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Gender Differences in Personality and Earnings: Evidence from Russia

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Abstract

Does personality affect earnings? If so, are there gender differences in personality that explain part of the gender wage gap? We use survey data collected from over 2,600 Russian employees between 2000 and 2003 to evaluate the impact on earnings of two personality traits: locus of control (Rotter 1966) and challenge-affiliation (Hill *et al.* 1985). We find that gender differences in personality traits are significant. Men are more likely to exhibit an internal locus of control and need for challenge, while women are more likely to exhibit an external locus of control and need for affiliation. Moreover, there are differences in the effect of personality on earnings by gender – women's earnings are affected by personality, while men's earnings are not. Among participating employees in our study, the "unexplained" portion of the gender wage gap falls by as much as 12% when personality traits are included.

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Key words: Personality; Locus of control; Earnings; Gender wage gap; Russias

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1. Introduction

There is a substantial interest to the problem of gender earnings gap in the economic literature. The issue has been studied in application to many countries, and a common feature of these studies is the rather large difference in earnings of men and women (see Blau 1998, Gunderson 1989 1994, Jarrell and Stanley 2004, Newell and Reilly 2001 for the surveys and recent trends). Wage decomposition analysis performed in these studies shows that part of the earnings gap can be explained by differences in cognitive abilities and observed productivity characteristics, such as work experience and education. However, a significant portion of the gap remains unexplained and is usually attributed to sex discrimination.

An alternative interpretation of the unexplained earnings gap involves a failure to account for non-cognitive productivity factors that affect earnings, motivation and personality[1] being important examples. Linkages between personality traits and labor market performance measures are well-established, whether performance is measured by earnings (Andrisani 1977 1981, Bowles *et al.* 2001a 2001b, Duncan and Morgan 1981, Dunifon and Duncan 1998, Filer 1981, Goldsmith *et al.* 2000, Mueller and Plug 2004, Nyhus and Pons 2004, Osborne 2000), employment (Baum *et al.* 1986, Goldsmith *et al.* 1996), entrepreneurial talent (Hansemark 2003, Mueller 2004, Thomas and Mueller 2000), productivity (Barrick and Mount 1991, Coleman and DeLeire 2003, Kirkcaldy *et al.* 2002, Mitchell *et al.* 1975, Salgado 1997), or promotions (Bowles *et al.* 2001a, Judge *et al.* 1999). The two specific personality traits that have consistently been linked to differences in a variety of performance measures are locus of control, [2] and the need for challenge or affiliation. Locus of control (LOC) refers to one's perception of the relationship between one's behavior and its consequences (Rotter 1966). Individuals who believe that the outcomes they experience are consequences of their own behavior, ability or effort are defined as exhibiting an *internal* LOC.

[1] There appears to be a discrepancy in the psychology and economics literatures in the wording used to capture non-cognitive abilities or characteristics, especially with regard to the use of personality, personality traits, and attitudes. Among psychologists, personality encompasses a wide variety of personality traits, and is established relatively early in life, remaining stable over time. Attitudes – mental or emotional "positions" or "states"– tend to be viewed as less enduring and more singular in nature than personality. Economists tend to use attitudes to designate all non-cognitive traits.

[2] A large literature based on surveys conducted in Australia, Britain, Germany, Japan, and the U.S. documents a strong relationship between locus of control (LOC) and a variety of work-related characteristics: motivation, effort, productivity, job satisfaction, experience with unemployment, job-related stress, feelings of job insecurity, entrepreneurship, supervisory style, participation in teams, and responses to particular management techniques. See, for example, Andrisani (1977 1981), Bandura (1989), Coleman and DeLeire (2003), Garson and Stanwyck (1997), Goldsmith *et al* (1996), Hansemark (2003), Kirkcaldy *et al* (2002), Mitchell *et al* (1975), Seligman (1975), Skinner *et al* (1998), Spector (1982).

Individuals who exhibit an *external* LOC believe that the outcomes they experience are a function of luck or fate or other factors that are beyond their control or manipulation. Rotter (1966) argues that people with *internal* LOC rely more on their own actions, exhibit greater initiative and hence are more successful. Studies involving individuals in developed market economies tend to support this general proposition, as they find that employees exhibiting an *internal* LOC perform better – are both more motivated and more productive – than those exhibiting an *external* LOC (Bandura and Cervone 1983, Baum *et al.* 1986, Goldsmith *et al.* 2000, Harter 1978, Heckhausen 1991, Skinner 1996).

Studies that include challenge-affiliation (C-A) tend to include more diverse measures than studies which include locus of control. Following Turner and Martinez (1977), Hill *et al.* (1985) Hofstede (1998), and Osborne (2000), we take the view that *challenge* is associated with "getting ahead," and *affiliation* is associated with "getting along."[3] This literature suggests that individuals with preference for challenge are highly motivated and more likely to undertake demanding tasks; thus, they are expected to perform better in the labor market. Limited evidence in support of this proposition is found in Hill *et al.* (1985).

Gender differences in personality also are well-documented (Eagley 1987, Feingold 1994, Hofstede 1998, Schultheiss 2001, Sherman *et al.* 1997, Smith *et al.* 1997, Williams and Best 1982 1990), although there remains some debate about the extent or magnitude of gender differences in personality. Mueller (2004), using survey data collected from university students in seventeen countries, finds no statistically significant difference between men and women in terms of LOC. Costa *et al.* (2001), Sherman *et al.* (1997), Smith *et al.* (1997) and others do find gender differences in LOC – women tend to be *external*, men tend to be *internal*. McClelland (1975), McClelland *et al.* (1976), Schultheiss (2001), and others find that women score higher on need for *affiliation* than men. However, we note that several studies find that when aggression or challenge is defined to include factors other than overt physical behavior, women are likely to exhibit this personality trait (Feshbach and Sones 1971, Mallick and McCandless 1966, Crick and Grotpeter 1995, Putrevu 2001).

The discussed literature suggests that the observed gender differences in earnings may partly be due to personality differences in men and women. However, studies of this issue are

[3] Challenge and aggression are frequently used interchangeably, as are agreeableness and affiliation.

rather scarce. Two recent studies focus explicitly on whether gender differences in personality as measured by characteristics (traits) included the Five-Factor Model[4] contribute to gender differences in earnings. Nyhus and Pons (2004) test the extent to which certain personality characteristics are rewarded in the labor market in order to assess the contribution of personality differences to the unexplained variance in earnings. Using a large sample of the Dutch population, they find gender-specific returns associated with personality characteristics. Mueller and Plug (2004) use data from a longitudinal survey of U.S. high school graduates to estimate the effect of personality on male-female earnings. They find: (1) significant gender differences in personality characteristics; (2) overall, the impact of personality on earnings is comparable to the impact of differences in cognitive ability – significant but not large; (3) particularly important are the gender-atypical traits.

Why does it matter if gender differences in personality contribute to differences in earnings? Including personality along with standard demographic characteristics and human capital variables in determinants of wage variation may help to explain a greater portion of the unexplained component of wage variation (Bowles *et al.* 2001, Earl 1990), as well as the unexplained differences in earnings between men and women. It may also permit assessments of which personality traits matter most to earnings (or job satisfaction, job performance), and whether this varies by gender, sector, or occupation. Such information is useful for employees in their job search efforts – what characteristics make for a good job match? Such information is useful to employers interested in a good job match, high job satisfaction, low labor turnover, and good job performance of their employees. Such information is useful for policy makers who are interested in reducing the gender wage gap.

We investigate the impact of gender differences in personality on gender differences in earnings using Russian data. There is a solid evidence of the large gender earnings gap in Russia (see Arabsheibani and Lau 1999, Brainerd 2000, Clarke 2002, Deloach and Hoffman 2002, Gerry *et al.* 2004, Glinskaya and Mroz 2000, Jovanovic and Lokshin 2004, Linz 1995 1996, Newell and Reilly 1996, Newell and Reilly 2001, Ogloblin 1999, Reilly 1999, Satre-Ahlander 2001). Moreover, a significant portion of this gap cannot be explained by differences in accumulated human capital and other observed characteristics (Arabsheibani and Lau 1999, Gerry *et al.* 2004,

[4] The Five-Factor Model is a grouping of nearly two thousand items into five clusters or categories: Neuroticism, Extroversion, Openness to Experience, Agreeableness, Conscientiousness (Costa and McCrae 1992, Goldberg 1992).

Glinskaya and Mroz 2000, Newell and Reilly 1996, Ogloblin 1999]. We hypothesize that a portion of the unexplained differential may be explained if personality is included in the earnings specification, where the considered personality traits are LOC and C-A. Unlike most previous studies, which focus on differences in experience and educational qualifications, we consider the role of personality characteristics in explaining the gender differences in earnings.

Based on the existing literature, we develop six hypotheses regarding gender differences in personality and earnings. Our first two hypotheses focus on gender differences in personality traits:

H1: Men are more likely than women to be *internal*.

H2: Men are more likely than women to exhibit a need for *challenge*.

Our second two hypotheses focus on personality differences and earnings:

H3: Individuals with an *internal* LOC are more likely to have higher earnings than individuals with an *external* LOC.

H4: Individuals who exhibit a need for *challeng*e are more likely to have higher earnings than those who exhibit a need for *affiliation*.

Because our primary objective is to assess the influence of gender differences in personality on gender differences in earnings, we consider the following two hypotheses:

H5: Gender differences in personality contribute to gender differences in earnings.

H6: The unexplained component of wage variation is reduced when personality traits are included.

Our investigation of the impact of gender differences in personality on gender differences in earnings is divided into six parts. Section 2 provides an overview of the survey and briefly describes the data used to test our hypotheses. Section 3 explains how we construct the measures used to capture the two personality traits employed in our analysis: locus of control (LOC), and need for challenge or affiliation (C-A). Here we also provide the descriptive analysis of gender differences in personality. In section 4 we examine the relationship between personality and earnings using the descriptive and regression analyses. Section 5 explains how we assess gender differences in earnings due to gender differences in personality by employing Oaxaca-Blinder-Neumark earnings gap decomposition and presents the resulting estimates. Section 6 offers concluding remarks.

2. Data

We utilize survey data collected from over 2,600 Russian employees to investigate the relationship between personality traits and earnings. The first employee survey was conducted in May and June of 2000 in Taganrog[5] and Saratov[6]. The second survey was conducted in 2002 in Taganrog[7] and several neighboring cities;[8] the third in Ekaterinburg and neighboring cities in 2003.[9]

Because economic, political, and social conditions remained relatively stable and were generally improving in Russia between 2000 and 2003, we do not think the timing of the surveys will generate differences in response patterns. We do think, however, that regional differences might be significant. According to Rosstat,[10] the Rostov-on-Don (which includes Taganrog) and Saratov regions have significantly more people affiliated with agricultural production than the Sverdlovsk region (which includes Ekaterinburg): 22% and 20%, compared to 9%, respectively. Studies using the Russian Longitudinal Monitoring Survey (RLMS), a nationally representative

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[5] Taganrog, a port city on the Azov Sea and formerly a "closed" city, has been identified by Soviet and Russian researchers as the "average" or "typical" city – the Peoria of Russia and the former Soviet Union (Grushin 1980, Chichilymov 1995, Rimashevskaya 1997). Located in the Rostov-on-Don region, Taganrog's current population is about 300,000. We thank Anatoly Nepomnyshy for assistance with data collection.

[6] Saratov, with a current population of about 0.9 million, is located on the Volga River in western Russia. Saratov is known as the country's main supplier of trolleybuses and producer of modified "YAK-42" aircraft. We thank Rouben Atoian for assistance with data collection in Saratov.

[7] Although the survey was conducted twice in Taganrog, each time different workplaces were included and thus to the best of our knowledge different individuals completed the questionnaires. Consequently, for Taganrog we have repeated cross-section rather than longitudinal data. Since we cannot guarantee that each of the Taganrog surveys is representative of the same subgroup of the city population, we treat the two Taganrog samples independently and report results separately for the two years.

[8] By design, in 2002, the majority of the participating workplaces (86%) were located in Taganrog; one workplace was located in Rostov, and three in Azov. Rostov, located on the Don River and about 60 kilometers from Taganrog, has a current population of about 1 million. Azov, also a port city, has a current population of less than 100,000. We thank Inna Petrova for her assistance in coordinating the data collection process in the Taganrog 2002 survey.

[9] We thank Inna Maltseva for her assistance in coordinating the data collection and data entry process tor the Ekaterinburg survey. Ekaterinburg, located in the Urals and known as Sverdlovsk between 1924 and 1992, is one of the largest industrial regions in the country. Formerly a "closed" city because of the concentration of militaryrelated production, Ekaterinburg has a current population of 1.5 million. All but four workplaces included in the 2003 survey were located in Ekaterinburg. Polevskoy, where two workplaces were located, is on the outskirts of Ekaterinburg. The two remaining workplaces in the "Ekaterinburg survey" were located in Chelyabinsk and Tomsk. Chelyabinsk, with a current population of 1.2 million, like Ekaterinburg is a major industrial center (metallurgy, steel pipe, farm and military vehicles) in the Urals and also was formerly a "closed" city. Tomsk, located in Western Siberia and once known for its gold mining, has a current population of 480,000 people.

[10] Rosstat is Russia's Federal Statistical Agency (former Goskomstat). Its official website is http://www.fsgs.ru.

sample of Russian households, document dramatic differences in work experiences and opinions between individuals in the agricultural and non-agricultural sectors (Petrin 2004, Mroz *et al.* 2002). More generally, RLMS data also document significant rural-urban differences in work experiences and opinions. Given the rural-urban composition of the regions participating in our survey – urban residents account for 80% of the population of Sverdlovsk region, 73% of the population in Saratov region, and 57% of the population of Rostov region – we anticipate regional differences in attitudes. Regional differences in attitudes and values among Russians, as well as between Russians and other ethnic groups, are well-documented in the political science and sociology literatures that focus on Russia and the former Soviet Union (see Kolsto and Blakkisrud 2004 for a recent literature review). Therefore, when conducting our analyses and reporting our results we utilize "Taganrog1," "Saratov," "Taganrog2" and "Ekaterinburg" for identification purposes (see also footnote 7).

A core set of questions was included in each survey. The core set included questions which focused on socio-demographic and employment data (age, gender, education, earnings, job tenure, promotions at current workplace, recent job change, recent experience with unemployment), as well as questions which focused on attitudes and expectations that have been shown to influence performance (job satisfaction, organizational loyalty, attitudes toward work in general, relative importance of particular rewards[11], expectations of receiving a desired reward, among others). In addition, in 2002 and 2003, we collected data on ownership type and type of product or service produced by the workplace. Consequently, for these two surveys, we are able to control for the influence of workplace characteristics – ownership and sector – on our results.

In each survey, the questionnaires were distributed among employees at selected enterprises. When asked to participate in the survey, potential respondents were informed about the confidentiality and anonymity of their participation, and, if they elected to participate, were given the option of choosing not to complete the survey instrument. A detailed description of the data collection process is provided in Linz (2004).

[11] In the Taganrog1 and Saratov surveys, for the set of eleven questions asking participants to identify the relative importance of a particular "reward," workers were asked to evaluate the degree of importance of each item for themselves, while managers were asked to evaluate the degree of importance of the same items for their workers. For the purposes of this analysis, we assume that managers believe their workers desire the same things as they do; that is, we consider the responses of managers to reflect their own attitudes, and do not draw any distinction between managers and workers when creating the attitudes measures.

Financial constraints precluded collection of representative samples of workplaces or employees within cities, and, more generally, restricted sample sizes: approximately 1130 employees participated in 2000 (546 in Taganrog1, 585 in Saratov);[12] 644 employees participated in 2002 (Taganrog2) and 854 employees participated in 2003 (Ekaterinburg). Because the primary focus of our study is on results from the multivariate regression analysis that links earnings and personality, in our descriptive analysis, to promote comparability, we restrict the sample to only those respondents with complete data on attitudes, earnings and relevant other variables; that is those that will be included in the regression analysis. Consequently, our sample includes 357 individuals in Taganrog1, 452 individuals in Saratov, 388 in Taganrog2, and 679 in Ekaterinburg.

Sample characteristics. Table 1 provides summary statistics by location and gender. Roughly speaking, the employees participating in our survey were 35-40 years old, had completed the equivalent of some college education, and had worked at their current place of employment for at least 8 years. About 1-in-5 reported experiencing a period of unemployment. Participating employees who held supervisory positions were likely to be male. The female employees participating in the survey earned about 60% of the reported earnings of the male participants.

[12] Questionnaires were completed by 69 participants in Moscow, but since the sample size for Moscow is too small for independent consideration, we exclude these observations altogether.

Table 1. Descriptive statistics for the key variables by location and gender.

Variable description	Name	Taganrog1		Saratov		Taganrog2		Ekaterinburg	
		Men	Women	Men	Women	Men	Women	Men	Women
Age in years	AGE	36.04 (12.56)	39.44	41.34 (11.81)	40.04 (11.49)	34.99 (9.71)	38.15 (10.46)	39.71 (12.71)	37.78 (11.82)
Tenure in years	HOWLONG	8.62 (11.12)	10.91	10.97 (10.57)	12.46 (11.07)	7.22 (5.95)	11.05 (9.54)	9.24 (9.40)	9.20 (9.26)
Years of schooling	YREDUC	15.16 (2.06)	14.61	15.77 (2.52)	14.69 (2.67)	13.82 (3.40)	13.51 (3.78)	13.97 (2.79)	14.08 (2.46)
Dummy =1 if the respondent has supervisory responsibilities	MGR	0.17	0.09	0.15	0.08	0.41	0.25	0.39	0.23 (0.42)
Dummy =1 if the respondent was unemployed for >2 weeks in last 5 years	UNEMPLY	0.39	0.24	0.20	0.21	0.18	0.18	0.17	0.23 (0.42)
Number of job changes during last 5 years	CHGJOBS	1.06 (1.55)	0.60	0.90 (1.56)	0.59 (1.05)	0.73 (1.04)	0.56 (0.99)	0.79 (1.25)	0.70 (1.11)
Dummy =1 if the respondent works at a state-owned enterprise	DGOVNT	-	-	-	-	0.17	0.45	0.17	0.41
Industry dummies									
Manufacturing	DTYPE1	-	-	-	-	0.61	0.42	0.45	0.29
Retail	DTYPE2	-	-	-	-	0.02	-	0.10	0.17
Other business	DTYPE3	-	-	-	-	0.32	0.23	0.21	0.07
Education	DTYPE4	-	-	-	-	0.01	0.18	0.07	0.15
Other services	DTYPE5	-	-	-	-	0.05	0.16	0.17	0.31
Income per month on the current job (rubles)	YTHISJOB	1516.4 (1377.4)	907.1 (872.5)	1580.9 (1076.8)	1001.3 (772.5)	3474.8 (1716.2)	2333.5 (1124.1)	6721.5 (4155.5)	4151.5 (2263.2)
Women to men earnings ratio		0.60		0.63		0.67		0.62	
Number of observations (N)		137	220	154	298	127	261	174	505

Standard deviations in parentheses.

The means and standard deviations for the variables employed in the regression analysis are presented in Table 1. As seen in the table, age averages vary across samples and by gender. Gender differences also are evident in other variables. Except for Ekaterinburg, women tend to have slightly less years of schooling than men, and on average report longer job tenure, which signals the relatively low mobility among female workers. Evidence on past unemployment experience is mixed. In Taganrog1, women were less likely to have experienced unemployment in the last five years compared to men, but in the other samples there are either no gender differences (Saratov and Taganrog2) or the difference is in favor of men (Ekaterinburg). Not surprisingly, the proportion of managers is much higher among men than among women in all samples. This suggests that men have a priority in receiving managerial positions, even though they do not seem to have a substantial advantage in terms of education and/or work experience with current employer.[13]

The workplace data from Taganrog2 and Ekaterinburg show that manufacturing and other businesses are men's preferred sectors, while employment in education and other services is more common for women. Moreover, the proportion of women working in state-owned enterprises is quite high. More than 40 percent of the women participating in the Taganrog2 and Ekaterinburg surveys were employed by state-owned organizations, while the corresponding number for men is only 17 percent. Finally, as seen in Table 1, the average monthly earnings are everywhere lower for women, and these gender differences are substantial.

3. Personality traits

3.1. Constructing Measures of Personality Traits

We employ two measures of personality traits: (1) locus of control (LOC) – where LOC refers to an individual's personal belief that the events that occur in life are either a result of personal control and effort, or outside forces such as luck (Rotter 1966), and (2) need for challenge or affiliation (C-A) – where need for *challenge* is linked to "getting ahead" and need for *affiliation* is linked to "getting along" (Costa *et al.* 2001, Hill *et al.* 1985, McClelland *et al.* 1976, Twenge 2001).

We use ten questions taken from Rotter (1966) to construct the LOC measure designed to reflect an individual's perception of his or her ability to control own life (see Table 2). Each question asks respondents to indicate their degree of agreement, where degree of agreement is measured on a

[13] Notably, the fraction of persons having supervisory responsibilities is substantially higher in 2002 and 2003 data. This may reflect the differences in sampling procedures by location.

5-point scale, with 1 = "strongly disagree", and 5 = "strongly agree". We construct the *internal* composite measure by adding up the first five items described in the table, while the sum of items 6 through 10 gives us the *external* composite measure. Both measures range in score from 5 to 25 points. To ascertain that the items within the constructed variables reliably measure the same characteristic, we compute Cronbach's alpha (see Table 3) (Cronbach 1951). Our results are comparable to those reported in Mueller and Plug (2004) for personality measures and reveal a substantial correlation of the components within each composite measure. Our LOC measure is defined as a difference between the *internal* and *external* scores, and ranges from negative 20 to positive 20. Thus, the LOC measure shows to what degree the individual is internal; that is, to what extent s/he perceives success to be determined by personal efforts rather than luck.

Table 2. The components of the LOC and challenge-affiliation measures.

Item No	Variable Name	Description
		Internal:
1	NOLUCK	Becoming a success is a matter of hard work; luck has little or nothing to do with it.
2	DESERVE	In the long run, people get the respect they deserve in this world.
3	PLAN	When I make plans, I am almost certain I can make them work.
4	MYSELF	What happens to me is of my own doing.
5	WANTLUCK	In my case, getting what I want has little to do with luck.
		External:
6	GDLEADR	Without the right breaks, one cannot be a good leader.
7	BADLUCK	Many of the unhappy things in people's lives are partly due to bad luck.
8	WHOPROMO	Who gets promoted often depends on who was lucky enough to be in the right place first.
9	ACCIDENT	Most people do not realize the extent to which their lives are controlled by accidental happenings.
10	NOINFLU	Many times I feel I have little influence over the things that happen to me.
		Challenge:
11	PROMO	How important is your chance at getting a promotion or getting a better job?
12	ACCMPL	How important is the chance you have to accomplish something worthwhile?
		Affiliation:
13	RCVRESP	How important is the respect you receive from the people you work with?
14	FRDWKRS	How important is the friendliness of the people you work with?

Table 3. Reliability Coefficient: Cronbach's Alpha

	Taganrog1	Saratov	Taganrog2	Ekaterinburg
Internal	0.56	0.63	0.59	0.65
External	0.70	0.66	0.73	0.71
LOC	0.62	0.65	0.65	0.64
Challenge	0.55	0.64	0.83	0.74
Affiliation	0.73	0.66	0.75	0.77
C-A	0.59	0.60	0.54	0.66

The other personality measure we consider is need for challenge versus need for affiliation. When constructing this measure we use four questions where the respondents were asked to evaluate the degree of importance of the suggested items according to a 5-point scale, with 1 = "not important at all", and 5 = "extremely important". The items are listed in Table 2 and are similar to the ones used by Hill *et al.* (1985). Items 11 and 12 measure the need for achievement, and their sum gives the composite *challenge* measure, which ranges from 2 to 10. Items 13 and 14 evaluate the desire for friendly attitude of co-workers and when added up together give the composite *affiliation* measure, which also ranges from 2 to 10. Our challenge-affiliation (C-A) measure is obtained by taking the difference between *challenge* and *affiliation*, and thus, ranges from negative 8 to positive 8. The reliability measures (Cronbach's alpha) are reported in Table 3. Our reliability measures for *challenge* and *affiliation* are similar to the ones reported by Hill *et al.* (1985), while for the composite C-A measure they are slightly lower.

3.2. Gender Differences in Personality

Are there gender differences in the response patterns among our participants in the two personality traits used in this analysis? Table 4 reports mean responses for the items used in constructing our LOC and C-A composite measures. As seen in Table 4, differences in the mean scores for male and female workers are relatively small for each component of the LOC and C-A composite measures. Albeit small, when combined together, the overall pattern reveals important disparities. First, the mean of the composite *internal* measure is higher for men in all four samples, and this gender difference in response patterns is statistically significant in Taganrog1 and Ekaterinburg. Second, women tend to score higher on the *external* measure: the estimates indicate positive and significant

differences between women's and men's mean *external* scores in three of the four samples (Taganrog1, Taganrog2, Saratov). We find that, among the participating employees in our study, means of the composite LOC measure are everywhere higher for men. The difference is significant at 1 percent level in Taganrog1, Saratov, and Ekaterinburg. This finding implies that in our samples men tend to be more *internal* than women.

	Taganrog1			Saratov			Taganrog2			Ekaterinburg		
	Men	Women	Women-Men	Men	Women	Women-Men	Men	Women	Women-Men	Men	Women	Women-Men
Internal	17.82	15.95	-1.87	16.86	16.83	-0.02	16.86	16.80	-0.06	19.11	17.52	-1.59
	(3.57)	(4.09)	(0.42)	(4.16)	(4.35)	(0.33)	(3.04)	(3.53)	(0.33)	(3.67)	(3.76)	(0.33)
NOLUCK	3.42	3.10		3.41	3.42		3.21	3.28		3.67	3.33	
	(1.19)	(1.33)		(1.34)	(1.42)		(1.01)	(1.17)		(1.17)	(1.22)	
DESERVE	3.66	3.48		3.42	3.56		3.40	3.52		4.06	3.73	
	(1.36)	(1.52)		(1.39)	(1.47)		(1.06)	(1.16)		(1.10)	(1.24)	
PLAN	3.62	3.12		3.44	3.17		3.45	3.36		3.74	3.47	
	(1.06)	(1.28)		(1.14)	(1.30)		(0.92)	(1.13)		(1.06)	(1.16)	
MYSELF	3.60	3.04		3.32	3.17		3.39	3.30		3.91	3.59	
	(1.29)	(1.45)		(1.24)	(1.38)		(0.98)	(1.12)		(1.16)	(1.14)	
WANTLUCK	3.53	3.22		3.27	3.50		3.41	3.35		3.72	3.41	
	(1.11)	(1.29)		(1.23)	(1.35)		(0.96)	(1.14)		(1.07)	(1.18)	
External	15.64	16.50	0.85	15.93	17.72	1.80	16.10	17.05	0.95	16.56	16.34	-0.21
	(4.18)	(4.47)	(0.47)	(4.01)	(4.19)	(0.41)	(3.48)	(3.98)	(0.42)	(4.47)	(3.97)	(0.36)
GDLEADR	3.49	3.50		3.37	3.73		3.55	3.68		3.66	3.54	
	(1.31)	(1.38)		(1.32)	(1.31)		(1.07)	(1.18)		(1.12)	(1.20)	
BADLUCK	2.69	3.03		2.97	3.26		2.99	3.11		3.02	2.97	
	(1.22)	(1.30)		(1.18)	(1.32)		(0.96)	(1.18)		(1.34)	(1.18)	
WHOPROMO	3.42	3.40		3.54	3.73		3.58	3.67		3.60	3.46	
	(1.24)	(1.42)		(1.26)	(1.37)		(1.00)	(1.16)		(1.18)	(1.21)	
ACCIDENT	3.36	3.55		3.33	3.79		3.24	3.48		3.29	3.34	
	(1.26)	(1.23)		(1.17)	(1.14)		(0.99)	(1.11)		(1.21)	(1.16)	
NOINFLU	2.69	3.02		2.71	3.20		2.74	3.11		2.99	3.03	
	(1.21)	(1.29)		(1.19)	(1.38)		(1.02)	(1.14)		(1.30)	(1.20)	
LOC	2.18	-0.54	-2.72	0.93	-0.89	-1.82	0.76	-0.25	-1.00	2.55	1.18	-1.37
	(6.29)	(6.04)	(0.67)	(6.39)	(6.44)	(0.64)	(5.04)	(5.59)	(0.58)	(5.80)	(5.78)	(0.51)
Challenge	8.38	8.50	0.12	8.49	8.72	0.23	8.89	8.28	-0.61	8.09	8.15	0.06
	(1.63)	(1.89)	(0.19)	(1.74)	(1.79)	(0.17)	(1.43)	(2.06)	(0.20)	(1.91)	(1.91)	(0.16)
PROMO	4.11	4.19		4.10	4.32		4.31	3.95		3.82	3.94	
	(1.09)	(1.18)		(1.16)	(1.07)		(0.87)	(1.22)		(1.28)	(1.12)	
ACCMPL	4.27	4.31		4.39	4.40		4.57	4.32		4.26	4.20	
	(0.94)	(1.07)		(0.94)	(0.97)		(0.75)	(0.99)		(0.91)	(1.01)	
Affiliation	8.99	9.45	0.47	9.09	9.45	0.36	8.54	9.17	0.63	8.84	8.97	0.13
	(1.33)	(1.14)	(0.13)	(1.43)	(1.09)	(0.12)	(1.42)	(1.12)	(0.14)	(1.33)	(1.34)	(0.12)
RCVRESP	4.36	4.67		4.47	4.66		4.28	4.55		4.37	4.43	
	(0.82)	(0.70)		(0.82)	(0.70)		(0.84)	(0.71)		(0.78)	(0.77)	
FRDWKRS	4.63	4.78		4.62	4.79		4.27	4.62		4.48	4.54	
	(0.71)	(0.56)		(0.78)	(0.60)		(0.72)	(0.57)		(0.69)	(0.72)	
Challenge-affiliation	-0.61	-0.95	-0.35	-0.60	-0.73	-0.13	0.35	-0.90	-1.24	-0.76	-0.82	-0.06
	(1.75)	(2.06)	(0.21)	(1.86)	(1.96)	(0.19)	(1.84)	(2.32)	(0.23)	(2.20)	(2.01)	(0.17)
N	137	220		154	298		127	262		174	505	

Standard deviations in parentheses.

For the challenge-affiliation measure the picture is somewhat less clear. In Table 4, the mean *challenge* score is significantly higher for men in Taganrog2, while gender differences are insignificant in the other three samples. The means for *affiliation* are everywhere higher for women, with results being significant in Taganrog1, Taganrog2 and Saratov. The average challenge-affiliation scores are slightly larger for men in all samples; however, the gender difference is statistically significant only in Taganrog2.[14] Based on these findings, we conclude that there is only a weak evidence of women having less need for *challenge* compared to men.

Why would men and women differ in their personality traits? Putrevu's (2001) review of the psychological literature offers a number of possible explanations. Many of the explanations involve Social Role Theory (Eagly 1987) which posits that gender differences in personality traits reflect traditional gender roles in society: men are more assertive/aggressive because historically they have been more likely to assume leadership positions or be hunters; women are more likely to be involved in child rearing/domestic work where assertive/aggressive traits are less productive. Research based on self-reported measures document gender differences in personality traits that coincide with the fact that men and women occupy different social roles and are subjected to different social pressures, which tend to generate differences in acquisition of skills and communication techniques, for example (Costa *et al.* 2001, Maccoby and Jacklin 1974, McClelland 1975, Taylor and Hall 1982), contributing to gender stereotypes that are slow to change, despite the changing role of women in society and the workplace (O'Reilly and O'Neill 2003, Twenge 2001). Nolen-Hoeksema *et al.* (1999) discuss the influence of unfavorable environment on shaping personal perception (see Nolen-Hoeksema *et al.* 1999 for related literature). Since women tend to have lower social status and less power than men, they are likely to experience more failures at the early stages of their lives and therefore, may feel they have little control over things. Moreover, a substantial workload at home may produce a feeling of not being appreciated and enhance the formation of external traits in women. All this may explain the gender differences in personality, which we observe.

[14] To make sure that the observed outcomes in Taganrog1 and Saratov data are not driven by the differences in workers' and managers' responses, we repeat the analysis for workers only. The numbers are slightly different from those reported in Tables 5a and 5b, but qualitatively, the results are unchanged.

4. Personality and Earnings

To assess the influence of personality on earnings, we first examine earnings differences by personality trait. To do this we define groups of individuals based on their answers to the locus of control (LOC) and challenge-affiliation (C-A) questions described in Table 2. "Internals" are those for whom the composite *internal* score is larger than the composite *external* score; the opposite is true for "externals." Individuals with an *internal* score equal to the *external* score were assigned to a separate group, called "neither." Similarly, we group workers based on the challenge-affiliation (C-A) measure. That is, an individual is assigned to "challenge" if their *challenge* score is greater than their *affiliation* score, and s/he is assigned to "affiliation" if their *affiliation* score is greater than their *challenge* score. In "neither," the *affiliation* and *challenge* scores are equal.

Table 5. Personality Measures by Location, Percent

	Taganrog1	Saratov	Taganrog2	Ekaterinburg
Internal	52	45	44	54
External	41	45	44	34
Neither	7	10	12	12
Challenge	18	16	29	21
Affiliation	44	42	37	45
Neither	38	42	33	33

Table 5 presents the distribution of our survey participants by personality trait and location. For locus of control, the participating employees are relatively equally split between *internals* and *externals*, with about ten percent scoring equally on the two measures (*neither*). For challenge-affiliation, at least one-third of the participating employees score the same on both the *challenge* and the *affiliation* composite measure (*neither*). About twice as many participants exhibit a need for *affiliation*, in comparison to those who exhibit a need for *challenge*.

Table 6 reports the mean earnings of workers by gender and personality trait: Table 6a focuses on LOC, Table 6b focuses on C-A. The distribution of workers by LOC (Table 6a) shows that in all samples the proportion of "internals" is larger for men, and the proportion of "externals" is larger for women. This is consistent with the results of Section 3 and findings of other studies (e.g. Costa *et al.* 2001) that men tend to be more *internal* than women. Moreover, the data reveal a strong positive correlation between the LOC and earnings for women in both Taganrog1 and Saratov, and

for men in Ekaterinburg. In almost all other sub-samples, individuals with an *internal* LOC have higher wages than individual with an *external* LOC, but the differences are not statistically significant.[15] We interpret this result as evidence in support of the *internal-external* hypothesis: individuals with an *internal* LOC have, on average, higher earnings than do individuals with an *external* LOC.

Table 6a. Earnings and LOC, by location and gender

	Internal	Neither	External	Internal-External
Taganrog1				
Women	1004.4	1290.8	770.3	234.1
	(1029.7)	(1333.2)	(581.3)	(114.8)
N	93	16	111	
Men	1540.1	1178.3	1547.4	-7.2
	(1212.1)	(662.7)	(1689.0)	(240.0)
N	76	10	51	
Saratov				
Women	1147.8	987.1	892.4	255.4
	(981.4)	(802.4)	(532.4)	(95.3)
N	113	38	147	
Men	1669.6	1625.0	1448.7	221.0
	(956.9)	(943.0)	(1251.9)	(187.3)
N	81	14	59	
Taganrog2				
Women	2324.3	2679.4	2253.1	71.2
	(1154.4)	(1073.9)	(1101.1)	(148.3)
N	109	31	121	
Men	3617.9	3642.9	3244.0	373.9
	(2131.1)	(1635.7)	(1137.5)	(336.8)
N	56	21	50	
Ekaterinburg				
Women	4196.2	4409.0	4008.3	187.9
	(2368.6)	(2051.3)	(2177.4)	(221.1)
N	259	59	187	
Men	7389.8	5373.9	5869.6	1520.3
	(4799.3)	(1803.3)	(2975.2)	(764.0)
N	105	23	46	

Standard deviations in parentheses.

[15] The only group where being "internal" is associated with lower earnings is male workers in Taganrog (2000) data, but the difference in mean earnings there is nearly zero and certainly not statistically significant.]

Table 6b. Earnings and C-A, by location and gender

	Challenge	Neither	Affiliation	Challenge-Affiliation
Taganrog1				
Women	1094.1	816.8	919.2	174.9
	(808.2)	(614.4)	(1052.7)	(198.8)
N	34	84	102	
Men	1526.2	1604.1	1446.8	79.5
	(1143.2)	(1459.7)	(1430.8)	(305.8)
N	29	46	62	
Saratov				
Women	991.9	916.9	1095.8	-103.9
	(611.9)	(625.3)	(941.9)	(155.1)
N	42	133	123	
Men	1602.4	1493.8	1646.4	-44.0
	(881.3)	(1026.6)	(1194.7)	(244.4)
N	28	58	68	
Taganrog2				
Women	2562.5	2277.8	2245.4	317.1
	(464.8)	(1346.9)	(1196.0)	(156.2)
N	64	83	114	
Men	3448.3	3461.5	3543.3	-95.1
	(1821.5)	(1622.6)	(1678.8)	(396.3)
N	58	39	30	
Ekaterinburg				
Women	4441.5	4377.5	3871.9	569.6
	(2228.6)	(2417.2)	(2136.6)	(260.1)
N	97	170	238	
Men	6328.2	6639.1	6954.0	-625.8
	(3909.0)	(3201.1)	(4763.7)	(869.2)
N	39	51	84	

Standard deviations in parentheses.

With regard to our C-A measure (see Table 6b), we observe that a large number of respondents have equal *challenge* and *affiliation* scores. Still, among men, the fraction of respondents who report strong preference for *challenge* is greater than among women. The comparison of mean earnings shows that, in Taganrog2 and Ekaterinburg, women with greater need for *challenge* have significantly higher mean earnings than women with revealed need for *affiliation* (see Table 6b). In all other sub-samples, the differences in earnings by c*hallenge-affiliation* are statistically insignificant. Surprisingly, men in Saratov, Taganrog2, and Ekaterinburg tend to earn less if they report a greater need for *challenge*, although the result is not statistically significant. One possible explanation for the observed negative relationship is that men who report preference for *challenge*

are disadvantaged in some other way (for instance, if they have fewer years of schooling or were more likely to have experienced unemployment in recent years). To estimate the net effect of *challenge-affiliation* on earnings we need to control for other factors, and we implement this type of analysis by means of multivariate regression.

4.1. Specification of Earnings Equation

To estimate the effect of personality traits on earnings, we consider a usual semi-logarithmic model for earnings:

$$\ln W = X\beta + u, \qquad (1)$$

where $\ln W$ is the logarithm of monthly earnings, X is a row vector of productivity characteristics, β is a column vector of coefficients and u is the error term. In the vector of observed worker characteristics, X, we include both the LOC and challenge-affiliation measures, where LOC is defined as a difference between *internal* and *external* scores and C-A is defined as a difference between *challenge* and *affiliation* scores. Both measures are standardized; that is, both LOC and C-A scores are measured in standard deviations from their sample means. We hypothesize that individuals with an *internal* LOC and preference for *challenge* receive higher earnings than individuals with an *external* LOC and preference for *affiliation*. So, given the way LOC and C-A are defined, the coefficients on both measures should be positive.

To estimate the effect of personality on earnings, we must hold all other contributing factors constant. Typically, these factors include work experience and measures of skills. Because actual labor market experience is not available in our data, we use age (AGE) and age-squared (AGE2) to proxy for work experience. We expect to find a positive coefficient on AGE – more experienced workers receive higher earnings – and a negative coefficient on AGE2 – the effect of additional experience on earnings diminishes as more experience is acquired. To proxy for skill, we use two variables: years of schooling (YREDUC) is included to capture the effect of formal education, and to control for the firm-specific human capital, we use job tenure (TENURE) and job tenure-squared (TENURE2), where TENURE is measured in years at the current workplace. We expect a positive coefficient on YREDUC and TENURE, and a negative coefficient on TENURE2. We include a dummy variable for managers (DMGR) since earnings are likely to be higher if an individual has supervisory responsibilities. Moreover, whether one holds a supervisory position is likely to be related to LOC and C-A.

Earnings are likely to be influenced by past job interruptions, such as job change (voluntary) or job loss (involuntary). Keith and McWilliams (1995), and others find that if a worker quit his or her job voluntarily, this is usually associated with a search for a better job match, so earnings are likely to be higher after re-employment. On the other hand, if the job separation was involuntary, earnings are likely to fall. To capture both effects, we include the number of times the respondent changed jobs during the last five years (CHGJOB) and a dummy variable equal to one if the respondent was unemployed for more than two weeks during the last five years (UNEMPLY). We hypothesize that long spells of unemployment are usually associated with involuntary job separations, so the effect of past unemployment on earnings should be negative. At the same time, the impact of job change, net of the unemployment effect, should be positive, since job change without intervening unemployment is likely to be voluntary. Most importantly, if either the decision to change jobs or past unemployment experience are correlated with an individual's personality (for instance, if employees with *internal* LOC change jobs more often), then omitting these variables in log-earnings regressions will produce inconsistent estimates for the effects of personality measures on earnings, which might lead us to incorrect conclusions. Therefore, it is important to control for these factors.

We think it is possible that personality may influence the choice of occupation or workplace. For example, jobs that provide more opportunities for demonstrating initiative might be more attractive for individuals with an *internal* LOC and need for *challenge*. Jobs that provide more opportunities for initiative are less likely to be found in manufacturing (relative to services and trade), and more likely to be found in the private sector (relative to the state sector). Given this possibility, and given the data constraints we face, in our regression we control for sector and type of ownership whenever possible. We construct a dummy variable equal to one for state-owned organizations, and we construct a dummy variable for each of the following sectors: manufacturing, retail, other business, education, and other services.

We must also note the reverse causality problem usually discussed in studies on labor market outcomes and personality (Goldsmith *et al.* 2000, Bowles *et al.* 2001). In particular, the relationship between earnings and personality may go in both directions. On the one hand, individual initiative on the job is usually associated with higher productivity and earnings. On the other hand, attitudes and personality traits themselves may be influenced by the size of the reward a worker receives. However, we believe that this issue is unlikely to arise in our situation. Numerous studies find that

personality traits are formed relatively early in life, and although they may change, these changes take time, and are less likely to occur later in life.[16] We measure personality traits and earnings at the same moment in time, and current traits are likely to be determined by past, rather than current, earnings. Therefore, we treat personality traits as predetermined and hence, contemporaneously exogenous in our log earnings equations.

4.2. Regression results

The OLS estimates for the log earnings equations are reported in Tables 7, 8 and 9. For each location, the tables display estimates for the pooled, men's, and women's sub-samples, both with and without personality measures as explanatory variables. Here, we focus our comments on the results by gender and discuss the models with personality measures. The estimates for the pooled samples and specifications without personality are discussed below, when we discuss the earnings gap decomposition. Since information on ownership type and sector is unavailable for Taganrog1 and Saratov, our first specification omits these variables. For Taganrog2 and Ekaterinburg, we are able to include the ownership and sector dummies, and thus present results for this specification in Tables 8 and 9.

As can be seen from the tables, while age has no significant effect on earnings of men and women in Taganrog1, or on earnings of men in Saratov, we do observe the usual concave age-earnings profile in the other sub-samples: the coefficient of AGE is positive, and the coefficient on AGE2 is negative (Table 7). The return to experience with current employer (TENURE) is not significantly different from zero in most samples and sometimes is even negative. This might have happened because workers with longer tenure were likely to be on the same jobs since the early 1990s. During the transition to a market-oriented economy, the reallocation of labor resources leads to higher wages for more productive workers, so employees with greater potential were likely to move to the enterprises in the growing private sector. Correspondingly, those who stayed at their old jobs were either less productive or were equally productive but missed opportunities for earnings advancement. This explanation also fits with the results for our CHGJOBS variable. The coefficient on CHGJOBS is usually positive, although it is rarely statistically significant. However, the effect of

[16] See, for example, Costa and McCrae (1988), Caspi and Roberts (1999), McCrae and Allick (2002) and others who document the fact that there are more similarities in personality traits between individuals aged 30 and 70, than between 20 and 30. Since our analysis focuses on workers and the average age of our respondents exceed 35, we consider that the personality traits are relatively well-established.

past unemployment experience (UNEMPLY) is negative, implying that involuntary job separations were likely to result in lower earnings.

Table 7. OLS estimates for the log of earnings by gender, Taganrog 1 and Saratov

	Taganrog1						Saratov			W
	Whole sample	Women	Men	Whole sample	Women	Men	Whole sample	Women	Men	
AGE	-0.039	0.002	-0.052	-0.029	0.008	-0.046	0.024	0.050	-0.004	
	(0.026)	(0.029)	(0.048)	(0.026)	(0.029)	(0.049)	(0.020)	(0.023)	(0.033)	
AGE2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	-0.001	0.000	
	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	
TENURE	-0.025	-0.057	0.021	-0.027	-0.058	0.019	-0.017	-0.034	0.015	
	(0.016)	(0.020)	(0.028)	(0.016)	(0.020)	(0.029)	(0.012)	(0.014)	(0.021)	
TENURE2	0.001	0.001	0.000	0.001	0.001	0.000	0.000	0.001	0.000	
	(0.000)	(0.001)	(0.001)	(0.000)	(0.001)	(0.001)	(0.000)	(0.000)	(0.001)	
YREDUC	0.088	0.061	0.076	0.089	0.063	0.079	0.049	0.044	0.016	
	(0.018)	(0.019)	(0.034)	(0.017)	(0.019)	(0.034)	(0.011)	(0.013)	(0.020)	
DMGR	0.760	0.712	0.682	0.703	0.681	0.639	0.482	0.569	0.377	
	(0.115)	(0.149)	(0.184)	(0.116)	(0.148)	(0.188)	(0.091)	(0.121)	(0.137)	
UNEMPLY	-0.299	-0.448	-0.211	-0.317	-0.444	-0.231	-0.022	-0.126	0.178	
	(0.105)	(0.124)	(0.179)	(0.104)	(0.123)	(0.180)	(0.084)	(0.095)	(0.142)	
CHGJOBS	0.029	0.008	0.033	0.026	0.007	0.032	0.007	0.027	-0.030	
	(0.037)	(0.056)	(0.055)	(0.037)	(0.055)	(0.056)	(0.029)	(0.042)	(0.042)	
LOC	-	-	-	0.115	0.116	0.071	-	-	-	
				(0.038)	(0.044)	(0.068)				
C-A	-	-	-	0.036	0.045	0.030	-	-	-	
				(0.041)	(0.043)	(0.078)				
Constant	6.455	6.025	6.862	6.209	5.823	6.700	5.688	5.100	6.951	
	(0.505)	(0.534)	(0.971)	(0.506)	(0.534)	(0.986)	(0.422)	(0.478)	(0.710)	
R-squared	0.225	0.233	0.202	0.246	0.259	0.210	0.128	0.170	0.077	
N	357	220	137	357	220	137	452	298	154	

Standard errors in parentheses.

Table 8. OLS estimates for the log of earnings by gender, Taganrog2.

	Whole sample				Women				
AGE	0.033	0.033	0.033	0.034	0.054	0.055	0.044	0.045	0.029
	(0.017)	(0.017)	(0.015)	(0.015)	(0.019)	(0.019)	(0.015)	(0.015)	(0.032)
AGE2	0.000	0.000	0.000	0.000	-0.001	-0.001	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TENURE	0.005	0.008	0.003	0.006	0.004	0.008	0.002	0.004	0.016
	(0.011)	(0.011)	(0.010)	(0.010)	(0.013)	(0.013)	(0.011)	(0.011)	(0.020)
TENURE2	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
YREDUC	0.010	0.009	0.006	0.006	0.015	0.014	0.006	0.007	0.006
	(0.007)	(0.007)	(0.006)	(0.006)	(0.008)	(0.008)	(0.007)	(0.007)	(0.011)
DMGR	0.357	0.337	0.337	0.325	0.232	0.207	0.268	0.242	0.313
	(0.051)	(0.051)	(0.046)	(0.046)	(0.070)	(0.070)	(0.058)	(0.058)	(0.072)
UNEMPLY	-0.256	-0.227	-0.194	-0.183	-0.215	-0.192	-0.142	-0.131	-0.192
	(0.080)	(0.080)	(0.071)	(0.071)	(0.098)	(0.098)	(0.082)	(0.081)	(0.122)
CHGJOBS	0.041	0.044	0.008	0.011	0.036	0.039	0.026	0.027	0.021
	(0.031)	(0.031)	(0.028)	(0.028)	(0.041)	(0.041)	(0.034)	(0.034)	(0.046)
DGOVNT	-	-	0.058	0.063	-	-	0.594	0.584	-
			(0.083)	(0.083)			(0.105)	(0.104)	
DTYPE1	-	-	0.562	0.577	-	-	0.986	0.990	-
			(0.112)	(0.113)			(0.125)	(0.124)	
DTYPE2	-	-	0.446	0.446	-	-	-	-	-
			(0.259)	(0.258)					
DTYPE3	-	-	0.573	0.576	-	-	0.727	0.735	-
			(0.094)	(0.094)			(0.096)	(0.094)	
DTYPE5	-	-	-0.103	-0.091	-	-	-0.197	-0.191	-
			(0.096)	(0.096)			(0.087)	(0.086)	
LOC	-	0.048	-	0.053	-	0.052	-	0.072	-
		(0.025)		(0.022)		(0.030)		(0.025)	
C-A	-	0.029	-	0.011	-	0.024	-	0.013	-
		(0.012)		(0.025)		(0.014)		(0.027)	
Constant	7.041	7.008	6.616	6.562	6.298	6.240	5.715	5.636	7.360
	(0.309)	(0.307)	(0.291)	(0.290)	(0.358)	(0.357)	(0.322)	(0.318)	(0.552)
R-squared	0.181	0.200	0.375	0.385	0.139	0.160	0.421	0.442	0.220
N	388	388	388	388	261	261	261	261	127

Standard errors in parentheses.

Table 9. OLS estimates for the log of earnings by gender, Ekaterinburg.

	Whole sample				Women				
AGE	0.063	0.066	0.057	0.060	0.056	0.058	0.051	0.054	0.089
	(0.015)	(0.015)	(0.014)	(0.014)	(0.019)	(0.019)	(0.018)	(0.018)	(0.025)
AGE2	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001	-0.001
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TENURE	0.001	0.000	0.011	0.011	-0.001	0.003	0.017	0.020	0.004
	(0.010)	(0.010)	(0.010)	(0.010)	(0.013)	(0.013)	(0.012)	(0.012)	(0.017)
TENURE2	0.000	0.000	-0.001	-0.001	0.000	0.000	-0.001	-0.001	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
YREDUC	0.017	0.014	0.033	0.031	0.035	0.030	0.051	0.047	0.025
	(0.010)	(0.010)	(0.010)	(0.010)	(0.012)	(0.012)	(0.012)	(0.012)	(0.016)
DMGR	0.362	0.350	0.295	0.285	0.361	0.347	0.300	0.290	0.219
	(0.055)	(0.055)	(0.052)	(0.053)	(0.071)	(0.070)	(0.067)	(0.067)	(0.089)
UNEMPLY	-0.103	-0.094	-0.078	-0.070	0.116	0.138	0.078	0.093	-0.201
	(0.073)	(0.074)	(0.072)	(0.072)	(0.087)	(0.087)	(0.083)	(0.083)	(0.125)
CHGJOBS	0.060	0.054	0.030	0.024	-0.012	-0.014	-0.027	-0.028	0.087
	(0.026)	(0.026)	(0.024)	(0.024)	(0.034)	(0.033)	(0.032)	(0.032)	(0.040)
DGOV	-	-	-0.293	-0.290	-	-	-0.083	-0.102	-
			(0.068)	(0.069)			(0.078)	(0.078)	
DTYPE1	-	-	0.383	0.390	-	-	0.434	0.408	-
			(0.086)	(0.086)			(0.094)	(0.094)	
DTYPE2	-	-	0.390	0.398	-	-	0.609	0.587	-
			(0.107)	(0.107)			(0.112)	(0.112)	
DTYPE3	-	-	0.402	0.407	-	-	0.415	0.408	-
			(0.100)	(0.100)			(0.132)	(0.131)	
DTYPE5	-	-	0.251	0.262	-	-	0.121	0.129	-
			(0.083)	(0.083)			(0.085)	(0.085)	
LOC	-	0.044	-	0.039	-	0.008	-	0.000	-
		(0.024)		(0.023)		(0.029)		(0.027)	
C-A	-	0.010	-	0.021	-	0.045	-	0.075	-
		(0.012)		(0.024)		(0.015)		(0.029)	
Constant	6.762	6.739	6.423	6.381	6.551	6.565	6.066	6.065	6.353
	(0.314)	(0.314)	(0.311)	(0.313)	(0.374)	(0.371)	(0.368)	(0.366)	(0.539)
R-squared	0.134	0.138	0.237	0.241	0.111	0.128	0.223	0.234	0.189
N	679	679	679	679	505	505	505	505	174

Standard errors in parentheses.

Returns to education (YREDUC) are positive in all specifications. The highest rate of return is observed for Taganrog1 men, where one more year of schooling increases their monthly earnings by approximately 8 percent (Table 7). However, the return to schooling is not significantly different from zero for men in Saratov (Table 7), and men in Ekaterinburg (Table 9), nor is it significant for either men or women in Taganrog2 (Table 8). Having supervisory responsibilities (DMGR) is always associated with higher earnings for both men and women. With the exception of Taganrog2 (Table 8), women enjoy a greater increase in earnings due to holding managerial positions than men. The gain in earnings is particularly large in Taganrog1 (Table 7), where women with supervisory

responsibilities earn approximately twice as much as women without supervisory responsibilities, and the gain is only slightly smaller for men.[17]

Turning to personality measures, we see that the effect of personality on earnings tends to vary by personality trait (LOC versus C-A), and tends to be stronger for women than for men. For example, among Taganrog1 and Saratov participants (Table 7), the coefficient on LOC is positive and highly significant for women, but not for men. If a woman has an LOC score which is one standard deviation larger than the average LOC score in the sample, then her monthly earnings increase by more than 10 percent. This means that, holding other factors fixed, being more *internal* leads to higher earnings for the women participating in the Taganrog1 and Saratov surveys. The story is different for the individuals in Taganrog2 (Table 8) and Ekaterinburg (Table 9). When we do not control for the sector and ownership type, LOC is insignificant for men in Taganrog2, and for both men and women in Ekaterinburg. LOC has a positive effect on earnings of women in Taganrog2, but this effect is only marginally significant and its magnitude is twice smaller than in Taganrog1 or Saratov.

In contrast, challenge-affiliation is statistically insignificant in both Taganrog1 and Saratov (Table 7). However, C-A is important for women in Taganrog2 (Table 8) and Ekaterinburg (Table 9). The coefficient on C-A is positive and marginally significant for women in Taganrog2, and it is positive and highly significant for women in Ekaterinburg. For women in Ekaterinburg, having a challenge-affiliation score which is one standard deviation greater than the sample average leads to an almost five percent increase in earnings; for women in Taganrog2, the increase is slightly greater than two percent. Thus, female participants in Taganrog2 and Ekaterinburg tend to have higher earnings if they demonstrate stronger need for *challenge*. Interestingly, the challenge-affiliation measure has a small negative impact on men's earnings in Taganrog2 and Ekaterinburg, even after we control for other factors. Since the effects are far from being significant, we can conclude that in these samples there is basically no influence of personality on earnings among men.

Including the sector and ownership dummies in the specifications for Taganrog2 (Table 8) and Ekaterinburg (Table 9) causes the magnitudes of the coefficients for both personality measures to change, which means that these personality traits are correlated with workplace characteristics. The presence of such correlation implies that we should include ownership and industry controls in the

[17] Since the coefficients of variable DMGR are quite large, to find the corresponding percentage change in earnings we have to exponentiate the coefficient and subtract unity from the resulting number.

earnings equations if we want to obtain the net effect of personality on earnings. As seen in Table 8, after adding these controls, the LOC coefficient in Taganrog2 sub-sample goes up by almost 40 percent, while the coefficient of the challenge-affiliation measure decreases almost by half. In the Ekaterinburg sub-sample (Table 9), the LOC and C-A coefficients change in the opposite way: the effect of LOC drops to zero, and the coefficient on C-A rises by nearly 70 percent. Both personality traits are still insignificant for men. Importantly, we can conclude that, even after controlling for the industry and ownership type, the personality measures have a significant positive effect on women's wages.

Discussion of results. We find that men and women participating in the surveys differ in their personality traits: men, on average, are more *internal* and exhibit more need for *challenge* than women. Both the descriptive and regression analyses of earnings show that individuals with an *internal* LOC and preference for *challenge* are those with higher earnings, although this result is statistically significant for only some groups of workers. Moreover, the average monthly earnings of women are substantially lower than those of men; the ratio of the average women's earnings to average men's earnings ranges from 0.6 to 0.67, depending on location (see Table 1).[18] Moreover, given the relationship between personality and earnings documented above and elsewhere in the literature, we should expect our results to differ when including personality traits in the specification. The earnings difference is driven in part by the fact that women are less likely than men to exhibit an *internal* LOC and less likely than men to demonstrate a need for *challenge*. To find out what part of the gender earnings gap is due to gender differences in personality, we apply the Oaxaca-Blinder-Neumark decomposition technique as described in the next section.

5. Gender Earnings Gap Decomposition

5.1. Methodology

To calculate how much of an impact gender differences in personality have on gender differences in earnings, we base our estimation strategy on the decomposition method proposed by

[18] Our results are slightly lower than results reported in studies using RLMS data. Ogloblin (1999), for example, reports the ratio of 0.67 for 1994-1996; Newell and Reilly's (2001) estimate is 0.695 using 1996 RLMS data. This discrepancy may be either due to specific economic conditions in the locations covered by our data or due to general economic trends in Russia's transition economy. Ogloblin (1999) argues that the gender earnings gap is usually larger in market economies compared to the centrally-planned economies. Therefore, we expect the earnings ratio in Russia to increase over time, as transition progresses.

Oaxaca (1973) and Blinder (1973). Specifically, the gender earnings differential is defined as a difference in the average log earnings of men and women:

$$\overline{\ln W_m} - \overline{\ln W_w} = \overline{X}_m \beta_m - \overline{X}_w \beta_w \qquad (2)$$

Here $\overline{\ln W}$ is the average natural logarithm of monthly earnings, $\overline{X}$ is a vector of average worker characteristics that affect productivity, and subscripts *m* and *w* are for men and women, respectively. The vector of coefficients β_m is obtained from the ordinary least squares (OLS) regression of men's log earnings ($\ln W_m$) on their observed characteristics (X_m), and β_w is a similar set of coefficients for women. As suggested by Oaxaca (1973) and Blinder (1973), the differential can be decomposed as

$$\overline{\ln W_m} - \overline{\ln W_w} = \left(\overline{X}_m - \overline{X}_w\right)\beta_m + \overline{X}_w\left(\beta_m - \beta_w\right), \qquad (3)$$

or

$$\overline{\ln W_m} - \overline{\ln W_w} = \left(\overline{X}_m - \overline{X}_w\right)\beta_w + \overline{X}_m\left(\beta_m - \beta_w\right). \qquad (4)$$

In both equations (3) and (4), the first term on the right-hand side represents the explained difference in earnings, or the earnings gap due to differences in the observed characteristics of workers, such as education, work experience, and personality. The second term represents the unexplained part of the earnings differential. Since the nature of this remaining differential is not known, it is usually attributed to gender discrimination. The important difference between equations (3) and (4) comes from the underlying assumptions used in these models. Equation (3) assumes that the "correct" or "nondiscriminatory" vector of coefficients, which would prevail in the absence of discrimination, is the vector of coefficients from the OLS regression for men. On the other hand, in equation (4), coefficients from women's regression define the nondiscriminatory wage structure.

Since neither of the two extremes seems to be plausible, several studies proposed extensions to the Oaxaca-Blinder decomposition. In these alternative approaches, the nondiscriminatory wage structure is represented by the coefficients lying somewhere in between β_m and β_w. Reimers (1983) uses the coefficients, which are the weighted sum of β_m and β_w with the weight equal to one-half. Cotton (1988) suggests choosing the weights equal to the share of the corresponding group in the population. Another approach is discussed in Neumark (1988) and Oaxaca and Ransom (1994), who

show that the coefficients describing nondiscriminatory wage structure can be estimated by the OLS log earnings regression on the pooled sample of men and women.

Incorporating the extensions described above, the decomposition equation can be written as

$$\overline{\ln W_m} - \overline{\ln W_w} = \left(\overline{X}_m - \overline{X}_w\right)\beta + \overline{X}_m\left(\beta_m - \beta\right) + \overline{X}_w\left(\beta - \beta_w\right). \qquad (5)$$

In this specification, β are the coefficients in the nondiscriminatory setting, and the first term on the right-hand side is the explained part of the earnings gap. The last two terms on the right-hand side measure the difference in earnings due to discrimination: the second term interpreted as men's advantage, and the third term interpreted as women's disadvantage.

In this study we employ the wage gap decomposition described by equation (5), and we choose β being the coefficients from the log earnings equation for the pooled sample, as in Neumark (1988) and Oaxaca and Ransom (1994). This approach is least restrictive because it does not require that β be determined from the coefficients in men's and women's equations. Moreover, since our main interest lies in studying the composition of the explained part of earnings differential, we will not spend much time discussing the discriminatory component of the earnings gap. Our main question is whether gender differences in personality explain a significant part of the earnings differential.

We note that men are under-represented in our data in all samples. As seen in Table 1, women constitute about 62 percent of Taganrog1 participants, 66 percent of Saratov participants, 67 percent of Taganrog2, and 74 percent of Ekaterinburg. In contrast, according to Rosstat, in early 2000's, women account for only about 48 percent of working population (Rosstat, 2002). Since this difference is important in estimating the nondiscriminatory wage structure, we use analytical weights in the pooled regressions to correct for the discrepancies between the samples and population characteristics.

5.2. Earnings Gap Decomposition Results

The results of the gender earnings gap decomposition are reported in Table 10. The data reveal several reasons for the observed gender differences in pay. Women's earnings are generally lower because of unfavorable age structure and often because they have too many years of experience with current employer. In Ekaterinburg, the average years of tenure is slightly lower for women than for men, so in this sample women gain an advantage due to this factor, although the gain is very small. In both Taganrog1 and Saratov, as well as in Taganrog2, women's earnings are lower than those of men because here women on average have fewer years of schooling. In all samples the loss in women's earnings due to the lower probability of having supervisory responsibilities is quite large. In Taganrog1 we observe a noticeable narrowing of the gender earnings gap because of fewer cases of past unemployment experience among women. The opposite is true for Ekaterinburg, where the incidence of unemployment was more common for women than for men. Moreover, women suffer a small disadvantage due to the relatively low average number of job changes, and a substantial loss in earnings because of the unfavorable characteristics of their work places.

Table10. Decomposition of the gender earnings differential by location.

	Taganrog1		Saratov		Taganrog2				
	No ownership & industry controls		No ownership & industry controls		No ownership & industry controls		With ownership & industry controls		No own industry
	Model with attitudes	Model without attitudes	Model with attitudes	Model without attitudes	Model with attitudes	Model without attitudes	Model with attitudes	Model without attitudes	Model with attitudes
Gross differential	0.466	0.466	0.483	0.483	0.422	0.422	0.422	0.422	0.485
Differences in characteristics:									
Age	0.051	0.036	0.006	0.007	0.006	0.001	-0.004	-0.006	0.005
Tenure	0.046	0.049	0.012	0.012	0.010	0.001	0.014	0.009	-0.001
Years of schooling	0.049	0.049	0.053	0.051	0.003	0.003	0.002	0.002	-0.002
Manager	0.062	0.057	0.032	0.030	0.056	0.053	0.053	0.051	0.057
Unemployment experience	-0.045	-0.047	0.000	0.000	0.001	0.001	0.001	0.001	0.006
Job changes	0.013	0.012	0.002	0.000	0.007	0.008	0.001	0.002	0.006
State-owned enterprise	-	-	-	-	-	-	-0.016	-0.018	-
Industry:									
Manufacturing	-	-	-	-	-	-	0.106	0.109	-
Retail	-	-	-	-	-	-	0.007	0.007	-
Other business	-	-	-	-	-	-	0.051	0.051	-
Other services	-	-	-	-	-	-	0.012	0.011	-
LOC	-	0.050	-	0.031	-	0.009	-	0.010	-
Challenge-Affiliation	-	0.006	-	0.001	-	0.035	-	0.006	-
Total explained differential	0.176	0.212	0.105	0.133	0.084	0.110	0.227	0.235	0.071
Unexplained differential	0.290	0.254	0.387	0.350	0.338	0.312	0.195	0.187	0.414

Returning to one of the main questions of this study, do differences in personality explain the differences in pay by gender, we can see from Table 10 that, indeed, differences in attitudes explain part of the earnings differential. Specifically, since women on average are less likely to be *internal*, their earnings are lower than earnings of men. The gender differences in desire for *challenge* have a similar effect. Women on average have greater need for *affiliation* and less need for *challenge* compared to men, and since the preference for *challenge* is rewarded in the labor market, men tend to have higher earnings than women.

The part of the differential explained by the differences in personality varies by sample. However, in all four samples, the addition of the personality measures in the specification leads to a notable reduction in the unexplained part of the gender earnings differential, especially in Taganrog1 and Saratov. If we consider decomposition based on the regressions without ownership and sector controls, we can see that, after incorporating the personality measures in earnings equations, the unexplained component decreases by 12 percent in Taganrog1, 10 percent in Saratov, 8 percent in Taganrog2, and 2 percent in Ekaterinburg. In the extended models with ownership and sector controls, the reduction in the unexplained component is about 4 percent in Taganrog2, and 3 percent in Ekaterinburg.

Importantly, even when controlling for all available productivity factors, these factors explain only a limited part of the observed earnings differential. Differences in worker characteristics account for 45 percent of the gap in Taganrog1, 28 percent of the gap in Saratov, 56 percent of the gap in Taganrog2, and 38 percent of the gap in Ekaterinburg (in the last two samples the models with ownership and sector controls were considered). Thus, a substantial part of the gap remains

unexplained, suggesting that there are other factors, including discrimination, which are also important for determining the differences in pay for men and women.

6. Concluding Remarks

Our findings regarding gender differences in personality traits match those routinely reported: among the participants in our survey, men tended to exhibit an *internal* locus of control and need for *challenge*, while women tended to exhibit an *external* locus of control and need for *affiliation*. In terms of the impact on earnings, neither locus of control nor challenge-affiliation influenced the earnings of the male workers participating in our survey. Earnings of the female participants were influenced by personality traits, however. Women who exhibited an *internal* locus of control tended to earn more, as did women who exhibited a need for *challenge*. Including these two personality traits in our wage regressions reduced the unexplained portion of the gender wage gap by as much as 12 percent.

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