HUMAN CAPITAL AND EMPLOYMENT SUCCESS: THE ROLE OF PERSONALITY TRAITS

by

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Abstract

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Over a long period of time IQ and educational levels were treated to be the main determinants of employment success. The aim of this study is to show that personality traits (patterns of thoughts, feelings, and behaviors) do play an important role in employment status, occupation position, and economic sector choice. Using cross-section data from the STEP survey of the urban working-age population in Ukraine we found out that emotional stability and openness to experience play a key role in explaining probability to be employed, occupy a managerial position, or being employed in a certain industry. Family background factors were shown to be a significant mediator of the relationship between personality traits and employment characteristics. The obtained results might be used for further policy decisions in pre-school, primary, secondary, and higher education as well as in workplace training programs.

TABLE OF CONTENTS

LIST OF FIGURES

Number *Page*

LIST OF TABLES

Number *Page*

LIST OF TABLES - Continued

LIST OF TABLES - Continued

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GLOSSARY

OECD. The organization for Economic Co-operation and Development.

STEP. Skills toward Employment and Productivity.

The most valuable of all capital is that invested in human beings.

Alfred Marshall (1890)

Chapter 1

INTRODUCTION

As the Fourth Industrial Revolution transforms the labor market, the return to non-cognitive skills would seem to ascend. Socio-emotional skills are defined as personality traits or "relatively enduring patterns of thoughts, feelings, and behaviors that reflect the tendency to respond in certain ways under certain circumstances" (Roberts, et al. 2007). Bearing our goals in mind, we use the terms "non-cognitive skills", "socio-emotional skills", "soft skills" and "personality traits" interchangeably in this work.

According to the World Economic Forum 2018, 71% of total tasks across twelve industries covered in the report were performed by humans in 2018, compared to 29% by machines. By 2022 this percentage is expected to shift to 58% and 42% respectively (World Economic Forum 2018).

Jim Yong Kim, the Former President of the World Bank Group also stated that many jobs would not exist in the future and children should acquire such skills as problem-solving and critical thinking, empathy and collaboration that seem likely to help them adjust to rapid changes in the labor market (World Bank 2019).

Broadening the economic concept of human capital to include non-cognitive skills is highly relevant. For a long time, cognitive ability was the main determinant of employment success. Human capital was treated as a set of abilities that help to earn money in early studies (Becker 1964). Many papers studied the role of education in explaining schooling and socio-economic success (Stiglitz 1975, Hanushek, Kain and Rivkin 2004). Personality traits were not considered relevant for predicting important labor market outcomes. Recent research shows a substantial role of both cognitive and non-cognitive skills in

schooling and earnings determination (Heckman, Stixrud and Urzua, 2006). Likewise, a meta-analysis of Roberts and colleagues (2007) showed that non-cognitive skills are almost as influential as cognitive. As for now, human capital can be characterized as "the knowledge, skills, competencies and other attributes embodied in individuals or groups of individuals acquired during their life and used to produce goods, services or ideas in market circumstances" (OECD 2001).

There is a growing amount of literature on the contribution of cognitive skills to earnings, which answer the question "Why people with diverse personality traits are paid differently?" (Almund et al., 2011, Borghans, Heckman and Weel, 2008, Murnane, Willett and Levy, 1995). At the same time, the literature on the predictive role of non-cognitive skills on labor market outcomes, especially in developing countries, is scarce. Psychologists mainly report correlations between non-cognitive skills and outcomes without referring to causation and without controlling for other observable characteristics. This study aims to answer the following question: "How important is each of personality traits in explaining the probability to be employed, being employed in a certain industry or occupy managerial position?" in Ukraine.

This study uses the logit model and a multinomial logit model to estimate the impact of personality traits on employment success among working-age Ukrainians. For this purpose, the World Bank STEP Skills Measurement Household Survey (2012) is used. In addition to standard modules on cognitive skills (reading, writing, and numeracy proficiency) and job-specific skills, it includes a module on socio-emotional skills (personality, behavior, and preferences). Based on the last module eight personality traits are distinguished: The Big Five (openness, conscientiousness, extraversion, agreeableness, and emotional stability), grit, decision-making, and hostile attribution bias. In such a way an important contribution of this paper will be to evaluate the probability of

employment success (measured by the probability of being employed and occupying high-skilled jobs) of an individual having a particular set of personality traits while controlling for socio-demographic characteristics, family background, and family structure. We also extend our research by assessing the probability of being employed in a particular economic sector.

We show that the most relevant personality trait in explaining the probability of employment success is emotional stability, followed by openness to experience. Agreeableness has a positive effect on the probability to be employed in Public services. Extraversion, together with decision-making skills does not affect the labor market outcomes. Conscientiousness is positively associated with employment but doesn't affect the probability of occupying managerial positions, probably because it is required to have a higher than average level of conscientiousness for all levels of job.

Mediating analysis represents that family background factors, such as mother's education, parental involvement in education, high socio-economic status of the family at childhood moderate the relationship between employment characteristics and personality traits.

The rest of this paper is organized as follows. In chapter 2, the literature review is presented. Chapter 3 explains the methodology and shows the data description. Estimation results of logit equations, robustness check, and mediating analysis are discussed in Chapter 4. Chapter 5 summarizes the main findings and discusses possible implications.

Chapter 2

LITERATURE REVIEW

Over a long period of time, personality traits were not considered notably relevant for the marketplace compared to the intelligence of an individual. One of the first references to non-cognitive skills as a component of human capital was made in the 1970s years (Bowles and Gintis 1976), and in the past forty years, it has acquired large popularity in the social and economic sciences.

There is evidence that socio-emotional skills are equally or even more important than cognition in predicting substantial life outcomes, such as earnings, school attainment, crime participation, and risky behaviors (Heckman and Kautz 2012, Roberts, et al. 2007). For example, socio-emotional skills are from 2.5 to 4 times more important in terms of earnings for people with the lowest incomes than cognition (OECD 2015).

Psychologists and economists in many countries profusely studied the relationship between personality traits and employment success. To our knowledge, no prior studies have statistically examined the effect of non-cognitive skills on employment in industry sectors.

Agreeableness is "the willingness to help other people, act in line with other people's interests and the degree to which an individual is co-operative, warm and agreeable versus cold, disagreeable and antagonistic" (Nyhus and Pons 2005). Heineck (2011) using the British Household Panel Survey (BHPS) and OLS with the Five-Factor Model reveals that low agreeableness increased wages, but agreeable individuals benefit from being employed in jobs with a high frequency of customers' interaction. Judge and others (1999) revealed another side of agreeableness, which is that "extremely agreeable individuals may sacrifice their

success in pleasing others". The results from Mueller and Plug (2006), who used data from the Wisconsin Longitudinal Study Using survey, imply that agreeableness is negatively associated with earnings. However, Nyhus and Pons (2005), using Dutch data from the DNB Household Survey (DHS) report such effects for women only.

Conscientiousness is "the degree to which a person is willing to comply with conventional rules, norms, and standards" (Costa and McCrae 2008). It is an important predictor of occupational as well as educational attainment (Borghans, Heckman, and Weel 2008, Brunello and Schlotter 2011). Being related to grit, conscientiousness is also defined as "perseverance and passion for long-term goals" (Duckworth, et al. 2007). Numerous studies establish that conscientiousness is positively linked with wages since it is associated with responsibility and high labor productivity (Barrick and Mount 1991, Nyhus and Pons 2005, Almund, et al. 2011).

Emotional intelligence is characterized as "the ability to monitor one's own and others' emotions, to discriminate among them, and to use the information to guide one's thinking and actions" (Mayer, DiPaolo, and Salovey 1990). Inverse to emotional stability, neuroticism is a property of being "tense, anxious, or moody" (Costa and McCrae 2008, Hogan, Barrett and Hogan 2007). Neuroticism is also described as an inability to cope well with stress (Schmitt, et al. 2007). Neurotic individuals have lower wages (Bowles and Gintis 1976, Heckman, Stixrud and Urzua 2006), are less likely to be employed (Uysal and Pohlmeier 2011), have poor task performance (Gardner and Cummings 1988) and job satisfaction (Nyhus and Pons 2005), and have a lower probability to occupy high-level jobs (Spector, Jex and Chen 1995).

Extraversion is explained as "the preference for human contacts, empathy, gregariousness, assertiveness and the wish to inspire people" (Brunello and Schlotter 2011). The effect of extraversion on employment success is ambiguous. On one hand, it is associated with higher wages and increases the probability to be employed (Bode, et al. 2016). Extraversion is also associated with successful entrepreneurship (Stuetzer, et al. 2018). On the other hand, some papers didn't find any evidence of the impact of extraversion on labor market outcomes (Del Carpio, et al. 2017, Nyhus and Pons 2005, Mueller and Plug 2006).

Openness to experience is "the degree to which a person needs intellectual stimulation, change, and variety" (Costa and McCrae 2008). Openness is positively associated with earnings of both males and females (Nyhus and Pons 2005, Mueller and Plug 2006), and high-level jobs (Barrick and Mount 1991). However, Seibert and Kraimer (2001) using hierarchical regression found that higher openness is negatively associated with wage.

Despite the rich literature on personality traits' effect on labor market outcomes, very few research papers have been investigating these effects for Ukraine and other post-soviet countries. Del Carpio et al. (2017) using The STEP Skills Measurement Survey for Ukraine find that personality traits, demographic, and family characteristics significantly correlate with labor market outcomes. Specifically, grit and conscientiousness are associated with higher wages and managerial positions; people with higher emotional stability are more likely to be employed; openness to experience is associated with higher occupational status and there is no effect of extraversion on the labor market outcomes.

Cognitive skills, extraversion, emotional stability, and empathy had no statistically significant effect on occupational attainment in Moldova (Kupets, Levin and Smolyar, 2019). For females, the most important predictor of being employed is

emotional stability. Empathy is statistically significant in men's participation in the labor force. However, agreeableness and openness are also important in Mincer regression that excludes education.

Rozhkova (2019) also estimated the Mincer equation using the Russian Longitudinal Monitoring Survey (RLMS) and found that conscientiousness, decision making, and creativity were associated with high earnings; extraversion, openness, emotional stability, hard-working and "thinking out of the box" resulted in high-level jobs. The author also found that extraversion and openness were rewarded while agreeableness and neuroticism are fined.

Overall, the findings suggest that personality traits are important determinants of labor market outcomes as well as health and criminal behavior in adulthood and that the results vary by countries. For instance, the different effects of agreeableness and extraversion on wages were observed. The findings also highlight the substantial role of emotional stability and openness in the probability to be employed at high-level jobs, extraversion – in the probability to be self-employed.

Chapter 3

DATA DESCRIPTION AND METHODOLOGY

The connection between non-cognitive skills and labor market outcomes derived from the literature can be expressed in five hypotheses (Table 1).

Table 1. Summary of hypotheses

	Employed	High-level job	Sector
Extraversion	+	+	Extroverts are more likely being involved in jobs with social interaction and teamwork (Public and Business services)
Agreeableness	-	-	Agreeable individuals are more likely to be involved in Public services
Conscientious-ness	+	+	Positively affects the probability to be employed in the Business and Public services
Emotional stability	+	+	Ambiguous
Openness	+	+	It is expected that Openness positively affects the probability to be involved in creative jobs (Business services)

3.1 Methodology

The objective of this research is to estimate the predictive power of personality traits for the probability to be employed, occupy managerial position, and being employed in a particular industry.

The basic logistic regression used to compare results with the previous empiric literature takes the following form (for the formal model description see (Wooldridge 2016):

$$P(employed = 1) = \frac{e^{X\beta}}{1+e^{X\beta}} \quad (3.1)$$

$$X\beta = \boldsymbol{D}_i\boldsymbol{\beta}_1 + \boldsymbol{C}_i\boldsymbol{\beta}_2 + \boldsymbol{P}_i\boldsymbol{\beta}_3 + \boldsymbol{F}_i\boldsymbol{\beta}_4, \quad (3.2)$$

where $\boldsymbol{D}$ stands for demographic and other individual characteristics, $\boldsymbol{C}$ stands for cognitive skills and education level, $\boldsymbol{F}$ for the family background and $\boldsymbol{P}$ for socio-emotional skills for the *i*th individual. The dependent variable (*employed*) is binary (1 if employed, 0 if unemployed). All variables that are used for regressions are described in Table B - 1, descriptive statistics of the dependent variables are shown in Table B – 2, and independent variables – in Table B – 3. For more details about variables' generation please see (Pierre, et al. 2014).

The multinomial logit model was considered as the most appropriate for the dependent variables *occupation* and *sector* since they have more than two categories. For the *occupation* model, we compared the log-likelihood for the ordered logit regression and the multinomial logit. A likelihood ratio test showed a probability of 0%, which means that simplification from multinomial logit to ordered logit is rejected. Moreover, the ordered logit model uses the proportional odds assumption (Long 1997). The assumption is that the effects of explanatory variables are consistent across the levels of the dependent variable. Based on a

Brant test* we would conclude that this assumption is violated since the chi-square test was significant, which means that at least one variable violates the assumption. Thus, we will fit a less restrictive model – a multinomial logit model.

We tested the independence of irrelevant alternatives (IIA) assumption for the multinomial logit models, following (Hausman and McFadden 1984). In particular, we applied a suest-based Hausman test, which provides strong evidence towards independence of irrelevant alternatives in the sample since we cannot reject H_0 of independent alternatives at the one percent level (Tables 2 - 3).

Table 2. Suest-based Hausman tests of IIA assumption for the multinomial logit model (dependent variable: *Occupation*) (N=1027)

	Chi2	df	P>chi2
High-skilled	30.45	50	0.99
Skilled non-manual	37.93	50	0.90
Skilled manual	50.91	50	0.44
Elementary	33.34	50	0.97

Table 3. Suest-based Hausman tests of IIA assumption for the multinomial logit model (dependent variable: *Sector*) (N=1025)

	Chi2	df	P>chi2
Agriculture	26.56	75	1.00
Industry and construction	50.66	75	0.99
Trade, Transport, Accommodation, Other Services	46.28	75	0.99
Public Services	25.37	75	1.00
Business Services	30.99	75	1.00

*We used svy gologit2 command with pl (constrains all variables to meet the assumption) and npl (relaxes the assumption for all explanatory variables) specifications.

The probability of working at a particular occupation, given the value of the explanatory variables can be estimated as:

$$P(O_j = 1) = \frac{e^{X\beta}}{1+e^{X\beta}} \quad (3.3)$$

Where *j* = {high skilled; skilled non-manual; skilled manual; elementary}. There are nine occupational groups according to ISCO-88 in the original dataset. Following Kupets, Levin, and Smolyar (2019), they are grouped into 4 broad skill categories to overcome small cell percentage problems (some occupations took less than 3% in the original dataset). The high-skilled occupation is the baseline comparison group.

In the third model, we use a multinomial logit to comprehend how the individual's personality traits affect the probability to be employed in a particular economic sector:

$$P(S_k = 1) = \frac{e^{X\beta}}{1+e^{X\beta}} \quad (3.4)$$

Where *k* = {agriculture; industry and construction; trade, transport, accommodation, other services; public services; business services}. We have chosen to use Public Services as the baseline category for the sector.

All regressions control for socio-demographic characteristics and foundational cognitive skills, such as reading and numeracy skills (not including them will lead to upward-biased estimates of our key variables).

We made two stages of the analysis. In the first one, we control for mother education, parental involvement in children education, the number of children under six, siblings at age of twelve, socio-economic status at age of fifteen, a dummy for facing economic shocks at age of fifteen, following Kupets, Levin, and Smolyar (2019). We focus on the mother's background since mothers remain the primary caregivers when the personality traits of children are forming. As mentioned in the Literature review section, personality traits might change in response to parental investment. Thus, in the second step, we do assume that the above-mentioned family environmental factors serve as mediators in the relationship between personality traits and employment outcomes.

A particular advantage of the STEP survey is that it uses the Final Comprehensive Person Weight adjusted for gender and age groups (The World Bank 2014). We estimated all the equations using survey package, thus, our results are corrected for the unequal probabilities of the sample selection, household, and individual non-responses and adjusted for age, gender, and region weights.

3.2 Potential issues

Examining the relationship between personality traits and labor market outcomes often includes endogeneity (potential reverse causality issue) as labor market outcomes affect personality traits, which then again may affect labor market outcomes via productivity differentials. Among the first economists who tried to deal with endogeneity were McCrae and Costa (1994), who suggest that individuals' personality traits are formed in early childhood and during schooling by parental background and environmental factors and remain relatively stable in adulthood. First, our data sample excludes individuals aged less than 25 years (347 observations) for all of the analysis to get rid of the possibility of changing personality traits in response to employment characteristic or other factors'

changes, following (McCrae and Costa 1994, Kupets, Levin and Smolyar 2019). Moreover, we assume that the significance of reverse causality is small since personality traits are either genetically inherited (Jang, Livesley and Vemon 1996), or formed by culture (Schmitt, et al. 2007).

Second, a multivariate probit framework is used, which uses simulated maximum likelihood simulation by calculating a probability for each replication and then deriving the average (see Greene 2000 for more details). In the case of employment, the model can be specified as follows:

$$\begin{Bmatrix} Employed = \boldsymbol{D}_{i1}\boldsymbol{\beta}_{i1} + \boldsymbol{C}_{i1}\boldsymbol{\beta}_{i1} + \boldsymbol{F}_{i1}\boldsymbol{\beta}_{i1} + \varepsilon_{i1} \\ P_1 = \boldsymbol{D}_{i2}\boldsymbol{\beta}_{i2} + \boldsymbol{C}_{i2}\boldsymbol{\beta}_{i2} + \boldsymbol{F}_{i2}\boldsymbol{\beta}_{i2} + \varepsilon_{i2} \\ \dots \\ P_6 = \boldsymbol{D}_{i7}\boldsymbol{\beta}_{i7} + \boldsymbol{C}_{i7}\boldsymbol{\beta}_{i7} + \boldsymbol{F}_{i7}\boldsymbol{\beta}_{i7} + \varepsilon_{i7} \end{Bmatrix}, \quad (3.5)$$

Where P_1-P_6 are standardized personality traits from the original data sample, converted to binary variables (1, if the individual has above the mean score and 0 if below), ε is the error term. The same vectors of explanatory variables are used in each equation according to Greene (2000) - $\boldsymbol{D}$, $\boldsymbol{C}$, and $\boldsymbol{F}$ described in Table B - 1.

One of the underlying assumptions of the multinomial logit model is that error terms of all seven regressions are mutually exclusive (Greene 2003). In fact, it could be incorrect since random error components of employment choice and personality traits might be correlated. Multivariate probit allows for possible correlation of employment status and having particular non-cognitive skills simultaneously. To test for this possibility, pairwise correlation in the variance-

covariance matrix of cross-equation error terms is used. Such a framework is also used for *occupation* and *sector* variables.

Third, we used the approach of getting net effects of personality traits from age, following (Heineck and Anger 2010, Osborne Groves 2005). We used two different sets of personality traits in the regression analysis: the one is from the original dataset and the other one is regression-corrected skills:

$$P\,(\boldsymbol{P}i) = \beta_0 + \beta_1 age + \beta_2 age^2 + \beta_3 age^3 + u_i \quad (3.6)$$

$$P\,(\boldsymbol{P}i) = \beta_0 + \beta_1 age + \beta_2 age^2 + \beta_3 age^3 + \beta_3 gender + u_i \quad (3.7)$$

Where *Pi*s are individual personality traits from Table B - 3. We used predicted residuals from the regressing each of socio-emotional skills on age, age squared, and age cubed (and for *gender* for the whole population).

Results from estimated equations should be interpreted with caution because of the measurement error, which is typically present in surveys, where the units of analysis are individual respondents and households. Personality traits are difficult to measure and measurement error could lead to the attenuation bias and low statistical power. The variability of personality dimensions often is quantified using Cronbach's alphas (Cronbach 1951).

"Extreme response bias" and "middle response bias" may be corrected by standardizing the standard deviations of responses (Nomura and Adhikari 2017, Laajaj, et al. 2018). All personality traits are standardized for the analysis to have a mean of 0 and a standard deviation equal to 1, as is shown in Figure B - 1.

Even though we control for several variables that may proxy for some unobservable characteristics in our dataset, our results may be still upward biased by omitted variables that are correlated with labor market outcomes and personality traits. We leave this issue for future research when more comprehensive data on Ukraine becomes available.

3.3 Data Description

For estimating the impacts of non-cognitive skills on employment success, we use the cross-sectional dataset with the individual and household-level data from the World Bank STEP (Skills Towards Employment and Productivity) Measurement Household Surveys for Ukraine 2012. Individual respondents, who are "non-institutionalized persons living in private dwellings in urban areas of the country at the time of data collection", were randomly taken from households. The overall response rate of the questionnaire is 61% (Pierre et al. 2014).

The original sample consists of 2389 observations for urban residents aged 15-64 years. It provides detailed information on demographic characteristics, labor market status, skills, preferences, and behaviors, the structure of the household, housing conditions, income, and assets. The stratification design method was applied, by using 26 strata, including the Autonomous Republic of Crimea, Kyiv, and 24 regions (The World Bank 2014). By restricting our sample to adults aged more than 25, we end up with 2042 observations. According to Table 4, Table B - 2 and Table B - 3 there are some missing observations for dependent variables as well as for predictors, so we might expect a lower number of observations in our models.

We consider the Big Five - a broadly accepted system of personality traits, which includes Openness to Experience, Conscientiousness, Extraversion,

Agreeableness, Neuroticism (inverse to Emotional stability) (Nyhus and Pons 2005). The Big Five, originally developed by Robert McCrae and Paul Costa, represent a widely accepted, comprehensive frame, which is validated by numerous empirical studies (McCrae and Costa 1994, Lang, et al. 2011, Laajaj, et al. 2018). Three more traits derived from the STEP survey include grit, decision making, and hostile bias.

Since extensive psychological questioning is not practicable in large-scale surveys, the STEP Measurement program provides a set of twenty-four questions on personal behavior. Answers are given on a Likert-type 4-point scale: 1 – "Almost never", 2 – "Some of the time", 3 – "Most of the time" and 4 – "Almost always". The scale is reversed to 1 – "Almost always", 4 – "Almost never" for negatively scored items. All "Don't know" answers are recorded as missing values (Pierre, et al. 2014). The mapping of personality traits with original questions is shown in Table A - 1. The individual scores for 8 personality traits are calculated by the STEP team as simple averages of individual's responses to the corresponding questions.

Descriptive statistics of the main personality traits used in the analysis are presented in Table 4. Since we observe responses to the non-cognitive skills module only in 2012, we assume them to be time-invariant.

Table 4 also shows the results for the overall internal reliability for each of the instruments – Cronbach alpha. Item-test correlation suggests that excluding hostile bias increases alpha value. We find alpha reliability varies between 0.59 (for the Openness) and 0.73 (for the Emotional stability) because of the relatively small number (three) of items (Pierre, et al. 2014). It is satisfactory for further analysis according to Hair (2006). The scale reliability coefficient is 0.67, which is acceptable (Gliem and Gliem 2003).

Table 4. Descriptive statistics of socio-emotional skills (non-standardized)

	N	Min.	Max.	Mean	Std. Dev.	Alpha Cronbach
Extraversion	2,032	1	4	2.66	0. 61	0.68
Agreeableness	2,031	1	4	2.92	0.57	0.61
Conscientiousness	2,031	1	4	3.04	0. 49	0.62
Emotional stability	2,030	1	4	2.53	0.65	0.73
Openness	2,031	1	4	3.07	0.55	0.59
Decision Making	2,031	1	4	3.12	0.55	0.60

Source: author's calculations, STEP Household Survey Ukraine, 2012

As mentioned in the Methodology part, we control for both cognitive and socio-emotional skills (Table B-1), hence, a correlation matrix should be made in order to determine which variables should be excluded from the regression. For instance, a slight significant positive correlation could be observed between openness and extraversion, and negative between neuroticism and conscientiousness (Almund, et al. 2011).

From Table B-4 one can see the examination of bivariate correlations. They are shown to be either small or moderate, which is consistent with the previous research (Lang, et al. 2011, Heckman and Kautz 2012, Barrick and Mount 1991, Nyhus and Pons 2005, Almund, et al. 2011). Emotional stability is significantly and negatively correlated with extraversion and agreeableness, while agreeableness, decision making, conscientiousness, and openness are significantly and positively correlated with grit. Write is highly correlated with read. The results and previous literature suggest that *grit* and *write* should be excluded from the regression analysis.

There are some statistically significant differences in the distribution of non-cognitive skills across gender and age groups (Table B - 5). Females generally have higher scores of extraversion, agreeableness, conscientiousness, and lower

scores of emotional stability. These findings are consistent with results for Moldova (Kupets, Levin and Smolyar 2019), Russia (Rozhkova 2019), and Germany (Braakmann 2010). Inversely to our results, STEP surveys for Armenia and Georgia confirm a relatively higher level of emotional stability among women compared with men (Valerio, Herrera Sosa, et al., 2015). An interesting result is that older adults (45–64) have a lower level of emotional stability, and higher levels of agreeableness and conscientiousness than middle-aged adults (25–44). However, in research for Moldova emotional stability tends to improve with age, conversely to our results (Kupets, Levin and Smolyar 2019).

Empirical literature shows an undeniable role of socio-emotional skills on productivity and often determines an individual's position on the labor market. According to Table 5, employed Ukrainians on average tend to be more open to experience and emotionally stable than not currently employed urban residents. These results are in line with the results of Valerio, Herrera Sosa, et al., (2015) for Armenia and Georgia, and Rozhkova (2019) for Russia. However, in some countries, openness is negatively associated with labor force participation (Kupets, Levin and Smolyar 2019, Wichert and Pohlmeier 2010).

Table 5. Mean value of personality traits by employment status*

	Non-employed or inactive (base)	Employed
Extraversion	0.06	0.03
	(0.06)	(0.04)
Agreeableness	0.05	-0.02
	(0.06)	(0.05)
Conscientiousness	-0.06	0.02
	(0.05)	(0.05)
Emotional stability	-0.20	0.09***
	(0.06)	(0.04)
Openness	-0.11	0.14***
	(0.06)	(0.04)
Decision making	0.07	0.05
	(0.08)	(0.04)
Observations	843	1195

Source: author's calculations.
Note: Linearized standard errors are reported in parentheses. The sample excludes individuals below 25 years. Standardized scores are used for non-cognitive skills. Significant differences from the base category: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Having a particular set of personality traits predetermines occupation choice, treating education, cognitive skills, and other factors to be fixed. Table 6 shows which level of occupation is associated with socio-emotional skills in Ukraine. Comparatively to managers and professionals (high-skilled jobs), other occupations involve individuals with a lower average score of conscientiousness and decision making. Such a relationship between conscientiousness and occupational attainment is supported by many papers (Buehler, Sharma and Stein 2019, Barrick and Mount 1991, Kupets, Levin and Smolyar 2019, Del Carpio, et al. 2017). Open individuals are usually more creative and enthusiastic, and thus, are more suitable for complex jobs (high-skilled, skilled non-manual), which is consistent with previous research (Stuetzer, et al. 2018, Rozhkova 2019, Almund, et al. 2011).

* see Table B - 1 for the definition of *employed*

Table 6. Mean value of personality traits by occupational attainment

	Employee (base)	Self-employed	Occupation			
			High skilled (base)	Skilled non-manual	Skilled manual	Elementary
Extravers.	0.01	0.16	0.06	0.18	-0.18**	-0.05
	(0.04)	(0.17)	(0.06)	(0.10)	(0.58)	(0.10)
Agreeabl.	0.01	-0.17	0.09	-0.07	-0.06	-0.02
	(0.05)	(0.14)	(0.06)	(0.11)	(0.10)	(0.11)
Conscient.	0.04	-0.07	0.19	-0.08**	-0.11***	-0.07*
	(0.05)	(0.13)	(0.06)	(0.09)	(0.10)	(0.13)
Emotional stability	0.07	0.28	0.11	-0.07*	0.20	-0.10**
	(0.04)	(0.13)	(0.06)	(0.10)	(0.08)	(0.10)
Openness	0.12	0.33*	0.30	0.01***	-0.01***	-0.18***
	(0.04)	(0.12)	(0.06)	(0.09)	(0.09)	(0.10)
Decision Making	0.08	-0.16*	0.21	-0.07***	-0.05**	-0.14**
	(0.04)	(0.12)	(0.05)	(0.08)	(0.10)	(0.12)
Observations	1056	133	497	204	283	119

Source: author's calculations.
Note: Linearized standard errors are reported in parentheses. The sample excludes individuals below 25 years. Standardized scores are used for non-cognitive skills. Significant differences from the base category: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Service and sales workers (skilled non-manual), as well as individuals at elementary jobs, have significantly lower scores of emotional stability compared to high-skilled workers. It validates prior studies (Spector, Jex and Chen 1995, Rozhkova 2019, Kupets, Levin and Smolyar 2019). Craft and related workers, which also belong to the "skilled manual" group are the least talkative (lower scores of extraversion) according to our estimates, which could be a result of self-selection (extroverts usually choose jobs with social interaction for themselves, where they perform better (Barrick and Mount 1991). There are no statistically significant differences in agreeableness, which is in line with STEP results for Armenia (Valerio, Herrera Sosa, et al., 2015). Self-employed individuals are highly scored in openness (Table 6), which is in agreement with Stuetzer, et al. (2018).

In all sectors, would it be Finance and Real estate or Trade, or Agriculture, workers have to be very flexible to the rapidly integrated new techniques. Table 7 shows how the average scores of socio-economic skills differ across economic sectors. Significantly higher scores of openness are observed in Public services and also in Trade, transport, accommodation, and other services, compared with other industries, probably because these sectors often involve work in the fast environment rather than routine tasks. A higher level of emotional stability can be seen in Industry and Construction, where the uncertain environment and complex tasks are present. Individuals scored higher in agreeableness in Public services. This difference approaches the conventional threshold for statistical significance and is in agreement with Nyhus and Pons (2005), Judge, et al. (2013).

Table 7. Mean value of personality traits by industry

Sector	Extrav.	Agreeab.	Consc.	Emot. stab.	Open.	Dec. Making	Observa-tions
Agriculture	-0.14 (0.27)	-0.20 (0.24)	-0.69*** (0.20)	0.29 (0.18)	-0.24*** (0.21)	-0.08* (0.17)	36
Industry and construction	-0.14** (0.06)	-0.16 (0.07)	0.02 (0.07)	0.14** (0.06)	-0.05*** (0.06)	-0.02** (0.08)	345
Trade, Transport, Accommodation, Other Services	0.16 (0.09)	-0.07 (0.10)	-0.10* (0.10)	0.02*** (0.08)	0.12*** (0.09)	-0.01** (0.08)	300
Public Services	0.13 (0.07)	0.19 (0.08)	0.13 (0.09)	-0.05*** (0.08)	0.21*** (0.07)	0.09 (0.07)	360
Business Services (base)	0.22 (0.16)	-0.01 (0.19)	0.15 (0.09)	0.51 (0.15)	0.63 (0.14)	0.34 (0.15)	1094

Source: author's calculations.
Note: Linearized standard errors are reported in parentheses. The sample excludes individuals below 25 years. Standardized scores are used for non-cognitive skills. Significant differences from the base category: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

To sum up, already defined personality traits in the dataset are quire reliable measures to be used in further regression analysis. There are larger scores of openness and emotional stability for employed individuals. There are no

significant differences between employed and not employed in extraversion, agreeableness, conscientiousness, and decision making, which is in line with previous literature. Compared to high-skilled jobs, individuals at other jobs experience significantly lower levels of decision-making and conscientiousness; skilled-manual workers have lower scores in extraversion while at skilled non-manual and elementary jobs, on average, lower levels of emotional stability are observed. Public services involve individuals with high scored highly in openness; Trade, transport, accommodation, and other services – people with higher than average level of emotional stability and openness; Industry and construction include workers with a relatively high level of emotional stability.

C h a p t e r 4

ESTIMATION RESULTS AND ROBUSTNESS CHECK

This chapter presents 1) estimation results for the logit and multinomial logit models stated in Chapter 3, 2) reverse causality check and correction, 3) robustness check and 4) mediating analysis.

4.1 Estimation results

4.1.1 Model for employment

Table 8 provides the result of estimating equation 3.1. All regressions are shown for the whole population and separately for men and women. We also run regressions with and without education since it is closely related to both cognitive and non-cognitive skills. A full set of estimated coefficients is available in Table C – 1. Everything else equal, one standard deviation increase in emotional stability increases employment by 4.3 percentage points. Higher scores in conscientiousness are also associated with a higher probability to be employed. The effects are consistent with previous literature and initial descriptive statistics (Table 5)

If education is excluded, emotional stability for males and openness for females became statistically significant, and the effect for all population became higher in magnitude, which is consistent with Kupets, Levin, and Smolyar (2019) and Rozhkova (2019). It suggests that education captures some effect of women's level of creativity and men's level of emotional stability. It can be seen from Table 8 that men have a higher probability of being employed if they are more open to experience while women have a higher probability of being employed if they are more conscientious and emotionally stable, keeping other variables constant.

Table 8. Marginal effects for logit regression (*dependent variable: Employed)*

Variable	Dy/dx					
	With education			Without education		
	All	Male	Female	All	Male	Female
Extraversion	-0.006	0.001	-0.008	-0.007	0.001	-0.010
	(0.013)	(0.022)	(0.017)	(0.014)	(0.022)	(0.017)
Agreeableness	-0.004	-0.011	0.003	-0.005	-0.010	0.001
	(0.015)	(0.020)	(0.018)	(0.015)	(0.019)	(0.018)
Conscientiousness	0.025*	0.016	0.037**	0.025*	0.015	0.037**
	(0.013)	(0.021)	(0.015)	(0.013)	(0.020)	(0.016)
Emotional stability	0.043***	0.037	0.033**	0.044***	0.037*	0.034**
	(0.014)	(0.022)	(0.015)	(0.014)	(0.022)	(0.016)
Openness	0.038***	0.070***	0.026	0.043***	0.069***	0.033*
	(0.014)	(0.021)	(0.017)	(0.014)	(0.021)	(0.018)
Decision making	-0.018	-0.013	-0.023	-0.016	-0.012	-0.022
	(0.014)	(0.025)	(0.019)	(0.014)	(0.025)	(0.019)
Observations	1,850	583	1,254	1,850	583	1,254
PSUs	293	230	286	293	230	286
Log-likelihood	-972.48	-273.73	-667.09	-975.54	-274.12	-670.72
Pseudo R^2	0.22	0.25	0.22	0.21	0.25	0.22

Source: author's calculations.
Note: The Table reports selected coefficients (for the full set of estimated coefficients, see Appendix C). Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Standardized scores are used for non-cognitive skills. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the logit model

Individuals scored highly in openness are curious and flexible, they are good at exploring new ideas and implementing new approaches. Openness remains statistically significant even while controlling for education. A one standard deviation increase in openness to experience is associated with a 3.8 percentage points increase in the probability of being employed, keeping other variables unchanged (Table 8), which is in line with previous literature and descriptive statistics (Table 5). Not statistically significant effect of extraversion and agreeableness is in line with previous literature (Del Carpio, et al. 2017) and initial exploratory data analysis (Table 5).

We would like to judge whether our logit model is performing well in terms of its predictive power. One of the goodness of fit measures is the Area under the Receiver Operating Characteristics Curve (AUROC). We have run logit models 100 times using bootstrapped records and constructed the ROC curves, following (Peterson 2010). The model for the whole population, which includes the educational level, has the highest area under the curve – 0.80 (Figure 1), which indicates that the model has an 80% chance.

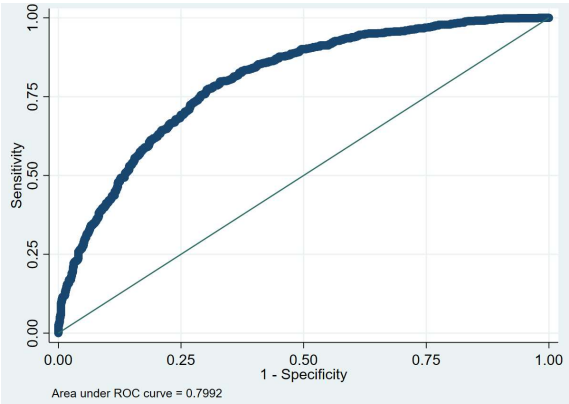

Figure 1. The ROC curve for the logit model (dependent variable: *Employed*)

4.1.2 Model for the occupational attainment

Estimation results from equation 3.3 are illustrated in Table 9 (see the full model in Table C - 2). High levels of extraversion are needed at jobs that involve social interaction and teamwork. Holding other variables constant, a one standard deviation increase in extraversion is associated with a 2.6 percentage point increase in the probability of occupying support or sales jobs ("skilled non-manual"). However, scoring high in extraversion is negatively associated with

employment at "skilled manual" jobs (craft and machine operator workers), which include fewer situations where communication skills are needed.

Ceteris paribus, having a higher than average level of emotional stability enhances the chance of being at a managerial or professional position ("high-skilled" group), which is consistent with the previous literature and exploratory data analysis (Table 6). Emotionally stable people could remain self-confident and optimistic under stressful situations, which is very important at managerial positions.

The effect of conscientiousness is not statistically significant for all the occupation levels, which is consistent with our descriptive statistics (Table 6) and previous literature (Kupets, Levin, and Smolyar 2019, Del Carpio, et al. 2017, Rozhkova 2019). One potential explanation could be derived from Table 4: the average level of conscientiousness is among the highest and since it is a very socially desirable trait, many people could see themselves as highly disciplined, responsible, and accurate. Moreover, these characteristics are required by many jobs, thus, conscientiousness is a "pass" to the workplace, meaning that you have to have some minimum level to receive at least low-skilled occupation.

Interesting results are achieved for the male and female samples (Table C - 3). At first, extraversion positively affects the probability of employment at service and sales jobs ("skilled non-manual") for men while agreeableness has a negative impact. Secondly, women have a 5-percentage point higher chance of being employed in a high-skilled job if there is a decrease in their level of neuroticism by one standard deviation.

Table 9. Estimation results for the multinomial logit (*dependent variable: Occupation)*

Variable	dy/dx			
	High skilled	Skilled non-manual	Skilled manual	Elementary
Extraversion	0.005	0.026*	-0.039**	0.007
	(0.015)	(0.016)	(0.015)	(0.011)
Agreeableness	0.011	-0.012	0.000	0.000
	(0.018)	(0.018)	(0.020)	(0.010)
Conscientiousness	0.010	0.000	-0.016	0.005
	(0.018)	(0.018)	(0.015)	(0.010)
Emotional stability	0.043***	-0.026**	-0.002	-0.013
	(0.015)	(0.014)	(0.013)	(0.009)
Openness	0.009	-0.001	0.012	-0.020*
	(0.018)	(0.016)	(0.015)	(0.010)
Decision making	0.019	-0.022	0.015	-0.012
	(0.018)	(0.016)	(0.018)	(0.010)
Observations	1027			
PSUs	280			
Log-likelihood	-828.04			
Pseudo R^2	0.35			

Source: author's calculations.
Note: The Table reports selected coefficients (for the full set of estimated coefficients, see Appendix C). Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Standardized scores are used for non-cognitive skills. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the logit model

4.1.3 Model for the economic sector

Table 10 gives the result of sector choice (regression 3.4, described in the Methodology part). All estimated coefficients are presented in Table C - 4. A one standard deviation increase in agreeableness is associated with a 3.8 percentage points increase in the probability to be employed in Education, Health, or other public services. Agreeable individuals are likely to be altruistic, forgiving, and cooperative, which is a good fit for Public services, as we described in the Data description section. High levels of emotional stability are associated with a higher chance to be employed in Finance, real estate, or other business services.

Emotionally stable individuals can critically think and make decisions under stressful situations.

Table 10. Estimation results for the multinomial logit regression (*dependent variable: Sector)*

Variable	Agriculture	Industry and Construct.	dy/dx Trade, Transport, Accommodation, Other Services	Public Services	Business Services
Extraversion	-0.001	-0.047***	0.029	0.011	0.009
	(0.005)	(0.016)	(0.018)	(0.016)	(0.008)
Agreeableness	0.003	-0.015	-0.019	0.038**	-0.006
	(0.005)	(0.019)	(0.019)	(0.019)	(0.011)
Conscientiousness	-0.012**	0.026	-0.010	-0.007	0.003
	(0.005)	(0.018)	(0.020)	(0.018)	(0.008)
Emotional stability	0.019***	-0.016	-0.020	0.003	0.014**
	(0.006)	(0.015)	(0.017)	(0.017)	(0.008)
Openness	-0.010	-0.015	-0.005	0.013	0.017
	(0.007)	(0.019)	(0.022)	(0.021)	(0.011)
Decision making	0.007	0.014	0.012	-0.039*	0.005
	(0.006)	(0.020)	(0.023)	(0.022)	(0.011)
Observations			737		
PSUs			280		
Log-likelihood			-1100.17		
Pseudo R^2			0.20		

Source: author's calculations. STEP Household Survey Ukraine, 2012
Note: The Table reports selected coefficients (for the full set of estimated coefficients, see Appendix C). Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Standardized scores are used for non-cognitive skills. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the logit model

More insights can be seen in Table C - 5 for male and female samples. At first, ceteris paribus, a one standard deviation increase in openness increases the probability of a male to be employed in Business services by almost 9 percentage points. Secondly, holding other variables constant, higher scores of

conscientiousness increase the probability to be employed in Industry and construction for females while extraversion decreases it.

4.2 Handling reverse causality

We applied the multivariate probit technique described in equation 3.5, where error terms of each equation are allowed to be correlated, thus the model covers the personality traits with employment characteristics simultaneously. Error terms are distributed with zero mean, unit variance, and correlation ϱ. All models converged satisfactorily and correlation coefficients between residuals are shown in Appendix C (Tables C-6 – C-8). As for employment, all coefficients are positive and statistically significantly different from zero at the 10% level (Table C - 6). It suggests that employment together with socio-emotional skills is affected by some unobservable factors. We have to account for the measurement error that comes from the definition of "employed", which is given in Table B - 1. Results support the use of a multivariate probit model. Estimated pairwise correlation coefficients between error terms of occupation choice and non-cognitive skills from the 3.5 model are given in Table C - 7 and it implies that equations for high-skilled jobs, openness, emotional stability, and decision making are interrelated. A significant correlation between the error terms of the agreeableness and "Public services", as well as for the extraversion and "Trade, transport…", conscientiousness and "Industry and Construction", also suggests that there is some intrinsic correlation between these equations (Table C - 8).

In order to overcome some presence of the reverse causality in our models, we use results from equations 3.6 (for males and females samples) and 3.7 (for the whole population) to obtain the logit model for *employment* (Table C - 9), multinomial logit models for *occupation* (Table C - 10) and *sector* (Table C - 11). We received the same signs of coefficients and even the same significance level of socio-emotional skills.

Thus, we might treat that the time-invariant personality traits assumption holds with our data.

4.3 Robustness check

The strategy for linear models of just dropping or adding some variables to make the robustness check will not work in the logit models since coefficients change in response to the total variation explained in the model, hence, they are not comparable between different specifications.

From Table C-1 we can observe that being married decreases the probability to be employed for women and increases for men, holding other variables constant. Ceteris paribus, having one more child under 6 decreases employment probability for women by 6.2 percentage points, suggesting that children are an additional constraint for females in the labor market. We tried different model specifications by adding interactions of being a female with marital status and being a female with the number of children under six years old to show potential gender differences in the effect size of the personality indicators on labor market outcomes.

The results are shown in Tables C-12 – C-14. As can be seen, neither the sign nor statistical significance has been changed. We can conclude that our main specification used for employment status, occupational attainment, and industry choice all have valid statistical inferences since they are independent of the model specifications.

4.4 Mediating analysis

We used a technique, proposed by Karlson and Holm (2011), Karlson, Holm, and Richard (2012), Karlson, Holm, and Richard (2013). We decomposed the effect of personality traits on employment status, occupational attainment, and sector of

employment. The measure of the family environment (from Table B – 3) as a mediator is used. We focus on the parental background and parental involvement in a child's education, family structure, and family socioeconomic status at an early age since these characteristics have very powerful effects on the individuals' development, impacting personality traits. All models control for all other variables from Table B-3: demographic variables and cognitive skills (called concomitants or confounding factors in (Karlson and Holm 2011)). A negative "percent reduced" can be interpreted as a suppressing effect.

Table C - 15 represents the breakdown of personality traits' effect on employment by the individual mediators. We found that a mother's upper-secondary education, some parental involvement in child education, and living with at least one of parents at the age of 12 accounts for almost 9% of the association between employment and conscientiousness. Living with at least one of the parents at the age of 12 accounts for 6.52% of the association between employment status and emotional stability.

We discovered that mother's post-secondary and higher education accounts for almost 9% of the association between a high-skilled job and emotional stability, while middle socio-economic status – for 6% (Table C - 16). Average parental involvement in education, post-secondary, and higher education of mother and having high socioeconomic status at the age of 15 accounts for almost 20% of the association between high-skilled jobs and openness.

The results from Table C - 17 indicate that the largest mediating effect on the relationship between emotional stability and having a job in Industry and Construction has lived with both parents at the age of 12. According to the decomposition, the largest effect on the probability to be employed in Public services has agreeableness and emotional stability; 29% and 39% of these effects

are accounted for by living with mother and father at the age of 12 respectively. 8% of the relationship between employment in Business services and openness is mediated by the average level of parental involvement in education. The relationship between emotional stability and employment in Trade, transport, accommodation, and other services is mediated mostly by living with parents at 12 years old (25%).

Interestingly, some studies confirm that high socio-economic family status at childhood and parental involvement in education has a significant impact on the emotional stability and development of creativity (openness to experience) (Nakao, et al. 2000).

In brief, emotional stability together with conscientiousness increase the probability to be employed. Emotional stability also increases the chance to occupy a high-level job or being employed in Business services. Extraversion matters for jobs that involve social interaction ("skilled non-manual"). Agreeableness is associated with a higher probability to be employed in Public services. As has been noted, our estimation results are robust as we tried different specifications with interaction terms and regression-corrected personality traits.

Mediating analysis shows that mother's post-secondary education and higher, an average level of parental involvement in education ("Sometimes"), high socio-economic status of the family at age of fifteen and living with parents at the age of twelve moderated the relationship between employment characteristics and personality traits.

Chapter 5

CONCLUSIONS AND POLICY IMPLICATIONS

5.1 Conclusions

In this paper, we estimated the effect of personality traits on employment status, occupation, and sector choices. We implement this analysis by using survey logit and multinomial logit models. For our estimations we use representative data from the World Bank - STEP Skills Measurement Household Survey 2012 with sample weights for age, gender, and region. While previous empirical research shows either the associating effects, or logit models for employment only, or they are done for other countries, we analyze the predictive power of personality traits on the most important labor market outcomes for Ukraine.

Among our most noticeable results, we find that scoring higher in emotional stability and openness to experience has a positive effect on the probability to be employed, holding other variables constant. Emotional stability significantly increases the chance to occupy a high-level job and is associated with employment in Business services (financial intermediation, real estate, etc.). These results are consistent with our initial hypotheses. No statistically significant impact of openness to experience on the probability to be employed at high-skilled jobs could be explained by the included education level, which captures some effect. Agreeableness has a positive impact on the probability to be employed in Public services (education, health, and social work, public administration, etc.), which is in line with our initial hypothesis.

Conscientiousness has a favorable impact on the probability to be employed, but it is some kind of prerequisite of occupying any job. Extraversion positively

affects the probability of occupying skilled non-manual jobs (clerical support, service, and sales workers) and has a negative impact on employment in Industry and construction. No statistically significant effect of conscientiousness and extraversion on the probability to be employed and occupy managerial position is in line with previous literature.

We found that the largest mediating effect on the relationship between employment characteristics and personality traits (emotional stability, conscientiousness, openness) have mother's upper-secondary education, average parental involvement in child education, living with mother or father at the age of 12 and having a high socioeconomic status of the family at the age of 15.

5.2 Policy implications

The previous chapter showed that socio-emotional skills play a significant impact on employment characteristics. These results might be applied in the development of education programs aimed at personality traits improvement (involving pupils, adolescents, teachers, and parents) as well as training programs in the workplace. Implementation of the education reform program "the New Ukrainian School" is highly relevant at the time of war and coronavirus pandemic. It should be noted that socio-emotional programs will not work without additional funding for their implementation.

1. Pre-school education

Early childhood programs (age 3-5) have a strong impact on children's development, significantly improving later outcomes in adulthood. Impulse control (emotional stability) and communication with peers (extraversion) have their foundation at this age. We suggest that such programs should be

implemented in rural areas, for children with disabilities, in conflict-affected areas, and engage all three sides of the process: children, their parents, and teachers. Participation in Early Childhood Programs was shown to affect extraversion, agreeableness, conscientiousness, grit, and empathy (reading the mind in the eyes) later in life according to Georgia, Armenia and Moldova experience (Valerio, Herrera Sosa, et al., 2015, Valerio, Herrera Sosa, et al., 2015, Kupets, Levin and Smolyar, 2019). Other European countries' experience supports the above-mentioned findings. For example, Melhuish, et al. (2015) found that European Early Childhood Education and Care Programs have a long-lasting impact on communication skills and emotional stability (while the only short-term effect on IQ was observed).

2. Primary and lower secondary education

Teachers should account for the variability in human development and do not treat all children around some average. For example, time for completion some tasks should be based on individual ability (including the ability to work in the team). Many individual characteristics are already accounted for in the New Ukrainian School approach (Ministry of Education and Science of Ukraine 2016).

Social, Emotional, and Ethical (SEE) Learning was introduced in Ukraine by NGO "EdCamp Ukraine", which goal is to develop critical, creative, and systematic thinking, teamwork, awareness, empathy, and tolerance. Such programs, as SEE and socio-emotional learning (SEL) programs, Collaborative for Academic, Social, and Emotional Learning (CASEL) significantly improve the emotional climate of schools (Zhai, Raver, and Jones, 2015). They are useful in preparing children for "their potential life roles as family, community, and workforce members", as stated in the Melbourne Declaration on Educational Goals for Young Australians (MCEETYA 2008). Any additional dollar spent on

such programs was estimated to have eleven dollars return according to the cost-benefit analysis in Indiana (Oliver 2018).

We suggest focusing also on such programs when working with psychological traumas, which is relevant for a country at war and epidemic. SEE programs are now piloted in 25 schools, but they should be developed in small towns and villages as well. Also, teachers must experience soft skills by themselves first to successfully implement such programs. Different mindfulness, socio-emotional learning, and stress management programs, should be available as teachers' feelings of stress immediately transfer to children. For example, Cultivating Awareness and Resilience in Education (CARE) programs were shown to have a sustained effect on the emotional stability of teachers, affecting outcomes for students (Jennings and Greenberg 2017). Accreditation requirements should be applied to teachers and administration staff. The New Ukrainian School approach suggests that there should be freedom for the teacher to choose among a wide variety of post-graduate institutes of pedagogical education (PGIPE) courses, webinars, conferences, workshops, certificated online courses.

Moreover, teachers' role is shifted nowadays from the primary source of the information (as long as a lot of information is available online) to the development of children as the whole personality. The last includes giving constant feedback. The World Bank suggests using the Knowledge Is Power Program (KIPP), which includes a teacher's assessment of a student mastering in socio-emotional skills, which is shared and discussed with parents (Cunningham, Acosta, and Muller 2016).

A special role should be given to parents. As young children tend to model the behavior of their parents, different parental support programs should be

developed. A lot of studies confirm that parents' levels of emotional stability, as well as agreeableness and conscientiousness, affect the same personality traits development of children later in life through "positive" parenting (Schofield, et al. 2012). With the help of different student-teacher-parent conferences and other forms of regular communication, parents can help their children to cope with stress during coronavirus pandemic and war.

3. Upper-secondary and post-secondary education

Adolescence is another period where some personality traits continue to develop at a fast rate as hormonal and physical levels change. For instance, The European Union member states have adopted Dublin Descriptors[*] in order to assess students' achievements. One of these descriptors is lifelong learning skills, which are called socio-emotional skills in our paper. Faculty members in universities should encourage different methods to develop such skills. By allowing children to choose different subjects by themselves and giving the right to switch between them will develop conscientiousness (responsibility for the decisions and ability to work independently in this case). Leadership skills will be more developed if we have mentorship, research, and teaching assistant programs. Classes using presentations will develop public speaking skills. Some tasks can be given to work in teams, which will develop extraversion (communication, as well as collaboration skills). Other tasks can be individual but focused not on memorizing the information, but on the development of critical and creative thinking, and problem-solving skills. Moreover, different extracurricular activities should be present and students' initiatives should be encouraged (clubs, etc.), as it develops not only communication skills but time management also.

[*] https://ec.europa.eu/education/ects/users-guide/glossary_en.htm

4. Private sector

Once individual graduates from the university, skills start to develop in the workplace. Different Active Labor Market Programs (ALMPs) improving non-cognitive skills should be implemented in enterprises and organizations via on-the-job and off-the-job training, soft skills workshops, internships, mindfulness programs, and other kinds of training. The implementation of such programs is problematic because of high heterogeneity among firms and their needs. It is especially hard for small businesses because of the lack of resources. According to The World Bank, cooperation of firms, NGOs, and the government together with subsidies provided to enterprises might help in developing soft skills training (Glick, Huang, and Mejia 2015).

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APPENDIX A

STRUCTURE OF THE STEP TEST

Table A - 1. Aggregation of socio-emotional skills

Socio-emotional skill	Questions/components: STEP approach
Extraversion	Are you talkative?
	Do you like to keep your opinions to yourself? *
	Are you outgoing and sociable, for example, do you make friends very easily?
Agreeableness	Do you forgive other people easily?
	Are you very polite to other people?
	Are you generous to other people with your time or money?
Conscientiousness	When doing a task, are you very careful?
	Do you prefer relaxation for more than hard work? *
	Do you work very well and quickly?
Emotional Stability	Are you relaxed during stressful situations?
	Do you tend to worry? *
	Do you get nervous easily? *
Openness	Do you come up with ideas other people haven't thought of before?
	Are you very interested in learning new things?
	Do you enjoy beautiful things, like nature, art, and music?
Grit	Do you finish whatever you begin?
	Do you work very hard? For example, do you keep working when others stop to take a break?
	Do you enjoy working on things that take a very long time (at least several months) to complete?
Decision making	Do you think about how the things you do will affect you in the future?
	Do you think carefully before you make an important decision?
	Do you ask for help when you don't understand something?
	Do you think about how the things you will do will affect others?
Hostile attribution bias	Do people take advantage of you?
	Are people mean/not nice to you?

Source: Pierre, et al. 2014

Note: * - scale 1 – "Almost always" and 4 - "Almost never" is used. For questions without an asterisk scale 1 – "Almost never" and 4 - "Almost always" is used

APPENDIX B

DESCRIPTIVE STATISTICS

Table B - 1. Variable description used for building the models

Variable	Description
Dependent variables	
Employed	1 – employed, 0 – unemployed. Under the STEP an individual is considered "employed" if he/she either worked at least one hour or reported undertaking an occasional job in the past seven days, or is currently absent from a permanent / long term job and will return to the same job. The person is considered to be "unemployed" if he or she did not work in the past 7 days, is not currently absent from a permanent / long term job or will not be returning to the same job, is looking for a job or trying to set up a business and is available to start work within the next two weeks
Occupation	Occupation level "High skilled" includes ISCO groups 1-3 (Managers, Professionals, Technicians and associate professionals); "Skilled non-manual" includes ISCO groups 4 and 5 (Clerical support workers, service and sales workers). "Skilled manual" includes ISCO groups from 6 to 8, i.e. Craft and related trades workers, plant and machine operators, and assembly.
Sector	ISIC, Rev.3.1 was used for the economic sector in the survey. Public Services include Public administration and defense, Education, Health and social work, Other community, social and personal service activities. Business services include Financial intermediation, Real estate, renting and business activities, Activities of private households as employers and undifferentiated production activities of private households, Extraterritorial organizations and bodies, Activities of membership organizations.
Independent variables	
Demographic variables	
Age	Age in years and age squared
Gender	1 – female, 0 – male
Married	1 – married, 0 – unmarried
Children	Continuous variable for the number of children under 6 the respondent has
Mother_tongue	1 – Ukrainian, 2 – Ukrainian and other, 3 – Russian, 4 – Others

Table B - 1 - Continued

Variable	Description
Region	Area of living
BMI	Body Mass Index: weight divided by the square of the body height
Cognitive skills	
Read	Dummy for reads overall: 0 – No (if respondent reports not using a skill), 1 – Yes. Generated from the question: Thinking about all the things that you have read over the past twelve months, what is the size of the longest document that you have read?
Numeracy	Dummy for numeracy overall: 0 – No, 1 – Yes. Generated from the question: Thinking of your activities over the past twelve months, have you done any of the following: - measure or estimate sizes, weights, distances, etc.; - calculate prices or costs; - use or calculate fractions, decimals or percentages; - perform any other multiplication or division; - use more advanced math, such as algebra, geometry, trigonometry, etc.; - other math
Educ_level	The education level of the respondent was generated based on the answer on the question "What is the highest level of formal education that you have completed?" and the ISCED 1997, that was used in the survey. 0 – Lower than upper secondary, 1 – Upper secondary, 2 – Post-secondary non-tertiary, 3 – Tertiary
Family background	
Mother_educ	Mother's highest level of education attained: Early childhood education, Primary education, lower and upper secondary, post-secondary non-tertiary and higher
SES	Socioeconomic status at age 15: 1– low, 2 – middle, 3 – high
Siblings	Number of younger brothers, younger sisters, older brothers or older sisters at age 12
Shocks	1 – at least one shock before age 15, 0 – no shocks
Parental	Parental involvement in education: 1 – always or almost always, 2 – sometimes, 3 – never or almost never
Father_mother	Lived with mother and father at age 12: 0 – didn't live with father and mother, 1 – lived with one of them, 2 – lived with both

Table B - 2. Distribution of dependent variables

Variable	Freq.	Percent	Cum.
Employment status			
Unemployed	840	41.4	41.4
Employed	1189	58.6	100
Total	2029	100	
Occupation			
High skilled	498	45.11	45.11
Skilled non-manual	204	18.48	63.59
Skilled manual	283	25.63	89.22
Elementary occupations	119	10.78	100.00
Total	1104	100	
Sector			
Agriculture	36	3.29	3.29
Industry and Construction	345	31.54	34.85
Trade, Transport, Accommodation, and Other services	300	27.42	62.25
Public Services	360	32.91	95.16
Business Services	53	4.84	100.00
Total	1094	100	

Table B - 3. Descriptive statistics of independent variables

Variable	Mean	Std. Dev.	Min	Max	Obs
Demographic variables					
Age	45.7	12.25	25	64	2032
Gender	0.68	0.47	0	1	2032
Married	0.78	0.41	0	1	2032
Children	0.22	0.50	0	3	2042
Mother_tongue	2.29	0.98	1	4	2031
BMI	26.69	5.03	15.6	53.7	1962
Cognitive skills					
Read	0.86	0.34	0	1	2025
Numeracy	0.88	0.33	0	1	2025
Educ_level	2.02	0.98	0	3	2042
Family background					
Mother_educ	1.11	0.66	0	2	2032
SES	1.97	0.61	1	3	1977
Siblings	1.34	1.23	0	10	2042
Shocks	0.19	0.40	0	1	2007
Parental	1.36	0.59	1	3	2020
Father_mother	1.11	0.35	0	2	2032

Table B - 4. Correlations between socio-emotional skills and education level

	Extravers.	Agreeabl.	Conscient.	Emot. stability	Openness	Grit	Decision making	Read	Num.	Write
Extravers.	1.00									
Agreeabl.	0.29*	1.00								
Conscient.	0.11*	0.32*	1.00							
Emot. stability	-0.15*	-0.05*	0.07*	1.00						
Openness	0.28*	0.31*	0.34*	0.03	1.00					
Grit	0.14*	0.35*	0.42*	0.12*	0.42*	1.00				
Decision making	0.16*	0.39*	0.36*	0.02	0.46*	0.39*	1.00			
Read	0.12*	0.02	0.10*	0.03	0.12*	0.06*	0.10*	1		
Num.	0.05*	-0.05*	0.03	0.02	0.08*	0.02	0.06*	0.30*	1	
Write	0.09*	0.06*	0.11	0.02	0.13*	0.07*	0.10*	0.41 *	0.29*	1

Note: Standardized personality traits are used. Correlation is significant at the 0.05 level (2-tailed)

Table B - 5. Mean value of personality traits by gender and age

Socio-emotional skill	Gender		Age			
	Male (base)	Female	25-34 (base)	35-44	45-54	55-64
Extraver.	-0.23	0.17***	0.10	0.01	0.04	-0.01
	(0.06)	(0.04)	(0.06)	(0.08)	(0.06)	(0.06)
Agreeabl.	-0.21	0.11***	-0.11	-0.07	0.09**	0.12***
	(0.08)	(0.04)	(0.07)	(0.07)	(0.07)	(0.06)
Conscient.	-0.25	0.10***	-0.12	-0.12	0.09**	0.08**
	(0.07)	(0.04)	(0.07)	(0.06)	(0.08)	(0.06)
Emotional stability	0.35	-0.20***	0.13	0.12	-0.19***	-0.12**
	(0.06)	(0.04)	(0.07)	(0.06)	(0.07)	(0.07)
Openness	-0.02	0.08	0.19	0.09	0.08	-0.17***
	(0.07)	(0.04)	(0.06)	(0.07)	(0.07)	(0.07)
Decision Making	-0.16	0.16***	0.09	0.02	0.08	0.03
	(0.07)	(0.05)	(0.06)	(0.07)	(0.08)	(0.06)

Note: Linearized standard errors are reported in parentheses. The sample excludes individuals below 25 years. Standardized scores are used for non-cognitive skills. Significant differences from the base category: * p < 0.10, ** p < 0.05, *** p < 0.01

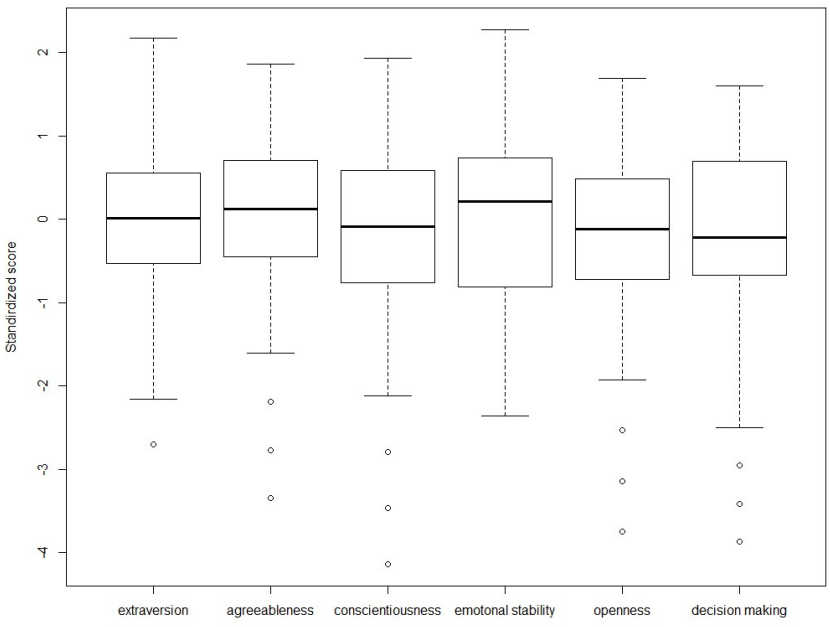

Figure B - 1. Distribution of standardized personality traits

APPENDIX C

ESTIMATION RESULTS

Table C - 1. Marginal effects for logit regression (*dependent variable: Employed)*

Variable	Dy/dx					
	With education			Without education		
	All	Male	Female	All	Male	Female
Age	0.0632***	0.0263*	0.0790***	0.0622***	0.0248	0.0780***
	(0.00899)	(0.0156)	(0.0108)	(0.0090)	(0.0153)	(0.0108)
Age_sq	-0.0008***	-0.0004**	-0.0010***	-0.0008***	-0.0004**	-0.0009***
	(0.0000)	(0.0001)	(0.0001)	(0.0000)	(0.0001)	(0.0001)
Gender	-0.0891***	-	-	-0.0859**	-	-
	(0.0332)			(0.0332)		
Married	-0.0097	0.1260**	-0.0605*	-0.0079	0.1310**	-0.0588*
	(0.0299)	(0.0613)	(0.0350)	(0.0299)	(0.0587)	(0.0352)
Children	-0.0531**	-0.0649	-0.0622**	-0.0537**	-0.0637	-0.0647**
	(0.0262)	(0.0445)	(0.0314)	(0.0261)	(0.0446)	(0.0311)
Mother_tongue (Other only = base)						
Ukranian only	0.0620	0.0831	0.0638	0.0580	0.0812	0.0634
	(0.0489)	(0.0781)	(0.0689)	(0.0496)	(0.0799)	(0.0701)
Ukranian and Other	0.0970**	-0.0137	0.1390**	0.0953**	-0.0121	0.142**
	(0.0417)	(0.0786)	(0.0569)	(0.0418)	(0.0785)	(0.0569)
Russian only	-0.00887	-0.0850	0.0438	-0.0100	-0.0847	0.0461
	(0.0459)	(0.0706)	(0.0691)	(0.0456)	(0.0719)	(0.0695)
BMI	0.0324*	0.0474	0.0272	0.0320*	0.0498	0.0264
	(0.0174)	(0.0404)	(0.0202)	(0.0171)	(0.0393)	(0.0198)
BMI_sq	-0.0004	-0.0007	-0.0003	-0.0004	-0.0008	-0.0003
	(0.0003)	(0.0007)	(0.0003)	(0.0003)	(0.0007)	(0.0003)
Non-cognitive skills						
Openness	0.0380***	0.0697***	0.0258	0.0426***	0.0688***	0.0330*
	(0.0142)	(0.0214)	(0.0177)	(0.0141)	(0.0209)	(0.0181)
Conscient.	0.0249*	0.0155	0.0368**	0.0252*	0.0149	0.0374**
	(0.0132)	(0.0205)	(0.0153)	(0.0132)	(0.0195)	(0.0157)
Extraversion	-0.0062	0.0014	-0.0079	-0.0070	0.0013	-0.0097
	(0.0134)	(0.0223)	(0.0167)	(0.0137)	(0.0224)	(0.0168)
Agreeableness	-0.00363	-0.0108	0.0034	-0.0050	-0.0101	0.0008
	(0.0152)	(0.0197)	(0.0182)	(0.0148)	(0.0192)	(0.0177)
Emot. stability	0.0433***	0.0366	0.0325**	0.0438***	0.0372*	0.0335**
	(0.0136)	(0.0224)	(0.0154)	(0.0136)	(0.0222)	(0.0155)
Decision making	-0.0182	-0.0134	-0.0229	-0.0159	-0.0119	-0.0219
	(0.0140)	(0.0252)	(0.0187)	(0.0142)	(0.0252)	(0.0192)

Table C - 1 - Continued

Variable	Dy/dx					
	With education			Without education		
	All	Male	Female	All	Male	Female
Cognitive skills						
Read	0.1260***	0.0984	0.1240**	0.1330***	0.0934	0.1360**
	(0.0478)	(0.0733)	(0.0563)	(0.0461)	(0.0736)	(0.0551)
Numeracy	0.1330***	0.1050*	0.1540***	0.1300***	0.1030*	0.1500***
	(0.0452)	(0.0611)	(0.0548)	(0.0449)	(0.0603)	(0.0538)
Education (Lower than upper secondary = base)						
Upper secondary	-0.0132	-0.0864	0.0359	-	-	-
	(0.0910)	(0.150)	(0.0919)			
Post-secondary non-tertiary	-0.0209	-0.0966	0.0279	-	-	-
	(0.0897)	(0.147)	(0.0952)			
Tertiary	0.0430	-0.0760	0.108	-	-	-
	(0.0872)	(0.150)	(0.0917)			
Mother Education (Lower than upper secondary = base)						
Upper secondary	-0.0303	-0.0857	-0.00547	-0.0319	-0.0911*	-0.0078
	(0.0386)	(0.0553)	(0.0478)	(0.0393)	(0.0528)	(0.0479)
Post-secondary and higher	0.0381	0.0262	0.0494	0.0454	0.0259	0.0554
	(0.0472)	(0.0720)	(0.0566)	(0.0467)	(0.0703)	(0.0559)
SES (Low = base)						
Middle	0.0336	0.0345	0.0128	0.0370	0.0354	0.0188
	(0.0308)	(0.0464)	(0.0370)	(0.0305)	(0.0456)	(0.0363)
High	0.0472	0.0551	0.0274	0.0523	0.0528	0.0362
	(0.0447)	(0.0760)	(0.0542)	(0.0450)	(0.0771)	(0.0534)
Siblings	-0.0155	-0.00640	-0.0241*	-0.0178*	-0.00690	-0.0276**
	(0.0101)	(0.0175)	(0.0123)	(0.0099)	(0.0176)	(0.0122)
Shocks	0.0668*	0.0177	0.1000**	0.0643*	0.0168	0.0989*
	(0.0352)	(0.0430)	(0.0504)	(0.0360)	(0.0433)	(0.0507)
Parental (Always = base)						
Sometimes	-0.0673*	0.0242	-0.1220***	-0.0775**	0.0224	-0.1370***
	(0.0356)	(0.0457)	(0.0464)	(0.0355)	(0.0465)	(0.0457)
No, never or almost never	0.0604	0.0844	0.0446	0.0508	0.1090	0.0331
	(0.0481)	(0.0810)	(0.0603)	(0.0492)	(0.0678)	(0.0613)

Table C - 1 - Continued

Variable	Dy/dx					
	With education			Without education		
	All	Male	Female	All	Male	Female
Father_mother (Lived with father & mother= base)						
Didn't live with father & mother	-0.0553	-	-0.0920	-0.0444	-	-0.0689
	(0.1380)		(0.1440)	(0.1300)		(0.1380)
Lived with one	0.0674	-0.0497	0.1300**	0.0726	-0.0582	0.1410**
	(0.0467)	(0.0701)	(0.0564)	(0.0474)	(0.0698)	(0.0568)
Observations	1,850	583	1,254	1,850	583	1,254
PSUs	293	230	286	293	230	286
Log-likelihood	-972.48	-273.73	-667.09	-975.54	-274.12	-670.72
Pseudo R^2	0.22	0.25	0.22	0.21	0.25	0.22

Note: Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. All regressions control for region dummies. Standardized scores are used for non-cognitive skills. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the logit model

Table C - 2. Estimation results for multinomial logit regression (*dependent variable: Occupation)*

Variable	dy/dx			
	High skilled	Skilled non-manual	Skilled manual	Elementary
Age	0.0015	-0.0110	0.0113	-0.0018
	(0.0131)	(0.0130)	(0.0129)	(0.0069)
Age_sq	0.0001	0.0001	-0.0002	0.0001
	(0.0001)	(0.0001)	(0.0001)	(0.0001)
Gender	0.0885**	0.1424***	-0.2535***	0.0226
	(0.0349)	(0.0344)	(0.0247)	(0.0193)
Married	0.0739**	-0.0063	-0.0036	-0.0640***
	(0.0385)	(0.0337)	(0.0387)	(0.0225)
Children	0.0506	-0.0527*	-0.0181	0.0202
	(0.0328)	(0.0295)	(0.0250)	(0.0173)

Table C - 2 - Continued

Variable	dy/dx			
	High skilled	Skilled non-manual	Skilled manual	Elementary
Mother_tongue (Other only = base)				
Ukranian only	-0.0184	0.0113	0.0371	-0.0300
	(0.0532)	(0.0470)	(0.0533)	(0.0504)
Ukranian and Other	-0.0674	0.0740*	0.0488	-0.0554
	(0.0475)	(0.0423)	(0.0518)	(0.0390)
Russian only	-0.1124**	0.1303***	0.0362	-0.0541
	(0.0455)	(0.0473)	(0.0437)	(0.0395)
BMI	-0.0230	0.0312	0.0088	-0.0170
	(0.0292)	(0.0228)	(0.0233)	(0.0110)
BMI_sq	0.0002	-0.0005	0.0000	0.0003
	(0.0005)	(0.0004)	(0.0004)	(0.0002)
Non-cognitive skills				
Openness	0.0094	-0.0018	0.0126	-0.0202*
	(0.0182)	(0.0167)	(0.0154)	(0.0109)
Conscientiousness	0.0101	0.0009	-0.0168	0.0058
	(0.0182)	(0.0182)	(0.0150)	(0.0101)
Extraversion	0.0055	0.0269*	-0.0399**	0.0075
	(0.0153)	(0.0161)	(0.0159)	(0.0115)
Agreeableness	0.0119	-0.0125	0.0002	0.0003
	(0.0188)	(0.0187)	(0.0203)	(0.0106)
Emotional stability	0.0430***	-0.0266**	-0.0028	-0.0136
	(0.0153)	(0.0141)	(0.0135)	(0.0090)
Decision making	0.0198	-0.0224	0.0153	-0.0127
	(0.0181)	(0.0161)	(0.0180)	(0.0105)
Cognitive skills				
Read	0.1929***	0.0456	-0.0988*	-0.1396***
	(0.0689)	(0.0525)	(0.0592)	(0.0494)
Numeracy	0.0038	0.0121	0.0607	-0.0767
	(0.0558)	(0.0622)	(0.0431)	(0.0489)
Education (Lower than upper secondary = base)				
Upper secondary	-0.1201	0.1804	0.1745*	-0.2347
	(0.1706)	(0.1203)	(0.1031)	(0.1481)
Post-secondary non-tertiary	-0.2874*	0.2598**	0.2241**	-0.1965
	(0.1733)	(0.1234)	(0.1069)	(0.1437)
Tertiary	0.2793	-0.0199	0.0240	-0.2834*
	(0.1705)	(0.1175)	(0.1049)	(0.1508)

Table C - 2 - Continued

Variable	dy/dx			
	High skilled	Skilled non-manual	Skilled manual	Elementary
Mother Education (Lower than upper secondary = base)				
Upper secondary	0.1762***	-0.1729***	-0.0025	-0.0007
	(0.0469)	(0.0600)	(0.0534)	(0.0263)
Post-secondary and higher	0.2505***	-0.1140*	-0.1083**	-0.0282
	(0.0552)	(0.0676)	(0.0563)	(0.0350)
SES (Low = base)				
Middle	0.1464***	-0.0357	-0.1342***	0.0235
	(0.0406)	(0.0421)	(0.0425)	(0.0212)
High	0.2280***	-0.0655	-0.1428***	-0.0198
	(0.0509)	(0.0533)	(0.0497)	(0.0249)
Siblings	-0.0109	-0.0172	0.0228*	0.0053
	(0.0180)	(0.0155)	(0.0133)	(0.0079)
Shocks	0.0229	0.0158	-0.0453	0.0067
	(0.0356)	(0.0359)	(0.0346)	(0.0213)
Parental (Always = base)				
Sometimes	-0.1295***	-0.0181	0.1155***	0.0322
	(0.0385)	(0.0357)	(0.0380)	(0.0236)
No, never or almost never	0.0258	-0.0304	-0.0160	0.0206
	(0.0608)	(0.0536)	(0.0554)	(0.0356)
Father_mother (Lived with father & mother= base)				
Didn't live with father & mother	0.0934	-0.1391	-0.0080	0.0537
	(0.0850)	(0.0940)	(0.1290)	(0.889)
Lived with one	0.0495	-0.0174	-0.0366	0.0045
	(0.0508)	(0.0480)	(0.0472)	(0.0260)
Observations	1027			
PSUs	280			
Log-likelihood	-828.04			
Pseudo R^2	0.36			

Note: Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Regression control for, but not reported region dummies. Standardized scores are used for non-cognitive skills. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the multinomial logit model

Table C - 3. Estimation results for the occupational attainment for males and females separately

Variable	dy/dx			
	High skilled	Skilled non-manual	Skilled manual	Elementary
Male				
Openness	0.018	-0.022	-0.010	-0.006
	(0.024)	(0.023)	(0.026)	(0.023)
Conscientiousness	-0.028	0.051**	-0.009	-0.008
	(0.034)	(0.021)	(0.032)	(0.022)
Extraversion	-0.034	0.058**	-0.026	0.062***
	(0.024)	(0.027)	(0.029)	(0.023)
Agreeableness	-0.026	-0.067**	0.034	-0.001
	(0.030)	(0.031)	(0.035)	(0.016)
Emotional stability	-0.025	0.048	0.032	0.002
	(0.028)	(0.032)	(0.028)	(0.015)
Decision making	0.037	-0.018	0.028	-0.053
	(0.030)	(0.024)	(0.031)	(0.031)
Observations	348	291	348	287
PSUs	186	151	184	150
Log-likelihood	-124.32	-85.26	-171.19	-49.65
Pseudo R^2	0.43	0.23	0.29	0.43
Female				
Openness	0.016	-0.001	0.013	-0.035**
	(0.022)	(0.022)	(0.017)	(0.016)
Conscientiousness	0.007	-0.015	-0.009	0.006
	(0.017)	(0.026)	(0.017)	(0.015)
Extraversion	0.022	0.016	-0.046	0.001
	(0.017)	(0.023)	(0.017)	(0.014)
Agreeableness	0.029	-0.006	-0.022	-0.013
	(0.020)	(0.022)	(0.018)	(0.014)
Emotional stability	0.051***	-0.044**	-0.004	-0.017
	(0.016)	(0.018)	(0.013)	(0.010)
Decision making	0.014	-0.029	0.013	0.006
	(0.019)	(0.023)	(0.024)	(0.014)
Observations	661	629	626	610
PSUs	251	245	235	227
Log-likelihood	-249.67	-272.95	-193.77	-174.08
Pseudo R^2	0.45	0.21	0.22	0.29

Note: The model controls for all variables from Table 7. Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Standardized scores for personality traits are used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the logit model

Table C - 4. Estimation results for multinomial logistic regression (*dependent variable: Sector)*

	dy/dx				
Variable	Agri-culture	Industry and Construct.	Trade, Transport, Accommod ation, Other Services	Public Services	Business Services
Age	-0.0132***	-0.0074	0.0364**	-0.0069	-0.0089**
	(0.0034)	(0.0130)	(0.0153)	(0.0126)	(0.0043)
Age_sq	0.0002***	0.0001	-0.0005***	0.0002	0.0001*
	(0.0000)	(0.0001)	(0.0002)	(0.0001)	(0.0001)
Gender	-0.0143	-0.1696***	-0.1049***	0.0350***	-0.0161
	(0.0110)	(0.0318)	(0.0354)	(0.0352)	(0.0144)
Married	0.0426**	0.0185	-0.0276	-0.0463	0.0129
	(0.0168)	(0.0406)	(0.0450)	(0.0413)	(0.0167)
Children	-0.0049	-0.0057	0.0020	-0.0404	-0.0317**
	(0.0120)	(0.0332)	(0.0346)	(0.0428)	(0.0140)
Mother_tongue (Other only = base)					
Ukranian only	-0.0283	0.0119	-0.0099	-0.0270	0.0533**
	(0.0244)	(0.0657)	(0.0730)	(0.0688)	(0.0242)
Ukranian and Other	-0.0505**	0.0058	0.0777	-0.0556	0.0227
	(0.0202)	(0.0637)	(0.0700)	(0.0648)	(0.0150)
Russian only	-0.0416*	0.0542	0.0897	-0.1357**	0.0334*
	(0.0213)	(0.0596)	(0.0695)	(0.0644)	(0.0178)
BMI	0.0152	-0.0126	-0.0025	-0.0155	0.0153
	(0.0125)	(0.0233)	(0.0231)	(0.0242)	(0.0168)
BMI_sq	-0.0003	0.0003	0.0001	0.0002	-0.0003
	(0.0002)	(0.0004)	(0.0004)	(0.0005)	(0.0003)
Non-cognitive skills					
Openness	-0.0105	-0.0158	-0.0052	0.0137	0.0178
	(0.0074)	(0.0195)	(0.0220)	(0.0218)	(0.0114)
Conscientious.	-0.0123**	0.0268	-0.0107	-0.0072	0.0035
	(0.0059)	(0.0181)	(0.0203)	(0.0183)	(0.0081)
Extraversion	-0.0017	-0.0476***	0.0292	0.0111	0.0091
	(0.0050)	(0.0168)	(0.0187)	(0.0167)	(0.0081)
Agreeableness	0.0033	-0.0155	-0.0193	0.0380**	-0.0065
	(0.0058)	(0.0191)	(0.0195)	(0.0194)	(0.0111)
Emotional stability	0.0192***	-0.0164	-0.0207	0.0036	0.0143**
	(0.0061)	(0.0155)	(0.0170)	(0.0172)	(0.0080)
Decision making	0.0078	0.0142	0.0121	-0.0397*	0.0055
	(0.0064)	(0.0203)	(0.0231)	(0.0228)	(0.0117)

Table C - 4 - Continued

Variable	Agri-culture	Industry and Construct.	dy/dx Trade, Transport, Accommodation, Other Services	Public Services	Business Services
Cognitive skills					
Read	0.0002 (0.0299)	-0.0118 (0.0613)	0.0812 (0.0618)	-0.0698 (0.0745)	0.0002 (0.0364)
Numeracy	0.0123 (0.0191)	0.0194 (0.0530)	0.0893 (0.0675)	-0.1130 (0.0738)	-0.0080 (0.0422)
Education (Lower than upper secondary = base)					
Upper secondary	0.0228** (0.0129)	-0.0791 (0.1493)	0.1984** (0.0772)	-0.1391 (0.1359)	-0.0030 (0.0417)
Post-secondary non-tertiary	0.0049 (0.0133)	-0.1367 (0.1534)	0.2268** (0.0922)	-0.0877 (0.1463)	-0.0072 (0.0411)
Tertiary	0.0246 (0.0183)	-0.1429 (0.1539)	0.0890 (0.0834)	0.0008 (0.1377)	0.0285 (0.0412)
Mother Education (Lower than upper secondary = base)					
Upper secondary	0.0352** (0.0187)	0.1015** (0.0540)	-0.1088 (0.0736)	-0.0465 (0.0586)	0.0186 (0.0122)
Post-secondary and higher	-0.0010 (0.0175)	0.0195 (0.0614)	-0.0956 (0.0776)	0.0259 (0.0621)	0.0512*** (0.0166)
SES (Low = base)					
Middle	0.0261** (0.0116)	-0.0617 (0.0427)	0.0114 (0.0448)	0.0189 (0.0351)	0.0052 (0.0211)
High	0.0048 (0.0098)	-0.0970* (0.0578)	0.0164 (0.0648)	0.1101** (0.0524)	-0.0342 (0.0244)
Siblings	-0.0020 (0.0058)	0.0121 (0.0168)	-0.0040 (0.0212)	0.0088 (0.0171)	-0.0148 (0.0116)
Shocks	0.0123 (0.0112)	-0.0805** (0.0420)	0.0642 (0.0405)	-0.0245 (0.0388)	0.0285 (0.0184)
Parental (Always = base)					
Sometimes	0.0255 (0.0174)	0.0341 (0.0386)	-0.0763* (0.0412)	0.0222 (0.0453)	-0.0055 (0.0201)
No, never or almost never	0.0519 (0.0396)	-0.1461** (0.0673)	0.1424* (0.0780)	-0.0556 (0.0757)	0.0074 (0.0384)

Table C - 4 - Continued

Variable	Agri-culture	Industry and Construct.	dy/dx Trade, Transport, Accommodation, Other Services	Public Services	Business Services
Father_mother (Lived with father & mother= base)					
Didn't live with father & mother	-0.0076 (0.0062)	0.3330** (0.1610)	-0.2369*** (0.0649)	-0.0178 (0.1428)	-0.0708*** (0.0220)
Lived with one	0.0267*** (0.0098)	0.0408 (0.0500)	-0.0071 (0.0560)	-0.0327 (0.0659)	-0.0277 (0.0241)
Observations			737		
PSUs			280		
Log-likelihood			-1100.17		
Pseudo R^2			0.20		

Note: Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Regression control for, but nor reported region dummies. Standardized scores are used for non-cognitive skills. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the multinomial logit model

Table C - 5. Estimation results for *Sector* for males and females separately

Variable	dy/dx				
	Agriculture	Industry and Construct.	Trade, Transport, Accommodation, Other Services	Public Services	Business Services
Male					
Openness	-	-0.060**	0.028	0.006	0.086**
		(0.032)	(0.034)	(0.026)	(0.033)
Conscientiousness	-	0.014	0.010	0.001	0.0001
		(0.035)	(0.034)	(0.021)	(0.019)
Extraversion	-	-0.038	0.022	0.006	-0.005
		(0.030)	(0.030)	(0.022)	(0.020)
Agreeableness	-	0.003	-0.053*	0.085***	0.030
		(0.027)	(0.029)	(0.028)	(0.021)
Emotional stability	-	-0.020	0.031	0.004	0.005
		(0.032)	(0.034)	(0.017)	(0.017)
Decision making	-	-0.013	0.027	-0.042**	-0.017
		(0.028)	(0.032)	(0.022)	(0.022)
Observations	-	350	345	290	201
PSUs	-	184	180	145	111
Log-likelihood	-	-188.09	-167.56	-94.81	-39.57
Pseudo R^2	-	0.22	0.22	0.28	0.29
Female					
Openness	-0.008	-0.016	-0.0002	0.014	0.007
	(0.012)	(0.025)	(0.026)	(0.031)	(0.021)
Conscientiousness	0.023	0.036*	-0.017	-0.013	-0.025
	(0.024)	(0.021)	(0.023)	(0.025)	(0.015)
Extraversion	-0.005	-0.051**	0.033	0.019	0.012
	(0.011)	(0.019)	(0.026)	(0.025)	(0.019)
Agreeableness	0.018	-0.029	-0.017	0.038	-0.011
	(0.017)	(0.025)	(0.025)	(0.028)	(0.016)
Emotional stability	0.018**	0.006	-0.023	-0.007	0.019
	(0.008)	(0.019)	(0.021)	(0.024)	(0.015)
Decision making	-0.007	0.024	0.002	-0.024	0.029
	(0.014)	(0.027)	(0.025)	(0.031)	(0.023)
Observations	317	657	653	670	336
PSUs	129	250	248	253	163
Log-likelihood	-41.14	-319.00	-332.05	-404.15	-81.63
Pseudo R^2	0.35	0.12	0.10	0.12	0.26

Note: The model controls for all variables from Table B-3. Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Standardized scores for personality traits are used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the logit model

Table C - 6. Multivariate probit model. Correlation coefficients between residuals of employment and personality traits

Equations compared	Correlation coefficient	Standard error
Employment - extraversion	0.070*	0.037
Employment - openness	0.063*	0.037
Employment - conscientiousness	0.149***	0.038
Employment – emotional stability	0.081**	0.037
Employment – agreeableness	0.076**	0.038
Employment – decision making	0.065*	0.038

Note: The model shows result from equation 3.5. Bootstrapped standard errors are reported. The sample excludes individuals below 25 years. Standardized scores of personality traits are recorded to binomial from. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table C - 7. Multivariate probit model. Correlation coefficients between residuals of occupation and personality traits

Equations compared	High-skilled	Skilled non-manual	Skilled manual	Elementary
Extraversion	0.058	0.046	-0.072	-0.074
	(0.051)	(0.052)	(0.052)	(0.058)
Openness	0.131**	-0.066	0.028	-0.100*
	(0.052)	(0.054)	(0.054)	(0.059)
Conscientiousness	0.069	-0.079	0.097*	-0.035
	(0.053)	(0.052)	(0.053)	(0.058)
Emotional stability	0.090*	-0.084	0.021	0.023
	(0.052)	(0.054)	(0.053)	(0.059)
Agreeableness	0.067	0.002	-0.048	-0.134**
	(0.052)	(0.053)	(0.054)	(0.059)
Decision making	0.103**	0.033	0.016	-0.089
	(0.052)	(0.054)	(0.056)	(0.061)

Note: The model shows result from equation 3.5 for each level of *occupation*. Bootstrapped standard errors are reported. The sample excludes individuals below 25 years. Standardized scores of regression-corrected personality traits are recorded to binomial form. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C - 8. Multivariate probit model. Correlation coefficients between residuals of sector and personality traits

Equations compared	Agricult.	Industry and Construct.	Trade, Transport, Accommodation, Other Services	Public Services	Business Services
Extraversion	-0.003	-0.165***	0.089*	0.061	0.048
	(0.067)	(0.048)	(0.049)	(0.050)	(0.065)
Openness	-0.148**	-0.029	0.011	-0.002	-0.023
	(0.068)	(0.050)	(0.050)	0.051	(0.066)
Conscient.	-0.132*	0.094*	-0.044	-0.032	0.014
	(0.068)	(0.051)	(0.050)	(0.051)	(0.064)
Emotional stability	0.083	0.050	-0.116**	0.005	0.067
	(0.067)	(0.050)	(0.049)	(0.050)	(0.063)
Agreeabl.	-0.048	-0.029	-0.068	0.125**	0.085
	(0.067)	(0.050)	(0.049)	(0.050)	(0.066)
Decision making	-0.103	0.019	0.019	0.026	-0.030
	(0.074)	(0.052)	(0.051)	(0.052)	(0.071)

Note: The model shows result from equation 3.5 for each level of *sector*. Bootstrapped standard errors are reported. The sample excludes individuals below 25 years. Standardized scores of regression-corrected personality traits are recorded to binomial form. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table C - 9. Effects of regression-adjusted personality traits on employment status

Variable	Dy/dx					
	With education			Without education		
	All	Male	Female	All	Male	Female
Openness	0.038***	0.070***	0.026	0.043***	0.069***	0.033*
	(0.014)	(0.021)	(0.018)	(0.014)	(0.021)	(0.018)
Conscient.	0.024*	0.015	0.036**	0.024*	0.014	0.036**
	(0.013)	(0.020)	(0.015)	(0.013)	(0.019)	(0.015)
Extraversion	-0.006	0.001	-0.008	-0.007	0.001	-0.009
	(0.013)	(0.022)	(0.017)	(0.014)	(0.022)	(0.017)
Agreeableness	-0.003	-0.010	0.004	-0.005	-0.009	0.002
	(0.015)	(0.020)	(0.018)	(0.015)	(0.019)	(0.018)
Emot. stability	0.043***	0.037	0.033**	0.044***	0.037*	0.034**
	(0.014)	(0.022)	(0.015)	(0.014)	(0.022)	(0.016)
Dec. making	-0.018	-0.013	-0.023	-0.016	-0.011	-0.021
	(0.014)	(0.025)	(0.019)	(0.014)	(0.025)	(0.019)
Observations	1,850	583	1,254	1,850	583	1,254
Log-likelihood	-972.44	-273.61	-667.11	-975.50	-273.99	-670.73
Pseudo R^2	0.22	0.25	0.22	0.22	0.25	0.22

Note: The model controls for all variables from Table B-3. Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Socio-emotional skills are the predicted residuals from the regressions of the Big Five on age, age squared, age cubed (for male and female regressions) and gender for *all*. The predicted residuals are standardized. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the logit model

Table C - 10. Effects of regression-adjusted personality traits on occupational attainment

Variable	dy/dx			
	High skilled	Skilled non-manual	Skilled manual	Elementary
Openness	0.009	-0.001	0.013	-0.020*
	(0.018)	(0.017)	(0.015)	(0.011)
Conscientiousness	0.010	0.001	-0.017	0.005
	(0.018)	(0.018)	(0.015)	(0.010)
Extraversion	0.005	0.026*	-0.039**	0.007
	(0.015)	(0.016)	(0.016)	(0.011)
Agreeableness	0.011	-0.012	0.001	0.0001
	(0.018)	(0.018)	(0.020)	(0.010)
Emotional stability	0.043***	-0.026*	-0.002	-0.013
	(0.015)	(0.014)	(0.013)	(0.008)
Decision making	0.019	-0.022	0.015	-0.013
	(0.018)	(0.016)	(0.018)	(0.010)
Observations	1027			
Log-likelihood	-828.04			
Pseudo R^2	0.36			

Note: The model controls for all variables from Table B-3. Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Socio-emotional skills are the predicted residuals from the regressions of the Big Five on age, age squared, age cubed and gender. The predicted residuals are standardized. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the logit model

Table C - 11. Effects of regression-adjusted personality traits on sector

Variable	dy/dx				
	Agriculture	Industry and Construct.	Trade, Transport, Accommodation, Other Services	Public Services	Business Services
Openness	-0.010	-0.015	-0.005	0.013	0.018
	(0.007)	(0.019)	(0.022)	(0.022)	(0.011)
Conscientiousness	-0.012**	0.025	-0.010	-0.006	0.004
	(0.006)	(0.018)	(0.020)	(0.018)	(0.008)
Extraversion	-0.002	-0.047***	0.029	0.011	0.009
	(0.005)	(0.017)	(0.019)	(0.016)	(0.008)
Agreeableness	0.003	-0.014	-0.019	0.037**	-0.006
	(0.006)	(0.019)	(0.019)	(0.019)	(0.011)
Emotional stability	0.018***	-0.016	-0.020	0.003	0.014**
	(0.006)	(0.015)	(0.017)	(0.017)	(0.008)
Decision making	0.008	0.014	0.012	-0.039*	0.005
	(0.006)	(0.020)	(0.023)	(0.022)	(0.011)
Observations	1025				
Log-likelihood	-1100.27				
Pseudo R^2	0.20				

Note: The model controls for all variables from Table B-3. Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Socio-emotional skills are the predicted residuals from the regressions of the Big Five on age, age squared, age cubed and gender. The predicted residuals are standardized. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the logit model

Table C - 12. Robustness check. Effects of personality traits on employment status with interaction terms

Variable	Dy/dx	
	With gender*married	With gender*children
Openness	0.037***	0.040***
	(0.014)	(0.014)
Conscient.	0.024*	0.025*
	(0.013)	(0.013)
Extraversion	-0.006	-0.006
	(0.013)	(0.013)
Agreeableness	-0.002	-0.005
	(0.015)	(0.015)
Emotional stability	0.043***	0.042***
	(0.014)	(0.014)
Decision making	-0.019	-0.017
	(0.014)	(0.014)
Observations	1,850	1,850
Log-likelihood	-971.22	-968.49
Pseudo R^2	0.22	0.22

Note: The model controls for all variables from Table B-3. Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Regressions are estimated for the whole population. Standardized scores are used for non-cognitive skills. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Log-likelihood and pseudo R^2 are reported for the multinomial logit model

Table C - 13. Robustness check. Effects of personality traits on occupational attainment with interaction terms

Variable	dy/dx			
	High skilled	Skilled non-manual	Skilled manual	Elementary
*With gender*married*				
Openness	0.010	-0.002	0.013	-0.020*
	(0.018)	(0.017)	(0.015)	(0.011)
Conscientiousness	0.008	0.002	-0.015	0.005
	(0.018)	(0.018)	(0.015)	(0.010)
Extraversion	0.005	0.026*	-0.040**	0.007
	(0.016)	(0.016)	(0.016)	(0.011)
Agreeableness	0.013	-0.014	0.001	0.0005
	(0.018)	(0.018)	(0.020)	(0.010)
Emotional stability	0.041***	-0.025*	-0.001	-0.013
	(0.015)	(0.014)	(0.013)	(0.008)
Decision making	0.019	-0.021	0.016	-0.013
	(0.018)	(0.016)	(0.018)	(0.010)
Log-likelihood	-826.28			
*With gender*children*				
Openness	0.017	-0.005	0.009	-0.020*
	(0.018)	(0.017)	(0.015)	(0.011)
Conscientiousness	0.009	0.002	-0.017	0.006
	(0.017)	(0.017)	(0.015)	(0.010)
Extraversion	0.006	0.024*	-0.039**	0.008
	(0.015)	(0.016)	(0.016)	(0.012)
Agreeableness	0.008	-0.012	0.003	0.0001
	(0.019)	(0.019)	(0.021)	(0.010)
Emotional stability	0.042***	-0.024*	-0.002	-0.014
	(0.015)	(0.014)	(0.013)	(0.008)
Decision making	0.019	-0.022	0.014	-0.012
	(0.017)	(0.016)	(0.018)	(0.010)
Log-likelihood	-825.12			

Note: The model controls for all variables from Table B-3. Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Regressions are estimated for the whole population. Standardized scores are used for non-cognitive skills. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. N=1027. Pseudo $R^2 = 0.36$

Table C - 14. Robustness check. Effects of personality traits on the economic sector with interaction terms

	dy/dx				
Variable	Agriculture	Industry and Construct.	Trade, Transport, Accommodation, Other Services	Public Services	Business Services
*With gender*married*					
Openness	-0.010	-0.015	-0.006	0.014	0.018
	(0.007)	(0.019)	(0.022)	(0.021)	(0.010)
Conscientiousness	-0.012**	0.026	-0.007	-0.007	0.007
	(0.006)	(0.018)	(0.019)	(0.018)	(0.008)
Extraversion	-0.002	-0.048***	0.031	0.010	0.009
	(0.005)	(0.017)	(0.018)	(0.016)	(0.008)
Agreeableness	0.003	-0.014	-0.019	0.037**	-0.003
	(0.006)	(0.019)	(0.019)	(0.019)	(0.010)
Emotional stability	0.019***	-0.017	-0.018	0.003	0.014**
	(0.006)	(0.015)	(0.017)	(0.017)	(0.008)
Decision making	0.007	0.013	0.015	-0.039*	0.004
	(0.006)	(0.021)	(0.023)	(0.023)	(0.011)
Log-likelihood			-1097.68		
*With gender*children*					
Openness	-0.012	-0.015	-0.007	0.015	0.020
	(0.007)	(0.019)	(0.022)	(0.022)	(0.011)
Conscientiousness	-0.012**	0.026	-0.012	-0.006	0.005
	(0.006)	(0.018)	(0.020)	(0.018)	(0.008)
Extraversion	-0.001	-0.047***	0.029	0.011	0.009
	(0.005)	(0.017)	(0.019)	(0.016)	(0.008)
Agreeableness	0.004	-0.015	-0.018	0.037**	-0.007
	(0.006)	(0.019)	(0.019)	(0.019)	(0.011)
Emotional stability	0.020***	-0.017	-0.020	0.004	0.013**
	(0.006)	(0.015)	(0.017)	(0.017)	(0.008)
Decision making	0.007	0.015	0.013	-0.040*	0.005
	(0.006)	(0.020)	(0.023)	(0.023)	(0.012)
Log-likelihood			-1098.08		

Note: The model controls for all variables from Table B-3. Delta-method standard errors are reported in parentheses. The sample excludes individuals below 25 years. The Table shows marginal effects at mean values using Stata Survey commands. Regressions are estimated for the whole population. Standardized scores are used for non-cognitive skills. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. N=1025. Pseudo $R^2 = 0.20$

Table C - 15. Percentage of total effect of personality traits on employment explained by family background mediators

P_Reduced	Extraver.	Agreeabl.	Conscien.***	Stability**	Openness	Decision
Mother Education (Lower than upper secondary = base)						
Upper secondary	75.45	4.76	2.26	0.13	-6.95	-2.9
Post-secondary and higher	-0.68	-0.01	-0.04	-0.03	-0.04	0.01
Parental (Always = base)						
Sometimes	-22.62	5.88	2.58	-0.22	14.16	3.42
No, never or almost never	-27.79	3.57	-4.2	0.98	7.03	-1.78
Father_mother (Didn't live with father & mother = base)						
Lived with father & mother	-15.71	2.65	-1.82	-4.11	-2.93	8.59
Lived with one	4.3	-6.51	4.12	6.52	3.02	-10.29
SES (Low = base)						
Middle	1.34	1.41	-0.18	1.09	-1.93	2.3
High	11.09	-9.28	-0.82	0.41	11.15	-8.38
Siblings	5.72	-8.12	-2.02	2.27	0.7	-7.41
Shocks	92.07	6.03	-2.1	-4.83	-8.33	-2.87

Note: The model controls for demographic variables and cognitive skills from Table B-3. The sample excludes individuals below 25 years. The Table shows components of difference using KHB method with bootstrap option. Standardized scores for personality traits are used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (in the decomposition). N = 1872

Table C - 16. Percentage of total effect of personality traits on occupation explained by family background mediators

P_Reduced	Extrav.	Agreeab.	Consc.	Stabil.**	Open.**	Decis.**
			High-skilled			
Mother Education (Lower than upper secondary = base)						
Upper secondary	3.97	207.04	57.86	-5.52	3.24	1.74
Post-secondary and higher	-4.09	-210.15	-203.73	8.8	3.98	-7.08
Parental (Always = base)						
Sometimes	-2.67	-190.57	-323.29	-2.38	10.48	1.86
No, never or almost never	4.59	33.64	-82.95	2.41	-1.98	1.53
Father_mother (Didn't live with father & mother = base)						
Lived with father & mother	2.44	-9.18	-43.77	2.17	-0.46	-4.3
Lived with one	-0.35	-3.21	13.27	-0.42	0.09	0.61
SES (Low = base)						
Middle	2.88	22.86	-94.14	6.01	0.35	2.33
High	3.23	52.73	100.63	-4.26	5.87	-7.31
Siblings	2.37	96.63	260.18	3.16	1.87	-2.06
Shocks	0.18	0.3	2.04	-0.12	0	-0.01
P_Reduced	Extraver.	Agreeab.	Conscien.	Stability	Openness	Decision
			Skilled non-manual			
Mother Education (Lower than upper secondary = base)						
Upper secondary	-1.92	115.41	-2.57	14.63	-6.27	-1.96
Post-secondary and higher	-0.39	23.12	-1.79	4.6	1.52	-1.58
Parental (Always = base)						
Sometimes	-0.88	72.48	-9.82	-4.31	13.87	1.44
No, never or almost never	2.65	-22.3	-4.39	7.58	-4.56	2.06

Table C - 16 - Continued

Father_mother (Didn't live with father & mother = base)						
Lived with father & mother	4.9	21.16	-8.05	23.81	-3.71	-20.08
Lived with one	-3.51	36.88	12.15	-23.09	3.5	14.11
SES (Low = base)						
Middle	1.01	-9.18	-3.02	11.47	0.49	1.9
High	1.13	-21.22	3.23	-8.15	8.21	-5.96
Siblings	1.14	-53.48	11.49	8.31	3.6	-2.31
Shocks	-1.83	3.49	-1.92	6.65	-0.01	0.27
P_Reduced	Extraver.	Agreeab.	Conscien.	Stability	Open.*	Decision
			Skilled manual			
Mother Education (Lower than upper secondary = base)						
Upper secondary	-0.07	0.87	0.09	-0.24	0.09	0.04
Post-secondary and higher	-0.46	5.97	2.25	-2.62	-0.75	1.14
Parental (Always = base)						
Sometimes	-0.3	5.3	3.5	0.69	-1.93	-0.29
No, never or almost never	-6.07	11.15	-10.7	8.34	-4.34	2.87
Father_mother (Didn't live with father & mother = base)						
Lived with father & mother	-3.84	-3.62	-6.71	8.96	-1.21	-9.58
Lived with one	2.23	-5.11	8.21	-7.04	0.92	5.45
SES (Low = base)						
Middle	1.48	-2.94	4.71	-8.08	-0.3	-1.69
High	0.27	-1.12	-0.83	0.94	-0.82	0.88
Siblings	-1.39	14.26	14.94	4.88	1.83	-1.71
Shocks	2.94	-1.22	-3.29	5.13	-0.01	0.26

Note: The model controls for demographic variables and cognitive skills from Table B-3. The sample excludes individuals below 25 years. The Table shows components of difference using KHB method with bootstrap option. Standardized scores for personality traits are used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (in the decomposition). N = 1033. Elementary group is a baseline.

Table C - 17. Percentage of total effect of personality traits on economic sector explained by family background mediators

P_Reduced	Extraver.	Agreeabl.	Conscien.	Stabil.*	Openness	Decision
Industry and Construction						
Mother Education (Lower than upper secondary = base)						
Upper secondary	5.72	-5.66	3.07	-3.33	-10	-9.71
Post-secondary and higher	0.02	1.36	-1.44	1.05	-1.8	5.59
Parental (Always = base)						
Sometimes	-1.17	-1.17	1.61	0.41	7.83	-0.77
No, never or almost never	-9.24	2.25	7.13	-3.93	-26.08	12.43
Father_mother (Didn't live with father & mother = base)						
Lived with father & mother	33.52	10.26	-44.04	35.57	47.7	188.93
Lived with one	-19.45	-5.09	57.36	-31.47	-38.97	-175.94
SES (Low = base)						
Middle	0.45	0.1	-0.16	0.29	0.49	-0.23
High	-0.26	-0.2	0.09	-0.21	-1.26	0.62
Siblings	-1.23	1.96	-3.23	-1.81	3.65	-1.68
Shocks	2.63	0.11	1.07	-1.12	1.11	0.88
P_Reduced	Extraver.	Agreeabl.*	Conscien.	Stab.**	Openness	Decision
Trade, Transport, Accommodation and Other Services						
Mother Education (Lower than upper secondary = base)						
Upper secondary	-14.2	-8.46	6.56	-3.93	-10.69	-22.1
Post-secondary and higher	-0.02	0.82	-1.25	0.5	-0.78	5.15
Parental (Always = base)						
Sometimes	2.18	-1.31	2.59	0.37	6.29	-1.32
No, never or almost never	9.68	1.42	6.44	-1.96	-11.78	11.93
Lived with father & mother	-50.43	9.28	-57.13	25.44	30.92	260.39

Table C - 17 - Continued

Father_mother (Didn't live with father & mother = base)						
Lived with one	28.18	-4.44	71.64	-21.67	-24.33	-233.48
SES (Low = base)						
Middle	1.29	-0.17	0.39	-0.39	-0.59	0.58
High	-3.03	1.41	-0.9	1.13	6.2	-6.5
Siblings	1.6	1.53	-3.62	-1.12	2.04	-2
Shocks	0.92	-0.02	-0.32	0.18	-0.17	-0.28
P_Reduced	Extraver.	Agreeabl.*	Conscien.	Stabil.*	Openness	Decision
Public Services						
Mother Education (Lower than upper secondary = base)						
Upper secondary	51.18	-29.24	7.74	-6.69	-12.16	51.18
Post-secondary and higher	0.07	2.62	-1.36	0.79	-0.82	0.07
Parental (Always = base)						
Sometimes	-7.3	-4.19	2.84	0.58	6.63	-7.3
No, never or almost never	-35.24	4.94	7.68	-3.36	-13.52	-35.24
Father_mother (Didn't live with father & mother = base)						
Lived with father & mother	164.84	29.08	-61.1	39.24	31.88	164.84
Lived with one	-94.27	-14.23	78.44	-34.22	-25.67	-94.27
SES (Low = base)						
Middle	-3.83	-0.47	0.38	-0.55	-0.56	-3.83
High	10.87	4.84	-1.05	1.91	7.01	10.87
Siblings	-2.47	2.27	-1.83	-0.81	1	-2.47
Shocks	11.61	0.28	1.33	-1.11	0.66	11.61

Table C - 17 - Continued

P_Reduced	Extraver.	Agreeabl.	Conscien.	Stability	Open.*	Decision
			Business Services			
Mother Education (Lower than upper secondary = base)						
Upper secondary	-6.46	-5.74	4.92	-9.93	-4.69	-6.46
Post-secondary and higher	0.03	-1.7	2.84	-3.87	1.04	0.03
Parental (Always = base)						
Sometimes	3.04	-2.72	5.94	2.82	8.44	3.04
No, never or almost never	2.7	0.59	2.96	-3.03	-3.17	2.7
Father_mother (Didn't live with father & mother = base)						
Lived with father & mother	1.25	-0.34	2.34	-3.52	-0.74	1.25
Lived with one	-1.63	0.38	-6.82	6.95	1.36	-1.63
SES (Low = base)						
Middle	-0.75	0.14	-0.38	1.26	0.33	-0.75
High	1.89	-1.31	0.92	-3.91	-3.73	1.89
Siblings	3.25	4.65	-12.12	-12.59	4	3.25
Shocks	0.11	0	-0.06	0.12	-0.02	0.11

Note: The model controls for demographic variables and cognitive skills from Table B-3. The sample excludes individuals below 25 years. The Table shows components of difference using KHB method with bootstrap option. Standardized scores for personality traits are used. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$ (in the decomposition). N = 1031. Agriculture is a base category.