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**Personality as Predictor of Occupational Choice:
Empirical Evidence from Germany**

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Abstract

This paper investigates the influence of personality traits on occupational choice using data of the German Socio-Economic Panel. We conduct multinomial logit analyses to differentiate male managers, professionals, technicians, clerks, service workers, and manual workers with respect to their personality as measured by the Big Five. The data provide extensive information on the socioeconomic background of individuals as well as characteristics of the workplace which are included as controls. The findings indicate that manual workers are less extraverted, more conscientious as well as less agreeable and open than employees from most other occupational groups. Practical implications of the results are discussed.

Keywords: Five Factor Model, Personality Traits, Occupational Choice

1. Introduction

Labor markets are highly heterogeneous, given the great variety of jobs and occupations. This may be due to the demand or supply side of these special markets. First, employers offer different kinds of jobs which require different skills. Second, individuals select jobs according to their personal preferences. The usual explanation for this variety offered by human capital theory is that individuals differ according to education and experience. Boskin (1974) and Schmidt & Strauss (1975) were among the first to present empirical evidence using discrete choice econometric models. They show that individuals sort into jobs which satisfy their particular utility functions (see also Heckman & Honore 1990). Individuals will choose those jobs where their specific characteristics, such as education or experience, can be productively used. Yet individuals do not only differ in education or experience but also in their personality traits. Only recently, Borghans et al. (2008) have emphasized the linkage between personality traits and economic preferences such as risk aversion, time preferences, and economic outcomes. Previously, individual characteristics usually have been treated as a “dark matter” in economics (Heckman & Rubinstein 2001). Heckman et al. (2006) show that the predictive power of personality traits for occupational choice and wages even exceeds the predictive power of cognitive traits.

While employers use information about education and experience to decide which applicant to employ, personality tests can be viable instruments to further enhance the knowledge about attitudes, work behavior, and outcomes in the organizational setting (Ones et al. 2007). Therefore, it is an important question whether and, if so, what information personality traits can offer that is not contained in human capital. On the other hand, this information is also valuable for vocational counselors whose aim is the perfect fit of individuals and jobs. If they know which personality traits are required, for example for managers, and which are necessary for a successful career as a professional, they can provide helpful advice based on the personality of the respective person.

A huge body of literature exists in psychology, investigating the link between occupational behavior such as occupational choice, and personality (see, among others, Tokar et al. 1998; Larson et al. 2001; Barrick et al. 2003; Sullivan & Hansen 2004, and Mount et al. 2005). These studies share the idea that individuals are more satisfied and perform better when they are in occupations that match their interests (Lee et al. 2000; Durr II & Tracey 2009). However, many studies are based on small and non-representative samples.

In this paper we study the effects of personality traits (as measured by the Big Five) on occupational choice. Based on data from the German Socio-Economic Panel (GSOEP), we analyze if extraversion,

neuroticism, conscientiousness, agreeableness, and openness have an influence on whether a person is employed as a manager, professional, technician, clerk, service worker, or manual worker. To our knowledge, we are the first to investigate this topic using a large and representative German data set. The GSOEP is well suited for this research question as it offers a comprehensive database with much information that can be included as controls. This enables us to analyze if personality traits have a significant impact on occupational choice while controlling for other variables which are used in a human capital approach (see Mincer 1970; Polachek 1981). As human capital variables have a substantial impact on the choice of occupation, we rather concentrate on investigating whether personality traits offer additional information about the question of occupational choice. However, we are not able to disentangle the impact of self-selection of the individual from the selection by the employer on the chosen occupation (see Rosen 1976).

Regarding personality traits, we find significant differences between manual workers and other occupational groups. Manual workers are less extraverted and more conscientious than most other occupational groups. In contrast to managers, professionals, and technicians, manual workers are less open. Our results also indicate that there are significant differences in the level of agreeableness between manual workers and technicians.

The remainder of the paper is organized as follows. In the next section, we discuss the relationship between personality traits and occupational choice. In section 3 we describe the data and methods we have applied and derive our hypotheses. The results are presented and discussed in section 4 while section 5 deals with the robustness of our findings. We conclude in section 6.

2. Personality and Occupational Choice

Among psychologists, the question determining the decision for a certain occupation has been of interest for a long time. In 1956, Blau et al. introduced a conceptual framework which contained psychological, economic, and sociological factors to explain occupational choice. Holland (1958, 1985) argued that personality traits have an impact on vocational choice and proposed a model containing six personality and work environment types, known as Holland types or RIASEC. These types are frequently used in vocational counseling to achieve the optimal match between employer and employee. Correspondingly, studies examining the person-vocational fit report more job satisfaction if the job matches the personality traits of the employee (see Spokane 1985 and Assouline & Meir 1987).

According to Holland (1997), six types exist: realistic, investigative, artistic, social, enterprising, and conventional. Realistic types like working with their hands, with tools, or machineries. They work in

agriculture or mechanical engineering, for example. In contrast, investigative types enjoy working methodically, analytically, and processing information. Examples of where this type fits are economics, mathematics, and science in general. Artistic types cannot only be found among actors and artists but also in professions such as graphic design or art therapy. Typically, they are creative, non-conformative and independent. Social types are described as supporting, helpful, and enjoying working in social contexts such as nursing, counseling, or the medical professions. Enterprising types like to persuade, lead, and dominate others and can be found in management positions, banks, and insurances. Finally, conventional types pay much attention to detail and enjoy organizing tasks and work, for instance, as accountants, actuaries, or technical writers (Astin & Holland 1961).

The RIASEC model works for different cultures and ages (see, e.g., Day & Rounds 1998), and it is easy to see that this typology allows vocational counselors to identify occupations which fit the personality traits of their clients.

Within the last two decades, there has been a growing body of research investigating the overlap between RIASEC and the Big Five (see, e.g., Tokar 1998, Barrick et al. 2003, or Armstrong & Anthony 2009). The Big Five taxonomy has evolved as a consensus from personality psychology and enables scientists to compare the results from personality research (see John & Srivastava 1999 and McAdams 2006 for comprehensive overviews of the Big Five concept). The Big Five (extraversion, neuroticism, conscientiousness, agreeableness, and openness) are found to predict job performance (see, e.g., Barrick & Mount 1991, Barrick et al. 2001, Salgado 1997, Tett et al. 1991), counterproductive behavior (see Salgado 2002), and career success (see Seibert & Kraimer 2001), which is why an individual's ex ante decision for an occupation is an essential research question.

Five out of 30 possible correlations of the five personality dimensions with the six Holland types are of substantial importance for both men and women. These are (i) artistic and openness, (ii) enterprising and extraversion, (iii) social and extraversion, (iv) investigative and openness, and (v) social and agreeableness. The meta-studies of Larson et al. (2002) and Barrick et al. (2003) summarize the fairly consistent results of this literature. These studies state that both concepts are related but not completely substitutable. Based on these findings, one can conclude that individuals rather engage in activities that are congruent with their character; e.g., more agreeable individuals engage in social activities while more open individuals tend to engage in investigative or artistic activities (see Barrick et al. 2003). Furthermore, Tokar (1998) and Moutafi et al. (2007) show that individuals with a high level of extraversion tend to work in management or entrepreneurial positions. In contrast, conscientiousness and neuroticism were found to consistently influence job

performance in that more conscientious and emotionally stable employees perform better overall - not necessarily because of the job content or the employees' interests, but because of the general tendencies to persist with chosen tasks and goal-setting attitudes (see Judge & Ilies 2002). In general, personality traits seem to offer a valuable instrument to investigate occupational choice and job performance (see Filer 1986).

In contrast, economists have tried to explain the choice of occupation by referring to human capital theory (see, e.g., Boskin 1974 and Polachek 1981). As Becker (1993) has claimed, education, experience, and other skills can be regarded as human capital which, like any other factor, is needed for production. Therefore, one would expect employees with a higher level of human capital to sort into jobs where this is most productive and most valued by employers (see Gould 2002). Neal (1995) provides evidence that displaced workers face larger wage reductions if they switch industries, compared to finding a new job within the same industry. Their skills seem to be industry specific rather than firm specific. For this reason, human capital is usually measured in terms of education and duration of overall job experience instead of job specificity (see Shaw 1984). As the study of Paglin & Rufolo (1990) shows, mathematical abilities of college students can help to explain differences in earnings and occupational choice.

Another factor which has been investigated is parental influence. Following the so-called "dynasty hypothesis," this increases the likelihood that children select the same or a similar occupation as their parents. There are various explanations for this effect, ranging from human capital transfer between parents and their offspring (Laband & Lentz 1983) to aspects of religion (Fan 2008). For example, Tsukahara (2007), Constant and Zimmermann (2003), and Ham et al. (2009a/b) included parental information (e.g., parent's occupation, parent's education, parent's social status) in their analyses of occupational choice. Tsukahara finds an effect of fathers on sons in Japan; the other two studies report only limited evidence.

While most of the studies mentioned either focus on personality *or* on human capital variables and use non-representative data sets, we analyze the impact of personality traits on occupational choice using a large and representative data set. This enables us to control for human capital and other factors which also affect occupational choice. Related studies are those by Ham et al. (2009a/b), who use a large Australian data set. They show that besides variables of human capital like education, personality also has a significant effect on the choice of occupation. In their first study (2009a), they only distinguish between blue- and white-collar workers and find higher levels of conscientiousness to be associated with an increased probability of a worker being a white-collar worker. In their

follow-up analysis (2009b), they split their data set into eight occupations such as managers, technicians, or sales workers among others. Again, they report a significant impact of personality traits on occupation. Similar to Ham et al. (2009b), we distinguish between several different occupations and employ the concept of the Big Five as a measure of personality. In contrast, we focus on the differences between manual workers and the other reported groups. The distinction of occupations is based on a categorization called *International Standard Classification of Occupations* (ISCO 88). This classification is used in the European Union to organize occupations in a hierarchical framework. Based on the required levels of skills to execute tasks, ISCO 88 aggregates occupations into broadly similar categories, distinguishing four levels ranging from primary education (first level) to university or postgraduate degree (fourth level). Furthermore, ISCO 88 implements four levels of aggregation. The first is the most aggregated and consists of ten major groups. The second consists of 28 sub-major groups, followed by 166 minor groups and 390 unit groups. Hence, the classification can be either broad or disaggregated. For our purposes, the major groups provide a good level of aggregation. For a more detailed description of all groups and the development of ISCO 88, please refer to Elias and Birch (1994). However, as we are not primarily interested in the required skill levels but in the character of the occupations, we further aggregate some of the groups in our analysis. The details of this process are described at the beginning of next section. The first of our major groups is comprised of “legislators, senior officials, and managers” and includes managers such as corporate managers or managers of small enterprises. The second group is comprised of “professionals” and includes occupations which require a considerable amount of professional knowledge and experience. For example, teaching professionals must teach in one or more disciplines at different educational levels, execute research, and improve concepts of their respective discipline. In contrast, “technicians and associate professionals” execute mostly technical or related tasks and apply scientific concepts and theories.

3. Data, Methods, and Hypotheses

Data

We use data from the 2005 wave of the German Socio Economic Panel (GSOEP).¹ Within the GSOEP a representative sample of the German population has been surveyed annually since 1984. The longitudinal data set provides a wide range of information on the living and working conditions of individuals and their respective households, including information on their socio-economic

¹ The original data used in this paper was extracted using the Add-On package PanelWhiz for Stata[®]. PanelWhiz (<http://www.PanelWhiz.eu>) was written by Dr. John P. Haisken-DeNew. See Haisken-DeNew and Hahn (2006) for details. The PanelWhiz generated do-File to retrieve the data used here is available from the corresponding author upon request. Any data or computational errors in this paper are our own.

background as well as on working conditions and employer characteristics along with measures of personality and attitudes. For the documentation of the data set, see Haisken-DeNew & Frick (2005).

The 2005 wave includes a 15 item scale (BFI-S) to measure the Big Five personality dimensions, which has been conceptualized and validated for the use in the extensive GSOEP survey (Dehne & Schupp 2007). Each personality dimension is assessed by three items each, which are merged to an average score of the respective Big Five dimensions. See table A1 in the appendix for details. In our statistical analysis, all personality measures are included as standardized z-scores.

Information on the occupations of respondents is available from a generated variable in the GSOEP data containing the International Standard Classification of Occupations (ISCO 88), which we use for the creation of our occupational group variable comprising occupational groups at a major level. We exclude employees working in the “armed forces” as the number of observations is relatively small. The occupational group of “elementary occupations” is also excluded as we expect relatively low skill levels to be the reason for employees being assigned to this group rather than their personality or personal interests, presumably precluding them from choosing other occupations which require higher skill levels, e.g., being able to cope with more complex tasks.

We aggregate employees from the groups “skilled agricultural and fishery workers,” “craft and related trades workers,” and “stationary plant and machine operators and assemblers” into one group, i.e., “manual workers,” as these groups share the characteristic of manual work. Arguably, the occupations of the previous three groups are rather heterogeneous. We believe, though, that the characteristic of manual work differentiates this group from the other occupational groups as the preference to work manually can be the result of different underlying personality characteristics. Accordingly, employees are assigned to one of the following groups: (1) managers, (2) professionals, (3) technicians, (4) clerks, (5) service workers, and (6) manual workers.

Occupational group information is surveyed annually in the GSOEP, which enables us to calculate the modal occupational group for each employee. We exclude all employees whose occupational group in 2005 differs from their modal occupational group (9% of the original employee sample). As we stick to cross-sectional analysis, a possible bias could evolve by including those observations as the process of occupational choice might not have been completed for those employees.

We further restrict our sample to male employees to avoid possible bias from two other sources: first, there appear to be gender-related differences in personality (see Costa et al. 2001), which are also apparent in our data from t-tests (not reported) and, secondly, women are likely to be less

independent with respect to occupational choice as they traditionally take on stronger responsibilities, e.g. children and household. This is supported by Cobb-Clark & Tan (2009), who report that men and women with similar non-cognitive skills choose their occupations differently.

Although the original ISCO classification distinguishes various skill levels, the categories at the major level are likely to comprise rather different jobs with respect to complexity and demands, which is why we account for more differentiated human capital effects by including controls for educational background (measured in years of education), experience (measured by age and age squared), and wage as an indicator of the character of the job.

Individuals who were unemployed at the time of gathering the personality information are excluded from the sample as they were found to differ significantly on all personality scales for employed individuals according to t-tests (not reported).

The sample selection results in 4,877 male employees from Germany with a share of 8.4% managers, 23.8% professionals, 16.7% technicians, 5.8% clerks, 4.7% service workers, and 40.6% manual workers.

As additional variables of the socio-economic background of the individuals, we include dummy variables assessing marital status, existence of children, ethnic background, and regional background in Germany. Since the 2005 GSOEP data does not provide an adequate measure of parental status for the remaining observations, we do not include such controls. However, we are confident that our results are still viable, given the results of current studies indicating that intergenerational effects only have a limited influence on occupational choice (e.g., Constant & Zimmermann 2003; Ham et al. 2009b). Even though there is evidence for Germany suggesting that occupational decisions are made early in life (Constant & Zimmermann 2003), workplace and employer characteristics might also influence occupational choice. For this reason, we include controls for firm size and industry sector. For a list and definition of all variables, see table A2 in the appendix.

Methods

Following the descriptive analysis of the data, a multinomial logit model is estimated to investigate the influence of personality on occupational choice (Cameron & Trivedi 2009; Constant & Zimmermann 2003; Cheng & Long 2003). We apply a multinomial logit regression because our dependent variable (*occupation*) is a nominal variable with six different outcomes. As we cannot entirely rank those outcomes, we cannot use an ordered probit model. The multinomial logit model specifies the probability of observing occupational group m (with $m = (1)$ managers, (2) professionals,

(3) technicians, (4) clerks, (5) service workers, and (6) manual workers) for a given set of independent variables (including a constant term) x as

$$\Pr(y = j | x) = \frac{\exp(\beta_j x_i)}{\sum_{k=1}^J \exp(\beta_k x_i)} \quad \text{for } j=1, \dots, J; j \neq k \quad (1)$$

Equation (1) ensures that the probability of observing any occupational group is between 0 and 1 and the probabilities of observing every single occupational group add up to 1. To identify the model the coefficients of one of the occupational groups, (β_j) are set to zero, which allows interpreting the coefficients of the other β_j with respect to that base group. The easy estimation and straightforward interpretation of the model is Janus-faced as unbiased estimates rely on the critical assumption of the independence of irrelevant alternatives, i.e., an individual's choice between two alternative outcomes is unaffected by other available choices - everything else being equal (Cheng & Long 2007). We chose manual workers as base group because it is the largest occupational group in our sample, and we expect this group to differ significantly stronger from the other occupational groups. Nevertheless, we test for the independence of irrelevant alternatives by applying a test by Hausman and McFadden (1984) (not reported), which indicates that the occupational groups in the chosen model are satisfactorily independent of each other. Additionally, we subjected our results to several robustness checks, including binary estimation models.

Three specifications are estimated: model (1) only includes the respective measures of personality, model (2) includes additional controls for the socio-economic background of the individuals, and model (3) includes extra variables on workplace and employer characteristics.

Hypotheses

Based on the literature described above, we derive the following hypotheses.

As the group of manual workers is characterized by working with their hands, we assume that they do not have to engage in social interactions as often as, for example, managers or service workers. As higher levels of extraversion are needed in occupations involving social interaction or the communicating and reaching of decisions, we especially expect managers to possess higher levels of extraversion. This expectation relies on the findings of Moutafi et al. (2007) and Ham et al. (2009b), who both report higher levels of extraversion to be related to managerial positions.

Hypothesis 1 (extraversion): Manual workers report lower levels of extraversion than other occupational groups.

The skills of manual workers belong to the second level because the latter have usually completed the first and/or second stage of secondary education. Mostly, they execute relatively straightforward tasks and receive clear-cut orders concerning their work flow. In contrast, managers, for example, deal with higher levels of uncertainty regarding their work flow. We expect the level of emotional stability needed in occupations to rise with uncertainty regarding the work flow and the complexity of the tasks to be executed. Hence, manual workers are likely to report higher levels of neuroticism than other occupational groups. Regarding managers, Moutafi et al. (2007) and Ham et al (2009b) report neuroticism to be negatively correlated with managerial positions.

Hypothesis 2 (neuroticism): Manual workers report higher levels of neuroticism than other occupational groups.

Conscientiousness is associated with responsibility as well as efficient and planful work. This trait is essential for the work of managers and clerks while manual workers often execute well-defined tasks which do not require such high levels of planning or self-control. Conscientiousness is also a valid predictor of leadership ratings (Borghans et al. 2008). Ham et al. (2009b) report that, in Australia, it raises individuals' prospects of working as a manager or clerk.

Hypothesis 3 (conscientiousness): Manual workers report lower levels of conscientiousness than other occupational groups.

Individuals with high levels of agreeableness are prosocial and concerned with pleasing others, which is helpful in service and social occupations. We therefore expect individuals working in service or as clerks to be more agreeable than manual workers who typically engage in less in social interaction. On the other hand, we do not expect to find differences in the agreeableness of manual workers and managers as the latter need authority to be successful. Ham et al. (2009b) claim that managers are less agreeable than individuals in other occupations.

Hypothesis 4 (agreeableness): Manual workers report lower levels of agreeableness than service workers or clerks.

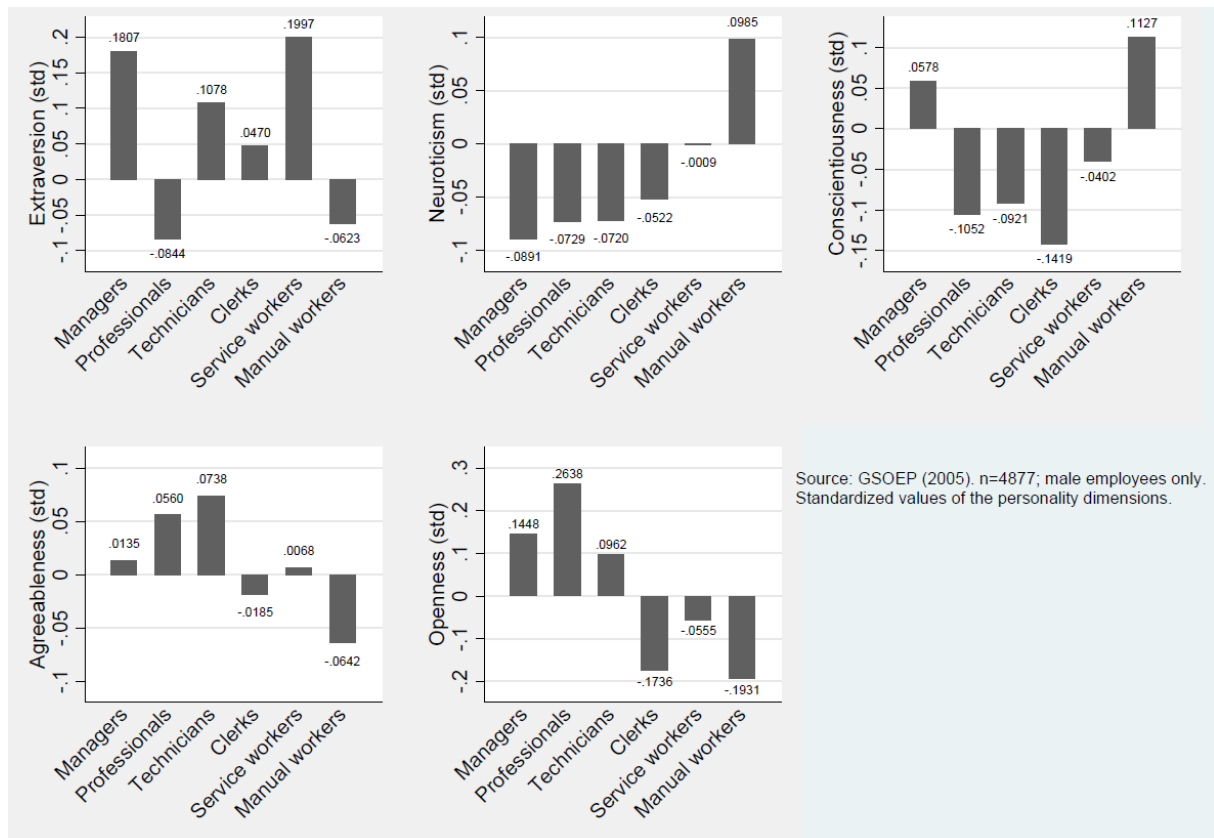
Individuals with a high level of openness prefer jobs characterized by change and variety rather than jobs involving routine tasks. In general, managers, professionals, and technicians have to be open to new experiences and adapt fast to new technologies. The results of Ham et al. (2009b) suggest that managers and professionals possess higher levels of openness than laborers or operators.

Hypothesis 5 (openness): Manual workers report lower levels of openness than managers.

4. Results and Discussion

Figure 1 contains bar charts of the standardized values of the Big Five personality dimensions for our six occupational groups. At first sight, we observe that manual workers indeed differ from the other occupational groups in most personality dimensions. They report relatively low, or even the lowest, levels of extraversion, agreeableness, and openness compared to the other occupational groups, while they score highest in neuroticism and conscientiousness. This is in line with four of our hypotheses.

Figure 1: Big Five scores by occupational group



A closer look at the descriptive statistics by taking mean comparison tests into account (see table 1), reveals that manual workers are significantly less introverted than managers, technicians, and service workers but seem to exhibit similar levels of extraversion as professionals. With respect to neuroticism, we observe that manual workers score highest on this scale. This is significant, at least at the 5% level, compared to the other occupational groups except for service workers. For conscientiousness, we observe the reverse of the expected effect, although it is not statistically significant with respect to the group of managers. In contrast, manual workers exhibit lower levels of agreeableness than the other occupational groups. Nevertheless, this is only highly significant for the groups of professionals and technicians. With the exception of clerks, we also observe that manual

workers are significantly less open than other employees. Yet these results may also be driven by other variables such as education and experience as measures of human capital.

Table 1: t-tests: Big Five dimensions by occupational group

OCCUPATIONAL GROUP	BIG FIVE				
	Extraversion	Neuroticism	Conscientiousness	Agreeableness	Openness
Manual workers (n=1978)	reference group				
Managers (n=410)	***	***	/	/	***
Professionals (n=1161)	/	***	***	***	***
Technicians (n=814)	***	***	***	***	***
Clerks (n=238)	*	**	***	/	/
Service workers (n=231)	***	/	**	/	*

Notes: n=4877; only male employees; ***(**, *, /): t-test significant at 1%, 5%, 10% level, means are not significantly different from each other; manual workers are the reference group.

When inspecting the main results of the multinomial logit regression, we find personality to have a significant impact on the probability of an individual selecting a certain occupation (see table 2). For the complete estimation results, please refer to table A3 in the appendix. Personality information remains a significant impact factor for occupational choice, even when controlling for human capital variables. As could already be observed in the descriptive statistics, manual workers differ significantly in personality from other occupational groups. For the occupational groups of managers, technicians, and service workers we find supporting evidence for hypothesis 1. Intuitively, individuals with higher levels of extraversion select themselves into occupations that are associated with higher levels of social interaction, for instance as barbers and travel attendants. Compared to manual workers, managers, technicians, and service workers can, on average, be expected to have to deal with more situations involving social interactions. However, extraversion has no significant impact on an individual’s decision to work as a professional or clerk rather than a manual worker, which has already been reported in the descriptive results.

Table 2: Main results of the multinomial logit model

VARIABLE	Managers	Professionals	Technicians	Clerks	Service workers
Extraversion	0.242*** (0.086)	0.030 (0.077)	0.137** (0.065)	0.050 (0.087)	0.240** (0.099)
Neuroticism	-0.007 (0.080)	0.038 (0.073)	-0.040 (0.062)	-0.054 (0.083)	-0.029 (0.093)
Conscientiousness	-0.244*** (0.085)	-0.344*** (0.077)	-0.322*** (0.067)	-0.156* (0.088)	-0.137 (0.107)
Agreeableness	0.058 (0.082)	0.132* (0.074)	0.155** (0.063)	0.017 (0.084)	0.116 (0.096)
Openness	0.131 (0.086)	0.288*** (0.078)	0.180*** (0.066)	-0.025 (0.089)	-0.048 (0.101)
Controls for socioeconomic background, firm size, wage, and industry included (see appendix)					
Constant	-7.914*** (1.242)	-8.759*** (1.069)	-5.143*** (0.895)	-6.431*** (1.217)	-0.259 (1.241)
Observations	4010	4010	4010	4010	4010
Pseudo-R2	0.4044	0.4044	0.4044	0.4044	0.4044

Notes: Own calculations with GSOEP (2005). Standard errors in parentheses. ***(**, *): coefficient is significant at 1% (5%, 10%) level. Base group: Manual workers. See table A3 in the appendix for all coefficients.

Surprisingly, the multinomial logit regression does not support the descriptive finding that neuroticism predicts occupational choice as we do not find any significant effects for this personality trait in the second and full model specification (see table A3 in the appendix). To further explore this unexpected result, we conducted stepwise regressions with the single independent variables, which showed that the significant effects from the bare-bones specification (first specification in table A3) are offset when we included the education variable in the regression. A possible explanation is that emotional stability, i.e., low scores on the neuroticism scale, could rather be a prerequisite to successfully completing a higher and more demanding education. This is supported by recent findings of a longitudinal student sample, suggesting that neuroticism impairs academic performance (see Chamorro-Premuzic & Furnham 2003).

Regarding conscientiousness, the descriptive results already indicate manual workers to report higher levels than other occupational groups. This finding is confirmed by the multinomial logit regressions so that we have to reject hypothesis 3. Our results are in stark contrast to previous findings using different samples. For example, Moutafi et al. (2007) investigated 900 managers of different companies who belonged to three different management levels. Here, higher levels of conscientiousness were positively correlated with managerial level. While we focus on differences between occupational groups in our study, we do not distinguish by managerial level within the occupational group of managers. As already described, we find significant differences between men and women for all Big Five dimensions, women reporting, on average, higher levels for all dimensions, including conscientiousness. Furthermore, Cobb-Clark & Tan (2009) stated that women

select different occupations even if they have similar personality traits to men. For these reasons we concentrated on men, while Ham et al. (2009b) did not restrict their sample. They find that higher levels of conscientiousness significantly raise the probability of an individual becoming a manager or clerk, but their sample encompasses 49.35% females, which might drive this result. Note that, in general, the reported levels of conscientiousness are rather high as this is a socially desirable trait. Maybe individuals whose jobs involve many tasks requiring great precision and accuracy experience themselves as highly conscientious. The group of manual workers in our sample encompasses many jobs which demand a great deal of conscientiousness, even if the tasks seem relatively straightforward (e.g., carpenters, builders, or tailors). In contrast, managers are often faced with complex problems and tasks. Due to time constraints, managers are unable to pay attention to every detail of a situation before they decide on their action. Yet it remains an open question why higher levels of conscientiousness decrease the probability of an individual being a professional or technician rather than a manual worker.

Regarding agreeableness, we observe a significant effect in the expected direction for professionals and technicians. The effect for professionals is not robust as we do not observe it in the estimation of the second model specification. However, this does not confirm our hypothesis of service workers and clerks being more agreeable and friendliness being one of their key competencies when dealing with customers. Other effects might drive this result as service jobs, in particular, can be very demanding. The need to be friendly and act in line with customers' expectations in the occupational context might be counteracted by less agreeableness in the private context. Service workers might put on a different face at work because it is expected of them more than in other occupations, or they might perceive themselves as less agreeable than others because they are used to higher levels of agreeableness in their working environment.² This could also be the result of socialization effects and/or occupational homogeneity at work (see Schneider et al. 1998, Cable & Parsons 2001, and Satterwhite et al. 2009).

An increased value on the openness dimension is associated with an increased probability of an individual being a professional or technician rather than a manual worker, which is in line with hypothesis 5. This effect is highly significant at the 1% level. As we have argued above, this might be the result of the non-routine tasks which can typically be found in such occupations. Both professionals and technicians also need to adapt rather fast to the ongoing technological progress in

² This argument builds on the fact that the personality information gathered within the GSOEP was surveyed in a private context, although the questionnaire partly refers to the work situations.

their working environment. However, the level of openness an individual exhibits does not predict him/her being a manager, which contradicts this part of hypothesis 5.

5. Robustness of the results

We subjected our data and analyses to several robustness checks to ensure the strength of our results. First, to explore the strength of the given personality scale, we conducted a factor analysis with the 15 personality items in the GSOEP questionnaire. The principal component analysis yielded five factors that explain around 60% of the variance in the personality items. According to the Kaiser-Meyer-Olkin measure of sampling adequacy (KMO=75.6), all items are factorizable, which indicates our personality measure to be “pretty good” (Backhaus et al. 2006: 276).

Second, binary logit models (dependent variable: manual worker yes/no) with a variable set that is, at the same time, identical to the multinomial logit model have been estimated, showing manual workers to be significantly (min. 5% level) less extraverted, more conscientious, less agreeable, and less open than other employees (see table A5 in the appendix).

Our sample comprises male employees aged 17 to 84 years. One could argue that the process of occupational choice is not completed in one’s twenties, but more likely toward the end of one’s working life. In view of the research on the stability of personality before the age of 30 (for a controversial discussion, please refer to Roberts et al. 2006a/b and Costa & McCrae 2006), we have limited our analyses to employees aged 30 plus when surveying the 2005 personality information. The results confirm that extraversion is a predictor of an individual becoming a manager rather than a manual worker, but we do not observe this effect any longer for technicians and service workers. The other significant effects observed remain relatively constant as more agreeable employees rather choose to be technicians rather than manual workers; lower levels of conscientiousness predict that an employee becomes a manager, professional, or technician rather than a manual worker, and more openness is associated with a professional or technician rather than a manual worker.³ This indicates that there may be different underlying effects of the extraversion trait stemming from early adulthood. However, we prefer to include employees aged under 30 because they are the major target group of vocational counseling.

There is an ongoing controversial discussion about the direction of the relationship between occupation and personality. On the one hand, personality is expected to influence occupational choice (see, e.g., Tokar et al. 1997). On the other hand, a certain occupation might also influence

³ The results are available from the corresponding author on request.

personality traits (Satterwhite et al. 2009). As we employ a cross-sectional analysis, however, we cannot contribute to this discussion.

To sum up, our empirical analysis reveals a robust impact of personality traits on occupational choice, which enhances our knowledge about the mechanisms of occupational choice, even if human capital effects remain an important determinant.

6. Conclusion

We have investigated the impact of personality traits on occupational choice in Germany. Our findings show that in four of the Big Five dimensions, manual workers differ significantly from most other occupational groups. By adding information about personality to the usual human capital variables, we have increased the explanatory power of the regressions to predict occupational choice. While it is intuitive that managers, technicians, and service workers report higher levels of extraversion than manual workers, our findings on conscientiousness are less obvious. In our sample, manual workers are more conscientious than managers, professionals, clerks, and technicians. This is a surprising finding as previous studies report the opposite. However, they also included women and differ from our approach in other respects.

Further research is needed to examine these differences more closely. Does the size or the selection of the sample influence the result, or are there cultural differences? We do not find significant differences regarding neuroticism, but professionals and technicians report higher levels of openness than manual workers. As we have shown, the robustness of our results has been confirmed.

Many open questions remain for further research. Primarily, it would be interesting to revisit our main research question using panel data from Germany when the Big Five personality scale is included a second time in the GSOEP questionnaire. More research is also needed in the field of job matching theories. Can the Big Five help us understand why individuals switch jobs, and can this knowledge be used to give young men and women advice as to which job would fit them?

Besides human capital variables (e.g., education and experience), personality traits can also shed light on the question of occupational choice. Our results could prove useful for both employers and employees as both sides have a natural interest in achieving the best and therefore most productive match between individuals and jobs.

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Table A1: Items of the BFI-S

BIG FIVE
<p>EXTRAVERSION: <i>I see myself as someone who ...</i></p> <ul style="list-style-type: none"> • is communicative, talkative • is outgoing, sociable • is reserved (-)
<p>NEUROTICISM: <i>I see myself as someone who ...</i></p> <ul style="list-style-type: none"> • worries a lot • gets nervous easily • is relaxed, handles stress well (-)
<p>CONSCIENTIOUSNESS: <i>I see myself as someone who ...</i></p> <ul style="list-style-type: none"> • does a thorough job • tends to be lazy (-) • does things effectively and efficiently
<p>AGREEABLENESS: <i>I see myself as someone who ...</i></p> <ul style="list-style-type: none"> • is sometimes somewhat rude to others (-) • has a forgiving nature • is considerate and kind to others
<p>OPENNESS TO EXPERIENCE: <i>I see myself as someone who ...</i></p> <ul style="list-style-type: none"> • is original, comes up with new ideas • values artistic experiences • has an active imagination

Source: GSOEP (2005). The assessment is based on a seven-point Likert scale (1: does not apply to me at all; 7: applies perfectly). A dimensions' value is calculated as the average of the values of the corresponding items. “(-)” Items are negatively pooled and reversed for calculation purposes.

Table A2: Definition of all variables

VARIABLE	DEFINITION
<i>Occupational status</i>	
Occupation	(1) managers, (2) professionals, (3) technicians, (4) clerks, (5) service workers, (6) manual workers
Manager, Professionals, Technicians, Clerks, Service workers, Manual workers	Dummy variables for each of the categories of <i>Occupation</i> : 1, if person is in this occupational group, else 0.
<i>Personality – Big Five (standardized in the analysis)</i>	
Extraversion	1, does not apply to me at all, 7, applies perfectly.
Neuroticism	1, does not apply to me at all, 7, applies perfectly.
Conscientiousness	1, does not apply to me at all, 7, applies perfectly.
Agreeableness	1, does not apply to me at all, 7, applies perfectly.
Openness	1, does not apply to me at all, 7, applies perfectly.
<i>Socio-economic characteristics</i>	
Age/ Age ²	Age/ Age, squared
Married	1, if a person is married or living with a partner, else 0.
Children	1, if a person has children under 16 years old, else 0.
German citizenship	1, if a person has German citizenship, else 0.
Western Germany	1, if a person is from Western Germany, 0, if from Eastern Germany.
Years of education	Number of years of education
<i>Workplace and employer characteristics</i>	
Wage	Gross wage
Firm size 1-19	1, if firm employs 1-19 workers, else 0.
Firm size 20-199	1, if firm employs 20-199 workers, else 0.
Firm size 200-1999	1, if firm employs 200-1999 workers, else 0.
Firm size 2000+	1, if firm employs 2000 and more workers, else 0.
Agriculture	1, if a person is employed in agriculture, forestry, or fish farming, else 0.
Mining	1, if a person is employed in the mining sector, else 0.
Production of goods	1, if a person is employed in the textile-, leather and wood-working industry; or in the chemical or metal industry; or in the electronic industry; or in hospitality, else 0.
Construction	1, if a person is employed in the machine- and vehicle construction industry, else 0.
Trade	1, if a person is employed in the trade sector, else 0.
Transport	1, if a person is employed in the transportation sector, else 0.
Financial services	1, if a person is employed in the financial service sector, else 0.
Service sector	1, if a person is employed in the service sector including energy and water supply, data processing, culture, sports, and entertainment, else 0.
Non profit	1, if a person is employed in the non-profit sector including health and social work, religious communities of interest, public administration and defence, else 0.

Table A3: Results of the Multinomial Logit Model

VARIABLE	Managers			Professionals			Technicians			Clerks			Service workers		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Extraversion	0.138** (0.061)	0.304*** (0.069)	0.242*** (0.086)	-0.203*** (0.041)	-0.001 (0.062)	0.030 (0.077)	0.088* (0.046)	0.177*** (0.052)	0.137** (0.065)	0.131* (0.070)	0.181** (0.074)	0.050 (0.087)	0.267*** (0.078)	0.252*** (0.080)	0.240** (0.099)
Neuroticism	-0.164*** (0.057)	-0.075 (0.064)	-0.007 (0.080)	-0.203*** (0.040)	-0.023 (0.059)	0.038 (0.073)	-0.158*** (0.044)	-0.075 (0.049)	-0.040 (0.062)	-0.157** (0.067)	-0.071 (0.070)	-0.054 (0.083)	-0.069 (0.072)	-0.022 (0.075)	-0.029 (0.093)
Conscientiousness	-0.169*** (0.060)	-0.187*** (0.068)	-0.244*** (0.085)	-0.344*** (0.041)	-0.247*** (0.061)	-0.344*** (0.077)	-0.339*** (0.045)	-0.297*** (0.052)	-0.322*** (0.067)	-0.329*** (0.066)	-0.279*** (0.071)	-0.156* (0.088)	-0.253*** (0.074)	-0.155* (0.081)	-0.137 (0.107)
Ageeableness	0.025 (0.058)	0.019 (0.065)	0.058 (0.082)	0.103** (0.041)	0.053 (0.061)	0.132* (0.074)	0.148*** (0.046)	0.134*** (0.050)	0.155** (0.063)	0.093 (0.068)	0.080 (0.071)	0.017 (0.084)	0.087 (0.075)	0.081 (0.076)	0.116 (0.096)
Openness	0.315*** (0.061)	0.200*** (0.067)	0.131 (0.086)	0.577*** (0.043)	0.388*** (0.063)	0.288*** (0.078)	0.291*** (0.047)	0.199*** (0.052)	0.180*** (0.066)	0.004 (0.070)	-0.076 (0.073)	-0.025 (0.089)	0.071 (0.076)	0.017 (0.079)	-0.048 (0.101)
Age		0.001 (0.043)	-0.196*** (0.054)		-0.124*** (0.037)	-0.306*** (0.047)		-0.014 (0.030)	-0.177*** (0.039)		-0.067* (0.040)	-0.151*** (0.053)		-0.075* (0.042)	-0.108* (0.060)
Age squared		0.001 (0.000)	0.003*** (0.001)		0.002*** (0.000)	0.004*** (0.001)		0.001 (0.000)	0.002*** (0.000)		0.001* (0.000)	0.002*** (0.001)		0.001 (0.001)	0.001 (0.001)
Married		0.107 (0.165)	0.097 (0.209)		-0.152 (0.150)	-0.376** (0.186)		-0.227* (0.123)	-0.340** (0.159)		-0.251 (0.179)	-0.380* (0.211)		-0.258 (0.197)	-0.083 (0.255)
Children		0.021 (0.150)	-0.016 (0.187)		0.171 (0.138)	0.252 (0.170)		-0.208* (0.116)	-0.113 (0.147)		0.005 (0.163)	0.100 (0.197)		-0.005 (0.174)	0.168 (0.225)
Years of education		0.753*** (0.034)	0.640*** (0.042)		1.094*** (0.033)	0.954*** (0.040)		0.597*** (0.030)	0.486*** (0.038)		0.483*** (0.039)	0.364*** (0.049)		0.194*** (0.052)	0.125* (0.064)
German Citizenship		0.729** (0.289)	0.541 (0.339)		0.816*** (0.276)	0.644** (0.318)		1.436*** (0.257)	1.429*** (0.304)		0.907*** (0.301)	0.967*** (0.358)		0.181 (0.260)	-0.131 (0.341)
West Germany		1.024*** (0.157)	0.185 (0.201)		1.100*** (0.142)	0.547*** (0.180)		1.054*** (0.121)	0.505*** (0.159)		1.562*** (0.214)	1.122*** (0.248)		0.083 (0.166)	0.048 (0.227)
Firm size 11-99			-0.352 (0.239)			-0.368 (0.239)			-0.695*** (0.206)			1.110*** (0.384)			0.164 (0.303)
Firm size 100-199			-0.509 (0.312)			0.299 (0.279)			-0.143 (0.239)			1.736*** (0.413)			0.227 (0.369)
Firm size 200-1999			-0.341 (0.249)			-0.042 (0.238)			-0.272 (0.204)			1.587*** (0.379)			-0.202 (0.344)

VARIABLE	Managers			Professionals			Technicians			Clerks			Service workers		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Firm size 2000+			-0.637** (0.255)			0.192 (0.239)			-0.090 (0.203)			1.294*** (0.379)			0.720** (0.313)
Wage			0.001*** (0.000)			0.001*** (0.000)			0.001*** (0.000)			0.000*** (0.000)			0.000 (0.000)
<i>Industry dummies (Reference: Service sector)</i>															
Agriculture			-18.238 (944.368)			-4.344*** (0.719)			-4.269*** (0.782)			-16.479 (1,253)			-18.025 (1,514)
Mining			-1.869*** (0.507)			-2.309*** (0.442)			-2.020*** (0.365)			-0.625 (0.435)			-2.172*** (0.550)
Production of goods			-1.859*** (0.235)			-2.422*** (0.207)			-1.966*** (0.189)			-1.426*** (0.306)			-5.954*** (1.021)
Construction			-2.803*** (0.374)			-3.250*** (0.339)			-3.563*** (0.357)			-2.378*** (0.573)			-17.795 (671.493)
Trade			0.833*** (0.265)			-2.309*** (0.387)			-0.054 (0.226)			0.636* (0.340)			0.059 (0.258)
Transport			-1.526*** (0.345)			-3.005*** (0.347)			-1.863*** (0.272)			0.616* (0.318)			-3.044*** (0.549)
Financial services			1.726** (0.783)			-0.041 (0.789)			2.058*** (0.754)			4.488*** (0.777)			-21.709 (43,497)
Non profit			-0.146 (0.341)			0.599** (0.266)			1.141*** (0.248)			0.012 (0.435)			1.322*** (0.289)
Constant	-1.559*** (0.056)	-13.737*** (1.036)	-7.914*** (1.242)	-0.564*** (0.039)	-14.985*** (0.884)	-8.759*** (1.069)	-0.871*** (0.043)	-10.179*** (0.707)	-5.143*** (0.895)	-1.939*** (0.066)	-8.359*** (0.894)	-6.431*** (1.217)	-2.142*** (0.072)	-2.813*** (0.879)	-0.259 (1.241)
Observations	4877	4746	4010	4877	4746	4010	4877	4746	4010	4877	4746	4010	4877	4746	4010
Pseudo-R2	0.0260	0.2472	0.4044	0.0260	0.2472	0.4044	0.0260	0.2472	0.4044	0.0260	0.2472	0.4044	0.0260	0.2472	0.4044

Notes: Own calculations with GSOEP 2005. Standard errors in parentheses. ***(**, *): Coefficient is significant at 1% (5%, 10%) level. Reference groups are “1-19 employees”, “service sector”.

Table A4: Summary statistics of the main variables

VARIABLE	Observations	Mean	Std. Dev.	Min	Max
Managers	4877	.0841	.2775	0	1
Professionals	4877	.2381	.4259	0	1
Technicians	4877	.1669	.3729	0	1
Clerks	4877	.0580	.2338	0	1
Service workers	4877	.0474	.2124	0	1
Manual workers	4877	.4056	.4911	0	1
Extraversion	4877	4.7679	1.1045	1	7
Neuroticism	4877	3.6273	1.1646	1	7
Conscientiousness	4877	5.9501	.8767	1.3333	7
Agreeableness	4877	5.2560	.9765	1	7
Openness	4877	4.4776	1.1432	1	7
Age	4877	42.7445	11.8805	17	84
Age ²	4877	1968.21	1022.07	289	7056
Married	4877	.6424	.4793	0	1
Children	4867	.3801	.4855	0	1
German citizenship	4877	.9327	.2505	0	1
West Germany	4877	.7863	.4099	0	1
Years of education	4755	12.8534	2.8992	7	18
Wage	4877	3297.51	2560.23	0	40000
Firm size 1-10	4198	.1758	.3807	0	1
Firm size 11-99	4198	.2246	.4174	0	1
Firm size 100-199	4198	.1020	.3026	0	1
Firm size 200-1999	4198	.2368	.4252	0	1
Firm size 2000+	4198	.2608	.4391	0	1
Agriculture	4746	.0215	.1450	0	1
Mining	4746	.0308	.1727	0	1
Production of goods	4746	.2996	.4581	0	1
Construction	4746	.1001	.3001	0	1
Trade	4746	.0914	.2883	0	1
Transport	4746	.0670	.2501	0	1
Financial services	4746	.0449	.2071	0	1
Other services	4746	.2115	.4084	0	1
Non-profit	4746	.1332	.3398	0	1

Source: GSOEP (2005). Own calculations

Table A5: Main results of the logit analysis (robustness)

VARIABLE	1	2	3
Extraversion	-0.0010 (0.0325)	-0.182*** (0.0413)	-0.134** (0.0552)
Neuroticism	0.168*** (0.0311)	0.0578 (0.0389)	0.0202 (0.0528)
Conscientiousness	0.309*** (0.0328)	0.248*** (0.0420)	0.260*** (0.0577)
Agreeableness	-0.103*** (0.0319)	-0.0873** (0.0390)	-0.109** (0.0530)
Openness	-0.356*** (0.0330)	-0.148*** (0.0409)	-0.115** (0.0557)
Controls for socioeconomic background (age, marital status, origin, human capital)			
		yes	yes
Controls for wage, firm size, and industry sector			
			yes
Constant	-0.402*** (0.0300)	8.082*** (0.522)	3.993*** (0.708)
Observations	4,877	4,746	4,010
Pseudo-R2	0.0371	0.3224	0.5293

Notes: Own calculations with GSOEP (2005). Standard errors in parentheses.
 ***(**, *): Coefficient is significant at 1% (5%, 10%) level. Dependant variable:
 manual workers yes/no