THE EFFECT OF PERSONALITY ON ACADEMIC PERFORMANCE: EVIDENCE FROM TWO UNIVERSITY MAJORS

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ABSTRACT

Our study focuses on the effect of personality type and personality preferences measured by the Myers–Briggs typology, on higher education students' choice of profession and on their academic performance. We statistically analyzed a sample from two slightly similar bachelor majors studied at the University of Debrecen, Hungary, to reveal both the general and major-specific effects of personality. We have found that the most frequent types in both majors were ENFJ and ESFJ; however, differences were revealed in the relative frequencies in the ESTJ, ISTJ and ENFJ types. We identified significant differences between the majors in the average preferences along the introversion-extraversion scale and in the sensing-intuition dichotomies (the latter was significant only for female students). We also found differences in the explanatory power of personality for the two majors and also in the types and preferences which contribute positively or negatively to academic success.

JEL: A22, A23, I21

KEYWORDS: Business Education, Higher Education, Career, Personality Type, MBTI

INTRODUCTION

The social sciences have long been interested in the relationship between personality and career. However, we can examine the effect of personality on the success of an individual in at least 5 phases of his/her career: (1) performance in public education, (2) choice of profession, (3) performance in vocational, professional or higher education, (4) choice of job, and (5) success in the given job, e.g. work performance, income, advancement, and job satisfaction. The earlier phases are likely to have a significant effect on the later ones as they ground the later phases. Empirical studies confirm that personality contributes to personal achievement to at least some degree in public education (e.g. Neuenschwander et al., 2013, Laidra et al., 2007), to decisions about the choice of academic major and profession (e.g. Borges and Gibson, 2005, Cano and Garton, 1994, Hartung et al., 2005, Dunning, 2001, Hinton and Stockburger, 1991, Sears et al., 1997, Ditiberio and Hammer, 1993, Borges and Savickas, 2002), to performance in vocational, professional and higher education (e.g. Borg and Shapiro, 1996, Borg and Stranahan, 2002a, Borg and Stranahan, 2002b, Ziegert, 2000, Ditiberio and Hammer, 1993), to the choice of job (e.g. Lawrence, 1986, Keirsey and Bates, 1984, p. 155-166, Kennedy 2002), and to success in the labor market, whether this is in terms of job performance (e.g. Barrick et al., 2001, Judge and Bono, 2001), wages and advancement (e.g. Andrisani, 1977, 1981, Cobb-Clark and Tan, 2009), or job satisfaction (e.g. Ayan and Kocacik, 2010, Judge et al., 2000, Judge and Bono, 2001, Judge et al., 2005).

Our study contributes to a better understanding of the relationship between personality and career by

answering three research questions. First, it compares the two academic majors in our sample (BA in 'Business Administration and Management' (BAM) and BSc in 'Business Informatics' (BI)) by the personality types of their students, and examines whether there are any significant differences between them, i.e. it searches for results for the second phase. It builds the examination on the Myers–Briggs personality typology (Briggs-Myers et al., 1998). The second research question explores the effect of personality type as an independent variable on academic success in the two selected majors. The third research question focuses on the same role of the four personality preferences underlying the Myers–Briggs typology. In the case of the first research question we have the opportunity to compare our findings to previous research results found in the literature. However, we do not have any information about any examinations similar to our second and third analyses.

The second section of the study briefly introduces the personality typology used in the research and the results of various studies from the literature dealing with similar research questions. The data collection method and the introduction of the sample are included in the third section. The fourth demonstrates the statistical analysis and the results. In the fifth section the conclusions drawn from the empirical findings are presented.

LITERATURE REVIEW

Here we will introduce the Myers–Briggs personality typology used in the research only to the extent necessary for an understanding of the research results. Detailed descriptions are available in several textbooks and studies (e.g. Quenk, 2009, Briggs-Myers et al., 1998, Keirsey and Bates, 1984, Bayne, 1997). The typology of the 16 personality types used in our examination was created by K. C. Briggs and I. Briggs-Myers based on, and complementing, the personality theory of C. G. Jung (Quenk, 2009, p. 1-3). The 16 personality types are defined along 4 preference pairs (called dichotomies): (E) extraversion and (I) introversion, (S) sensing and (N) intuition, (T) thinking and (F) feeling, (J) judging and (P) perceiving. The names of the personality types are traditionally formed by the letter combinations of the preferred 'poles' of each pairs, in the above order (i.e. ESTJ, ISTJ etc.).

The concept of personality preference has no formal definition but can be described as 'feeling most natural and comfortable with' (Bayne, 1997, p. 4). According to Bayne, preferences have a strong influence on, but are not identical to, behavior, because behavior is usually affected by many other factors simultaneously. All the eight preference-poles are used at least some of the time by all individuals, although the preferred ones tend to be used more frequently. The official instrument used to measure the preferences – and hence types – was also developed; this is the Myers–Briggs Type Indicator® (MBTI®) (Quenk, 2009, p. 1-3). However, many other assessment instruments exist that are capable of categorizing people into the 16 Myers–Briggs personality types (e.g. Hogan and Champagne, 1980, Keirsey, 1998); sometimes not only the instrument but also the underlying theory is misleadingly referred to as MBTI.

The first dichotomy, termed 'the opposite attitudes of energy' (Quenk, 2009, p. 8), is extraversion versus introversion. In Jungian terminology extraversion means outward-turning, while introversion means inward-turning. The extraverted attitude directs psychic energy to, and receives energy from, the outer world of people, things, and action. People with an extraverted preference like actively engaging others, acquiring experiences through a trial-and-error approach and they think more effectively when interacting with others. The introversion attitude is the opposite. It directs psychic energy to the inner world of ideas and reflection, and it acquires energy from operating there. Introverted people tend to think internally and they can work alone effectively.

The second dichotomy is 'the opposite functions of perception': sensing and intuition (Quenk, 2009, p. 6). A person who prefers 'sensing perception' focuses on concrete reality, gathering facts and details of the present by using the five senses. A sensing person tends to be less interested in hypotheses and future

possibilities. Intuition deals with the patterns, concepts, ideas, theories, and connections among diverse pieces of information. It is harder for an intuitive person to remember and use facts and data without a meaningful context.

The third pair of opposite categories is 'the opposite functions of judgment': thinking and feeling (Quenk, 2009, p. 6-7). 'Thinkers' apply specific criteria and principles in a linear, logical and impersonal analysis of information to get as close to the objective truth as it is possible. Feeling-based judgment tends to apply personally held values to assess the relative importance of the information at hand. When a person who prefers feeling makes a decision, his or her primary concern is the consequences of the decision as they affect individuals or groups.

The last dichotomy is 'the opposite attitudes toward the outside world': judging and perceiving (Quenk, 2009, p. 8-9). Those who prefer a judging attitude are organized, structured, work effectively within schedules, and wish to reach a conclusion or make a decision quickly. 'Perceiving' decision makers like to collect as much information as possible before coming to a conclusion. They are flexible, adaptable, and spontaneous when working in the outside world.

It is possible to draw conclusions regarding someone's personality directly from their preferences (e.g. Hogan and Champagne, 1980), too, and not only from the types. Our study will do the same in the Results and Discussion chapter. Moreover, some authors have introduced alternative combinations of preferences at variance with the original sixteen types system, such as the four temperaments of Keirsey and Bates (1984).

Many previous studies have examined the relationship between higher education students' Myers–Briggs personality types and their performance in various fields of college or university studies. We will briefly summarize the findings of those closest to our research questions. Borg and Shapiro (1996) found that for students on Principles of Macroeconomics courses personality preferences measured by MBTI had a significant influence on academic success. Borg and Shapiro (1996) tested three models on 119 students who completed the above named course in 1990 at the University of North Florida (UNF). First, they measured the effect of the type, and found that ENTP, ESTP and ENFP students did significantly worse than the ISTJs (which was the most frequently occurring personality among the students). The independent effect of the four MBTI preferences on grades was also examined, demonstrating that being an introvert had a significant positive effect on the chance of getting a good grade. On the same sample Borg and Stranahan (2002a) later provided support for the hypothesis that race and gender combined with personality temperament form more subtle, interactive effects on a student's performance in Principles of Macroeconomics.

Ziegert (2000) replicated Borg and Saphiro's work cited above with a larger sample (617 students) from Miami University. The course examined was Microeconomics Principles. She also extended the examination, introducing the pre-course and post-course TUCE (Test of Understanding College Economics) scores as an alternative proxy for learning performance, with 400 and 300 students. The TUCE is considered to be a more precise and consistent measure of student performance than course grades, because it avoids instructor-specific evaluation differences. The author finds that the ENTP, ESFJ, INFP and ENTJ personality types perform significantly worse in terms of grades than the ISTJ type. With the post-TUCE score as a dependent variable, the analysis showed the ISTJ type students achieved significantly higher performances than ESFP, ENFP, INFJ, ENFJ, ESFJ, INFP, ISFJ and ESTJ students, while INTJ students significantly outperformed them. Ziegert also calculated the post-TUCE minus pre-TUCE scores, to measure the knowledge increase during the course. With the latter as a dependent variable, ESFP, ENFP, ENFJ, INTJ, ESFJ, INFP, ISFJ and ESTJ students differed significantly from the ISTJ students. INTJs performed better than them, the others were worse. Ziegert also examined the effect of the four personality preference scales and found that the sensing and the thinking preferences

contributed positively to grades, while for the post-TUCE score only the judging preference was insignificant, and while the sensing preference modified the post-TUCE performance negatively. Only the thinking dimension had significant, positive effects on the knowledge increase during the semester (post-TUCE minus pre-TUCE).

Borg and Stranahan (2002b) continued Borg, Shapiro and Ziegert's line of research and investigated the personality effects on a sample of 166 UNF students from three advanced-level economics courses. They found only the effect of the introversion type significant (in their model the four dichotomies were represented by dummy variables); this had a positive effect. They did not measure the effect of the 16 types.

The above cited studies focused on the connection between personality and academic success in one course (Borg and Shapiro, 1996, Ziegert, 2000), or in only a small number of similar courses (Borg and Stranahan, 2002b). However, the students' most important decisions are made when they choose a profession, a major, a specialization or an educational institution, and in doing this, a given combination of heterogeneous courses, and not when they choose an individual course. For this reason the authors of the current study aimed to use a modified version of the above cited research on two majors which are different but overlap to some extent, thereby emphasizing the role of measurable personality elements in making a better career choice at the higher education level.

DATA AND METHODOLOGY

Our data on personality and academic achievement was based on our primary questionnaire survey at the Faculty of Economics and Business Administration at the University of Debrecen, Hungary. The survey was implemented in October and November 2011, in classes where attendance was obligatory. BA in Business Administration and Management (BAM) and BSc in Business Informatics (BI) students in their second and third year made up our sample. The total number of the sample was 354, with 102 second and 122 third year BAM students (224 in total) and 79 second and 51 third year BI students (130 in total). The Business Administration and Management major is run by the Faculty of Economics and Business Administration (FEBA) and focuses mostly on management, and partly on economics studies, whilst the other major combines informatics with management courses, and is part of the Faculty of Informatics (FI), and the FEBA only teaches these students management studies. Thus, accepting that different personalities fit different professions, it seems reasonable to expect differences in personality types and preference distributions between students on the two majors; moreover we can expect to find that types and preferences are connected in different ways to their academic success.

To measure the personality preferences we used a questionnaire containing 72 forced choice questions. We also asked the respondents to give their sex and year of birth, whether they had worked before, whether they are studying on more than one major simultaneously, whether their permanent abode was in the same city as the university, and if not, how much time they spent travelling between their home and the university (in minutes). Table 1 includes the explanation of the independent and dependent variables we used in the study, while Table 2 summarizes the frequency, mean and standard deviation data of the independent and dependent variables grouped by majors and university years.

Table 1: Explanation of Variables

Variable Name	Explanation
SEX	1 if the student is female, 0 if male.
AGE	Age of the student in years. This was calculated as the difference between the date the questionnaire was filled in and the year of birth (the assumed birthday was 1st July).
LOCAL	1 if the student is a local resident, 0 otherwise.
DISTANCE	Traveling time between the student's home and the university in minutes.
PLUSMAJOR	1 if the student has more than one major, 0 if not.
WORK	1 if the student has any work experience (past or present), 0 if not.
MBTI TYPE	Dummy variables indicating the 16 Myers–Briggs personality types. 1 if the student belongs to the given type, 0 otherwise.
MBTI PREFERENCE	Strength of a student's preference in each of the 4 Myers–Briggs dichotomies, measured in percentages. If a preference is p, the opposite preference of the dichotomy is $(100 – p)$.
INDEX	Average of a special form of grade index officially termed 'stipend index' of the previous two academic semesters (1.00 is the minimum, 5.00 is the maximum). The stipend index is calculated as the product of the credit values of subjects graded as 'pass' or higher multiplied by their grades divided by the total number of credits undertaken.
STDINDEX	INDEX standardized by majors and university years.

This table includes the explanation of the independent and dependent variables we used in the study.

Table 2: Frequencies, Means and Standard Deviations of Variables by Majors and University Years

Variables	Business Administration and Management						Business Informatics						Total		
	2nd Year			3rd Year			2nd Year			3rd Year					
	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.	N	Mean	Std. Dev.
SEX	102	0.6765	0.4701	122	0.5574	0.4987	79	0.2025	0.4045	51	0.2549	0.4401	358	0.4689	0.4997
YEAR OF BIRTH	101	1,990.8	0.7755	119	1,989.7	0.8473	79	1,990.4	1.278	51	1,989.0	1.076	354	1,990.1	1.159
AGE	101	20.417	2.183	119	21.212	3.484	79	21.053	1.372	51	22.407	1.076	350	21.123	2.593
LOCAL	99	0.2828	0.4527	120	0.3750	0.4862	78	0.2436	0.4320	48	0.2917	0.4593	348	0.3072	0.4620
DISTANCE	98	69.327	83.939	120	54.517	68.160	77	67.883	73.200	48	59.854	66.464	346	62.496	73.864
PLUSMAJOR	102	0.0392	0.1951	122	0.0410	0.1991	79	0.0000	0.0000	51	0.0196	0.1400	358	0.0282	0.1659
WORK	96	0.4583	0.5009	122	0.6066	0.4905	77	0.6753	0.4713	51	0.5294	0.5041	358	0.5694	0.4959
INDEX	102	3.137	0.5953	122	3.124	0.6521	79	2.722	0.7269	51	2.860	0.6976	358	3.000	0.6810

This table summarizes the frequency, mean and standard deviation (Std. Dev.) data of the independent and dependent variables grouped by majors and university years.

RESULTS AND DISCUSSION

To examine the personality type differences by majors, we analyzed the distribution of the 16 personality types on the two selected majors, first independently and then on the combined sample. The university year of students was not taken into consideration at this stage, because the distribution of personality types did not depend on the courses studied in a given year but on the selection of profession students had made by choosing a particular major. We presented the findings in Table 3. Types appear in the table in the descending order of their frequency in the combined sample. Ranks were also calculated from the relative frequency (ratio) of the type within the different samples. We used rank means, if this ratio was the same for more than one type.

One can observe various differences between the majors. Many personality types are ranked differently on the two majors. The greatest differences can be found in the following cases (the absolute value of the difference between ranks on the two majors are in parentheses): the Business Administration and Management (BAM) major has higher ranks for types INTJ (2.5), ESTJ (2), ENTP (2), and lower for ISTJ (4) and INFJ (3) than the Business Informatics (BI) major. The relative frequencies of ISTJ (0.0800), ISFJ (0.0400), INFJ (0.0300), ENFP (0.0200) and ISTP (0.0100) types were greater in the BAM major, and the ESTJ (0.1000), ENFJ (0.0600), ESFJ (0.0100) and ENTP (0.0100) types in the BI major (the absolute values of the difference between relative frequencies are in parentheses). In Table 3 italic

fonts show those types that have a frequency great enough to use statistical measures on them to compare the two majors by the distribution of personality types. Tables 4, 5 and 6 present the measures computed.

Table 3: Distribution of Personality Types in Majors (Frequencies, Ratios, Ranking Orders)

Type	Business Administration and Management			Business Informatics			Total		
	Frequency	Ratio	Rank	Frequency	Ratio	Rank	Frequency	Ratio	Rank
ESFJ	46	0.2100	1	30	0.2200	1	76	0.2100	1
ENFJ	32	0.1400	2	27	0.2000	2	59	0.1600	2
ESTJ	21	0.0900	5	26	0.1900	3	47	0.1300	3
ENTJ	22	0.1000	4	13	0.1000	4	35	0.1000	4
ISTJ	27	0.1200	3	6	0.0400	7	33	0.0900	5
ISFJ	20	0.0900	6	7	0.0500	5.5	27	0.0800	6
INTJ	12	0.0500	8	7	0.0500	5.5	19	0.0500	7
ENFP	12	0.0500	8	4	0.0300	9	16	0.0400	8
INFJ	12	0.0500	8	3	0.0200	11	15	0.0400	9
ESFP	7	0.0300	10	4	0.0300	9	11	0.0300	10
ENTP	5	0.0200	11	4	0.0300	9	9	0.0300	11
ESTP	3	0.0100	12	2	0.0100	12	5	0.0100	12
INTP	2	0.0100	13.5	1	0.0100	13	3	0.0100	13
ISTP	2	0.0100	13.5	0	0.0000	15	2	0.0100	14
INFP	1	0.0000	15	0	0.0000	15	1	0.0000	15
ISFP	0	0.0000	16	0	0.0000	15	0	0.0000	16
Total	224	1.000		134	1.000		358	1.000	

This table presents the frequencies, relative frequencies (named Ratio) and ranking of personality types in the two majors and in the combined sample (Total). Italic fonts show those types that have a frequency great enough to use statistical measures on them to compare the two majors by the distribution of personality types.

The measures in Tables 4, 5 and 6 calculated for the group of ESFJ, ENFJ, ESTJ, ENTJ, ISTJ, ISFJ, INTJ, ENFP and INFJ type students in BAM and BI majors support the idea that students on the 2nd and 3rd year of BAM tend to be different in their personality types from their BI counterparts. This difference is significant by most measures (the only exception was the lambda) at the 0.05 level. However, the association is weak (the value of symmetric measures are between 0.23 and 0.24).

Table 4: Chi Square Tests

Measure	Value	DF	Asym. Sig. (2-Sided)
Pearson Chi-Square	18.018	8	0.0211
Likelihood Ratio	18.698	8	0.0166
N of Valid Cases	327		

This table presents the values, degrees of freedom, and asymptotic significance levels for the Person Chi square test and the Likelihood ratio. 0 cells have expected count less than 5. The minimum expected count is 5.642.

Table 5: Symmetric Measures

Measure	Value	Approx. Sig.
Phi	0.2347	0.0211
Cramer's *V*	0.2347	0.0211
Contingency Coefficient	0.2285	0.0211
N of Valid Cases	327	

This table presents the values and approximate significance levels for the Phi, Cramer's V and Contingency coefficient measures.

We also tested whether the average preferences differ significantly for the two majors. Table 7 includes the preference means and standard deviations by major and sex. With an independent samples *t*-test we analyzed the existence of significant differences between females and males on the two majors by the 4 dichotomies. BAM male students were significantly more introverted ($t = 2.599$, df = 162.06) than their

BI counterparts at the 0.05 level, and they were also more intuitive on average ($t = 1.709$, df = 186.00), at a 0.10 level of significance. Female students were more intuitive on average if they were studying on the BI major ($t = -1.693$, df = 164.00). On the combined sample by sex, an average BAM student was significantly more introverted at the 0.05 level ($t = 2.532$, df = 306.47).

Table 6: Directional Measures

Measure	Value	Asymp. Std. Error[a]	Approx. T[b]	Approx. Sig.
Lambda (symmetric)	0.0134	0.0182	0.7299	0.4654
Lambda (major is dependent)	0.0407	0.0546	0.7299	0.4654
Goodman and Kruskal tau (major is dependent)	0.0551	0.0238	–	0.0215[d]
Uncertainty Coefficient (symmetric)	0.0210	0.0094	2.238	0.0166[e]
Uncertainty Coefficient (major is dependent)	0.0432	0.0193	2.238	0.0166[e]
N of Valid Cases	327			

This table contains the values, asymptotic standard errors, approximate t statistics, and approximate significance levels for three directional measures. a. Not assuming the null hypothesis; b. Using the asymptotic standard error assuming the null hypothesis; c. Cannot be computed because the asymptotic standard error equals zero; d. Based on chi-square approximation; e. Likelihood ratio chi-square probability.

Table 7: Average Personality Preferences by Major and Sex (Means and Standard Deviations)

Preference	Business Administration and Management				Business Informatics			
	Males N = 87		Females N = 137		Males N = 101		Females N = 29	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Introversion	41.897	26.225	38.518	24.370	32.861	20.553	35.655	23.725
Intuition	53.230	14.759	47.168	16.860	49.703	13.531	52.931	15.588
Thinking	53.333	17.110	41.248	16.110	49.317	16.435	37.931	15.358
Perceiving	46.667	17.110	58.752	16.110	50.683	16.435	62.069	15.358

This table presents the means and standard deviations of four preference-poles, divided by major and sex.

Beside the examination of the personality type differences by majors, this part of the study also examines the contribution of the Myers–Briggs personality types to the students' academic achievement in both majors individually, and then compares the results. Our models took into consideration the effect of certain demographic and background factors, thus the 'starting' equation used in the linear regression analysis was the following:

$$\text{STDINDEX} = f\,(\text{SEX, AGE, LOCAL, WORK, PLUSMAJOR, MBTI TYPE}) \qquad (1)$$

The DISTANCE variable was left out from the independent variables in all models, because it had similar content to the LOCAL variable, and LOCAL fitted the models better. The dependent variable was STDINDEX rather than INDEX, to focus on the academic success of a student compared to the average of his/her own year and major; this also enabled comparison between the majors examined. We have also used 'reduced' models, where only those independent variables were introduced that were significant at least at the 0.10 level. Table 8 reports the results of the linear regression analysis for the two starting, and the two reduced, models. The ESFJ dummy variable was omitted from the models, because this was the most frequent of all the 16 personality types.

In the starting model of the BAM major three personality types contributed significantly to the dependent variable at the 0.10 level. INFP, ENFJ and ISFJ type students tend to have lower stipend indices than those with the ESFJ type. Besides personality types, being female, being a local resident and having some work experience had a significant effect on the dependent variable at the 0.1 level: female students and locals outperformed the males and those living in another settlement, but those who were, or had been, employed were underperformers.

Table 8: Results of Linear Regression Models with Personality Types

Dependent Variable: Standardized Average of Stipend Indices (STDINDEX)								
Independent Variable	Business Administration and Management				Business Informatics			
	Starting Model N = 210		Reduced Model N =218		Starting Model N = 124		Reduced Model N = 130	
	Estimate	t	Estimate	t	Estimate	t	Estimate	t
CONSTANT	-0.1948	-0.1310	0.1142	0.8506	0.1867	0.1194	-0.1378	-1.269
SEX	0.4742***	2.867	0.4063***	2.934	0.3324	1.377	0.3636*	1.743
AGE	0.2667	1.818	–	–	-0.0174	-0.2416	–	–
LOCAL	-0.4118*	-2.839	–	–	0.2156	1.029	–	–
WORK	0.0098***	0.1377	-0.4100***	-3.097	0.2267	1.167	–	–
PLUSMAJOR	0.0939	0.2643	–	–	-0.8635	-0.8134	–	–
INTP	0.1363	0.1400	–	–	-0.3381	-0.3315	–	–
ENTP	0.0826	0.1746	–	–	0.0256	0.0477	–	–
INTJ	0.2490	0.7006	–	–	0.0898	0.2131		
ENTJ	-0.0397	-0.1514	–	–	-0.1918	-0.5327	–	–
INFP	-2.480**	-2.343	-2.204**	-2.304	–	–	–	–
ENFP	-0.4744	-1.322	–	–	-0.5096	-0.9401	–	–
INFJ	0.3057	0.9613	–	–	0.3810	0.6205	–	–
ENFJ	-0.4038*	-1.809	-0.3769**	-2.012	0.2648	0.9158	0.4300*	1.958
ESFP	-0.5615	-1.324	–	–	-1.088**	-2.013	-0.9076*	-1.803
ISTP	-0.1209	-0.1706	–	–	–	–	–	–
ESTP	-0.0308	-0.0532	–	–	-1.247	-1.643	–	–
ISTJ	-0.1673	-0.6701	–	–	-0.1888	-0.3859	–	–
ESTJ	0.2247	0.8373	–	–	-0.2973	-1.033	–	–
ISFJ	-0.6319**	-2.310	-0.6205***	-2.638	-0.0789	-0.1751	–	–
F	2.269***		6.929***		1.063		3.215*	
R^2	0.1849		0.1405		0.1457		0.0711	
adjusted R^2	0.1034		0.1202		0.0086		0.0490	

*This table shows the results of linear regression analyses for two models per major, investigating the contribution of personality types to the standardized grade average. Starting models are containing all independent variables, while reduced models are containing only the significant ones. The estimate label indicates the estimations of the regression coefficients. Label t refers to the value of the t statistics. * Significant at the 0.10 level; ** significant at the 0.05 level; *** significant at the 0.01 level.*

The whole model explained slightly more than 10 percent of the total variance of the dependent variable. In the BI major only the ESFP students showed an inferior performance compared to those with the ESFJ type, but in this case the model was not significant according to the F test, thus the result should be treated with caution. In addition to these findings, for both majors there exist reduced models that are significant at least at the 0.10 level. In the case of the BAM major the reduced model explains approximately 12 percent of the variance, and almost 5 percent in the case of the BI major. In the reduced model for the BI major, being female and having an ENFJ personality had a positive relationship, and being an ESFJ type had a negative relationship, to the stipend index. For the BAM major the reduced model showed the same significant variables as the starting one. From these results it can be additionally concluded that for BI students Myers–Briggs personality types played a significantly less important role in academic performance than for BAM students.

Complementing the previously introduced analysis with the 16 personality types, we also examined the relationship between academic success and personality preferences instead of personality types. In this part of the empirical analysis two starting and two reduced models were tested for both BAM and BI majors to reveal how much the four personality preferences contributed to the – standardized – stipend index. Thus the starting empirical model was:

$$STDINDEX = f (SEX, AGE, LOCAL, WORK, PLUSMAJOR, MBTI PREFERENCE) \qquad (2)$$

The DISTANCE variable was left out for the same reason as previously. Reduced models were developed again via the elimination of independent variables not significant at the 0.10 level. Table 9 presents the results of the four linear regression analyses. Starting and reduced models for both majors were all significant at the 0.01 level (tested with the F test). For those Business Administration and Management

students who were female, lived in the city of the university or had greater judging preference (i.e. a lower perceiving preference) the standardized average of stipend indices (STDINDEX) tended to be higher, whilst for those who had any work experience it tended to be lower. In the case of Business Informatics students the intuitive and perceiving preferences had a negative effect on their academic performance. Demographic variables showed no impact on stipend indices in the latter major.

Table 9: Linear Regression Models for the Effect of Personality Preferences

Dependent Variable: Standardized Average of Stipend Indices (STDINDEX)								
Independent Variable	**Business Administration and Management**				**Business Informatics**			
	Starting Model $N = 210$		**Reduced Model** $N = 222$		**Starting Model** $N = 124$		**Reduced Model** $N = 133$	
	Estimate	**T**	**Estimate**	**T**	**Estimate**	**T**	**Estimate**	**T**
CONSTANT	0.6807	0.4654	0.3726**	2.222	-0.1393	-0.1039	0.1249	0.3839
SEX	0.3363**	2.154	0.2407*	1.784	0.1608	0.7426	–	–
AGE	-0.0238	-0.3465	–	–	0.2402	1.261	–	–
LOCAL	0.2892**	2.010	–	–	0.1570	0.9000	–	–
WORK	-0.3604**	-2.557	-0.3570***	-2.696	-1.196	-1.244	–	–
PLUSMAJOR	-0.1655	-0.5011	–	–	-0.0031	-0.7369	–	–
INTROVERSION	-0.0044	-1.504	–	–	0.0119	1.969	–	–
INTUITION	0.0032	0.7659	–	–	-0.0063*	-1.161	0.0113**	1.984
THINKING	0.0035	0.8480	–	–	-0.0219	-4.564	–	–
PERCEIVING	-0.0137***	-3.647	-0.0104***	-3.048	0.0197***	0.3208	-0.0226***	-4.973
F		4.123***		9.784***		3.400***		14.186***
R^2		0.1565		0.1187		0.2116		0.1791
adjusted R^2		0.1185		0.1065		0.1494		0.1665

This table shows the results of linear regression analyses for two models per major, investigating the contribution of personality preferences to the standardized grade average. Starting models are containing all independent variables, while reduced models are containing only the significant ones. The estimate label indicates the estimations of the regression coefficients. Label t refers to the value of the t statistics.
* Significant at the 0.10 level; ** significant at the 0.05 level; *** significant at the 0.01 level.

CONCLUDING COMMENTS

The goal of our paper is to contribute to a better understanding of the relationship between personality and career. Our first research question was designed to reveal the personality types of the two selected majors and to assess whether there is a difference between the majors according to the student personality types. The second research question examined the role of personality types as a predictor of academic performance, while the third focused on the same role of the four personality preferences underlying the Myers–Briggs typology. Our data was based on our primary questionnaire survey of 224 BA in Business Administration and Management (BAM) and 130 BSc in Business Informatics (BI) students. To answer the first research question we used frequency and cross table analyses, the second and third research questions were examined with linear regression analyses.

In the case of the first research question, we have found that the most frequent types in both majors were ENFJ and ESFJ; however, the frequencies of the personality types showed slight differences regarding the majors. In terms of the relative frequencies the three greatest differences were found in the ESTJ, ISTJ, and ENFJ types. The differences between the majors were also confirmed by association measures. We found significant deviations between the students in the two majors in terms of their preferences. Male students were more introverted and intuitive in the BAM major than in the BI major, whilst female students tended to be more intuitive in the BI major. If sex was not taken into consideration, an average BAM student was more introverted than an average BI student. Answering the second research question, we showed that in the BAM major INFP, ENFJ, and ISFJ students achieved a significantly lower performance than ESFJ students, who acted as the benchmark as the majority of students fell into the ESFJ group. In the BI major ENFJ-type students produced a better performance while ESFP-type students fared worse than the ESFJ-type. Personality had a lower level of explanatory power in the case of the BI major than in the case of the BAM major. For the third research question, we experienced differences in

the performance predictor role of personality preferences between the two majors, too. The perceiving preference had a significant negative effect on academic performance in each of the majors. Beside this, in the BI major the positive effect of intuition was also detectable.

We draw the conclusion that the two examined majors – even if only slightly – created different frameworks for the effect of personality on academic performance. Other majors may have different patterns of personality preferences and types; moreover, the nature of the relationship between personality and academic success may also vary. However, personality and its impact on academic performance may be affected by cultural traits, as well. Future research might extend our examination to other business and non-business major programs to reveal the common and specific patterns in the contribution of personality to the academic success in business and management education. Future studies might also focus on the use of personality tests in educational and career counseling.

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