We tested for internal consistency of personality trait scales using cronbach's alpha. A rule of thumb says any score above 0.70 is a good score. We get a score of 0.49, 0.12, 0.77, 0.59 and 0.64 for Openness, Conscientiousness, Extraversion, Agreeableness and Neuroticism respectively. This is consistent with other similar studies which find alpha scores lower than 0.70 with relatively uneducated sample population (Gurven et. al., 2013). As expected, we see higher reliability of personality scores with more educated sample population, that is, cronbach alpha scores of more 0.70 (Schmitt et. al., 2007).

Effect of Treatment

Tables 3 to 7 show effect of treatment on all personality traits. Results in Table 3, 5 and 7 tell us that there is no statistically significant effect of treatment on openness, extraversion and neuroticism. Table 4 shows that after controlling age, gender, enumerators and cluster level fixed effects, treatment increases conscientiousness in both genders. The result is statistically significant at 1% level and the magnitude of effect is 0.07 which 12% of standard deviation in distribution of conscientiousness scores. The effect remains statistically significant even after controlling for working members in the family, household head being unemployed and for each gender separately. Treatment also increases agreeableness in men. The result is statistically significant at 1% level and magnitude increases by 0.11 which is 23% of the standard deviation in distribution of agreeableness scores.

Tables 3 to 7 also present results on effect of drought on all personality traits. Results in Table 4 show that a month long drought decreases conscientiousness by 0.14 points. The result is significant at 1% level and is equivalent to 24% of standard deviation in conscientiousness score distribution. The result prevails even after controlling for working members in family, household head being unemployed and for each gender separately.

Results in Table 6 tell a similar picture for effect of a month long drought on agreeableness. A month long drought decreases agreeableness by 0.10 points. The result is significant at 5% level and is equivalent to 21% of standard deviation in agreeableness score distribution. We also see drought affecting neurotic behavior and openness in men. We can see that neurotic scores increase by 0.10 and openness scores decrease by 0.05 for men after a month long drought.

We also evaluated effect of two months long drought. There were 268 individuals living in areas which experienced drought conditions for atleast two months. Results for effect of a two months long drought are similar to the one discussed above for a month long drought. The results for two months long drought are reported in Tables 3 to 7.

Our sample had 104 individuals living in areas that experienced three months long drought. Our regression results show there is a negative effect of drought on all personality traits but none of it is not statistically significant at 10% level. We believe that lack of power in our sample, that is, low number of people experiencing a three months long drought caused failure to capture a statistically significant effect.

6. Conclusion

In this paper, we looked at a roll out of an ultra-poor graduation program and analyzed its effect on personality immediately after asset distribution and training. We also looked at climatic conditions during months leading up to the roll out and evaluated effects on personality. We saw that aid/support increases conscientiousness in both genders and increases agreeableness in men. This is an important finding since past literature does not say anything about how any intervention affects

any of the big five personality traits in poor. It is encouraging to find that aid not only improves physical well being but also mental well being of beneficiaries. Since, personality affects virtually every outcome in someone's life, promoting efforts that positively effect personality would be of great help in long run.

We also see 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 mental well being. Our paper sheds light on how interventions and environment influences personality in poorest of poor. Due to strong effects of personality on various life outcomes, any intervention designed to improve personality would have a multiplier effect on an individual's life and well being. It is critical that development programs focus on personality as much as on economic status of an individual. The results from this paper could be used in future research to design programs that have positive influence on personality. Positive impact on personality could mitigate not only short term, but also long term economic problems.

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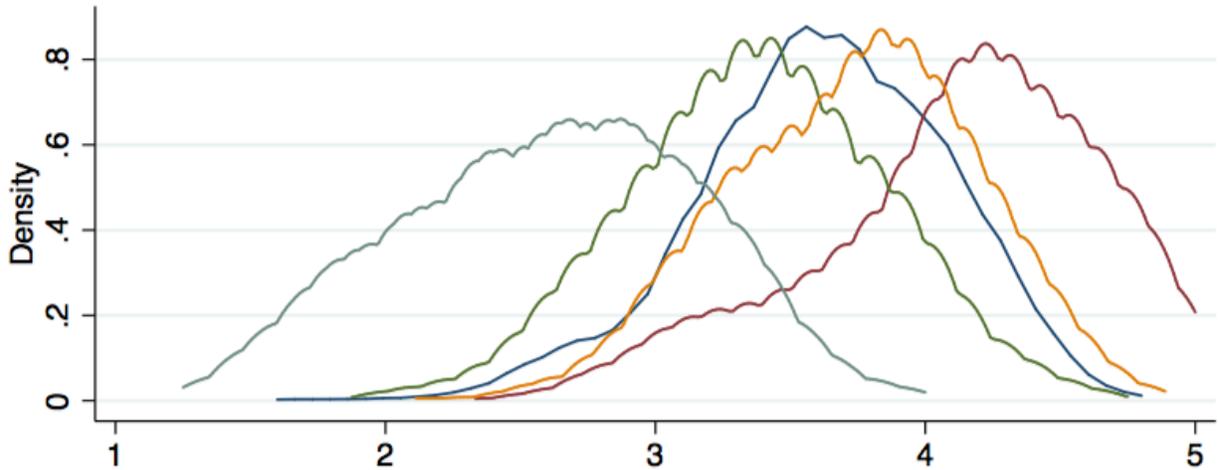
Figure 1: kDensity distribution of personality traits scores of our sample population.

Blue: Openness, Red: Conscientiousness, Green: Extraversion,

Yellow: Agreeableness, Gray: Neuroticism

	Treatment	Control
Total individuals	591	390
Total villages	160	76
% Male	54.99%	55.12%
% Female	45%	44.87%
% Individuals with Household head unemployed	41.02%	47.71%
% Individuals that experienced month long drought	73.77%	45.38%
% Individuals that experienced 2 months long drought	31.30%	21.28%
Age (On average)	24.7	23.79
Number of Working Members in family (On average)	0.75	0.83
Education (On average)	8.39	8.03

Table 1: Summary Statistics

	Rural Uganda	Africa	North America	Eastern Europe
Openness	3.4	3.61	3.72	3.72
Conscientiousness	4	3.72	3.61	3.75
Extraversion	3.3	3.8	3.42	3.42
Agreeableness	3.7	3.85	3.78	3.53
Neuroticism	2.6	2.75	2.92	2.9

Table 2: Sample means of personality trait scores across different regions.

Means of our sample are in column 1.

	openness	openness	openness (lengthy drought)	openness (lengthy drought)	openness (Only males)	openness (Only females)
treatment	-0.0284	-0.0263	-0.0276	-0.0258	0.00799	-0.0590
	(0.0271)	(0.0280)	(0.0236)	(0.0239)	(0.0302)	(0.0661)
drought	-0.00405	-0.00503			-0.0594**	0.0339
	(0.0492)	(0.0526)			(0.0235)	(0.0988)
long_drought			-0.00786	-0.00764		
			(0.0345)	(0.0371)		
working_members_in_family		-0.0103		-0.0103		
		(0.0133)		(0.0135)		
hh_head_unemploymed		-0.0296		-0.0295		
		(0.0270)		(0.0266)		
female	-0.109***	-0.109***	-0.109***	-0.109***		
	(0.0183)	(0.0180)	(0.0183)	(0.0181)		
age	-0.00351	-0.00379	-0.00350	-0.00379	-0.00648	4.05e-05
	(0.00265)	(0.00262)	(0.00263)	(0.00261)	(0.00486)	(0.00324)
Constant	3.742***	3.772***	3.741***	3.770***	3.766***	3.588***
	(0.0908)	(0.0861)	(0.0922)	(0.0833)	(0.113)	(0.0984)
Observations	981	981	981	981	540	441
R-squared	0.310	0.312	0.310	0.312	0.257	0.403
Number of cluster_id	32	32	32	32	31	28

Table 3. Effect of a treatment and drought on Openness.

OLS Fixed Effects estimation with Personality Trait as Dependent variable.

Controls include dummies for age, gender, number of working members in family, binary variable

for household head being unemployed, dummies for enumerators and fixed effects at cluster level.

Standard errors in parantheses. *** p<0.01, ** p<0.05, * p<0.1

	conscientiousness	conscientiousness	conscientiousness (lengthy drought)	conscientiousness (lengthy drought)	conscientiousness (Only males)	conscientiousness (Only females)
treatment	0.0704***	0.0731***	0.0543**	0.0563**	0.0870***	0.0818**
	(0.0182)	(0.0180)	(0.0235)	(0.0235)	(0.0239)	(0.0381)
drought	-0.144***	-0.145***			-0.133***	-0.194***
	(0.0321)	(0.0347)			(0.0403)	(0.0441)
long_drought			-0.0710*	-0.0707		
			(0.0418)	(0.0446)		
working_members_in_family		-0.0117		-0.0128		
		(0.0108)		(0.0109)		
hh_head_unemploymed		-0.0355***		-0.0335***		
		(0.0117)		(0.0110)		
female	-0.0854***	-0.0851***	-0.0855***	-0.0854***		
	(0.0294)	(0.0301)	(0.0284)	(0.0291)		
age	0.00385*	0.00352	0.00370*	0.00335	0.00609*	0.00324
	(0.00208)	(0.00214)	(0.00209)	(0.00214)	(0.00311)	(0.00323)
Constant	4.351***	4.386***	4.296***	4.331***	4.266***	4.331***
	(0.0733)	(0.0795)	(0.0778)	(0.0826)	(0.0846)	(0.0958)
Observations	981	981	981	981	540	441
R-squared	0.621	0.622	0.619	0.620	0.636	0.625
Number of cluster_id	32	32	32	32	31	28

Table 4. Effect of a treatment and drought on Conscientiousness.

OLS Fixed Effects estimation with Personality Trait as Dependent variable.

Controls include dummies for age, gender, number of working members in family, binary variable for household head being unemployed, dummies for enumerators and fixed effects at cluster level.

Standard errors in parantheses. *** p<0.01, ** p<0.05, * p<0.1

	extraversion	extraversion	extraversion (lengthy drought)	extraversion (lengthy drought)	extraversion (Only males)	extraversion (Only females)
treatment	-0.0203	-0.0245	-0.0148	-0.0184	0.0148	-0.0528
	(0.0304)	(0.0296)	(0.0303)	(0.0301)	(0.0499)	(0.0452)
drought	-0.0358	-0.0332			-0.0726	0.0366
	(0.0294)	(0.0262)			(0.0568)	(0.114)
long_drought			-0.0638*	-0.0643*		
			(0.0321)	(0.0344)		
working_members_in_family		0.00634		0.00607		
		(0.0111)		(0.0113)		
hh_head_unemploymed		0.0438		0.0444		
		(0.0268)		(0.0262)		
female	-0.168***	-0.169***	-0.169***	-0.171***		
	(0.0394)	(0.0390)	(0.0384)	(0.0378)		
age	0.00475**	0.00497**	0.00478*	0.00501**	0.00890**	-0.00233
	(0.00233)	(0.00241)	(0.00236)	(0.00245)	(0.00347)	(0.00430)
Constant	3.503***	3.473***	3.493***	3.463***	3.451***	3.457***
	(0.0825)	(0.0850)	(0.0886)	(0.0906)	(0.114)	(0.117)
Observations	981	981	981	981	540	441
R-squared	0.207	0.208	0.207	0.209	0.215	0.184
Number of cluster_id	32	32	32	32	31	28

Table 5. Effect of a treatment and drought on Extraversion.

OLS Fixed Effects estimation with Personality Trait as Dependent variable.

Controls include dummies for age, gender, number of working members in family, binary variable for household head being unemployed, dummies for enumerators and fixed effects at cluster level.

Standard errors in parantheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

	agreeableness	agreeableness	agreeableness (lengthy drought)	agreeableness (lengthy drought)	agreeableness (Only males)	agreeableness (Only females)
treatment	0.0979**	0.101**	0.0907**	0.0930**	0.113***	0.0938
	(0.0409)	(0.0418)	(0.0440)	(0.0452)	(0.0312)	(0.0688)
drought	-0.109**	-0.112**			-0.147	-0.0537
	(0.0516)	(0.0503)			(0.0904)	(0.0426)
long_drought			-0.0786*	-0.0783*		
			(0.0434)	(0.0446)		
working_members_in_family		0.00748		0.00666		
		(0.00952)		(0.00957)		
hh_head_unemploymed		-0.0197		-0.0181		
		(0.0153)		(0.0154)		
female	-0.0165	-0.0153	-0.0176	-0.0165		
	(0.0159)	(0.0157)	(0.0156)	(0.0153)		
age	-0.00318*	-0.00305*	-0.00326*	-0.00315*	0.000681	-0.00556***
	(0.00186)	(0.00177)	(0.00186)	(0.00178)	(0.00334)	(0.00144)
Constant	3.920***	3.918***	3.880***	3.878***	3.842***	3.925***
	(0.0721)	(0.0689)	(0.0601)	(0.0583)	(0.122)	(0.0562)
Observations	981	981	981	981	540	441
R-squared	0.416	0.417	0.416	0.416	0.404	0.457
Number of cluster_id	32	32	32	32	31	28

Table 6. Effect of a treatment and drought on Agreeableness.

OLS Fixed Effects estimation with Personality Trait as Dependent variable.

Controls include dummies for age, gender, number of working members in family, binary variable for household head being unemployed, dummies for enumerators and fixed effects at cluster level.

Standard errors in parantheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$

	neuroticism	neuroticism	neuroticism (lengthy drought)	neuroticism (lengthy drought)	neuroticism (Only males)	neuroticism (Only females)
treatment	0.0173	0.0220	0.0234	0.0273	0.00992	0.0253
	(0.0201)	(0.0194)	(0.0191)	(0.0179)	(0.0234)	(0.0419)
drought	0.0659**	0.0620*			0.105**	-0.0303
	(0.0301)	(0.0310)			(0.0482)	(0.0873)
long_drought			0.0385	0.0389		
			(0.0296)	(0.0278)		
working_members_in_family		0.0112		0.0117		
		(0.0111)		(0.0111)		
hh_head_unemploymed		-0.0295		-0.0304		
		(0.0373)		(0.0368)		
female	0.128***	0.130***	0.128***	0.130***		
	(0.0265)	(0.0260)	(0.0265)	(0.0259)		
age	0.00360	0.00380	0.00366	0.00386	0.00519*	0.00298
	(0.00247)	(0.00248)	(0.00247)	(0.00247)	(0.00275)	(0.00485)
Constant	2.577***	2.575***	2.602***	2.598***	2.524***	2.779***
	(0.0654)	(0.0843)	(0.0654)	(0.0833)	(0.0603)	(0.127)
Observations	981	981	981	981	540	441
R-squared	0.429	0.430	0.429	0.430	0.483	0.354
Number of cluster_id	32	32	32	32	31	28

Table 7. Effect of a treatment and drought on Neuroticism.

OLS Fixed Effects estimation with Personality Trait as Dependent variable.

Controls include dummies for age, gender, number of working members in family, binary variable for household head being unemployed, dummies for enumerators and fixed effects at cluster level.

Standard errors in parantheses. *** $p<0.01$, ** $p<0.05$, * $p<0.1$