ROCZNIKI PSYCHOLOGICZNE
2016, XIX, 1, 121-137
ENGLISH VERSION

DOI: http://dx.doi.org/10.18290/rpsych.2016.19.1-4en

MAGDALENA KACZMAREK
SWPS University of Social Sciences and Humanities
Faculty of Psychology
PIOTR KACZMAREK-KURCZAK
Kozminski University, Warszawa

# PERSONALITY TRAITS AND SELF-EFFICACY AS PREDICTORS OF BUSINESS PERFORMANCE: A LONGITUDINAL STUDY

The aim of this study was to analyze the role of the five-factor model (FFM) of personality and self-efficacy as predictors of business performance in nascent entrepreneurs in cultural and creative industries (n = 81). The study was prospective and longitudinal – the assessment of personality preceded the start of a self-owned business by the participants – and an assessment of business performance was conducted twice: seven months and abouta year after starting the business. The results showed that the participants wereless neurotic, more extraverted, more open to experience, and more conscientious and had a stronger sense of general self-efficacy in comparison to the general population. The FFM traits were weak but significant predictors of business performance; the strongest predictive traits were extraversion, neuroticism, and entrepreneurial self-efficacy. Some analyses including neuroticism and extraversion supported the hypothesized mediating role of self-efficacy in the relationship between personality traits and some indices of business performance. The results are discussed in the context of previous studies, including meta-analyses.

**Keywords:** FFM personality traits; self-efficacy; entrepreneurship.

Address for correspondence: MAGDALENA KACZMAREK – Faculty of Psychology, SWPS University of Social Sciences and Humanities, ul. Chodakowska 19/31, 03-815 Warszawa; e-mail: mkaczma1@swps.edu.pl

Research was financially supported by the Polish Ministry of Science and Higher Education (program WP/2014/A 17).

## INTRODUCTION

The last two decades have been very important for the psychology of entrepreneurship and particularly fruitful for research on and the development of theoretical concepts regarding the role of individual differences in entrepreneurial activity (cf. Brandstätter, 2011). The results of quantitative reviews of previous studies demonstrated the importance of the personality characteristics of entrepreneurs.

In response to the complaints regarding the relatively atheoretical perspective of most of the studies on the role of personality traits and entrepreneurship, Zhao et al. made an attempt to integrate the previous results in the light of the five-factor model of personality (FFM), which was used as the reference system for the categorization of individual personality traits applied in numerous previous studies (Zhao & Seibert, 2006; Zhao, Seibert, & Lumpkin, 2010). They suspected that all five dimensions of personality were related to entrepreneurial intention and entrepreneurial performance:

– neuroticism (negatively) – because of stress tolerance and the acceptance of risk-taking;

– extraversion (positively) – because of the energy level, activity level, risk-taking behavior, dominance, and optimism;

– openness to experience (positively) – because of creativity, curiosity, and independence;

– agreeableness (negatively)– because of dominance, independence, and competitiveness;

– conscientiousness (positively) – because of motivation to achieve, hard work, and tenacity.

Most of the hypotheses were confirmed. However, the comparison between entrepreneurs and managers showed that extraversion did not differ between these roles, and agreeableness was not related to entrepreneurial intention or performance (cf. Zhao & Seibert, 2006; Zhao et al., 2010).

The weakness of such studies is that they are based on characteristics of personality that are not defined as FFM traits and could only be interpreted as related to them in terms of content. Using the FFM inventory, Ciavarella, Buchholtz, Riordan, Gatewood, and Stokes (2004) found that only conscientiousness predicted business success (in this case, the survival of the venture) and openness to experience was related negatively to business success, whereas a positive relationship had been hypothesized. Their study was conducted as longitudinal, but

a majority of research in this area is cross-sectional, which can be also treated as a methodological weakness.

Rauch and Frese (2007b) presented a meta-analysis in which research results on most of the previously studied personality traits were analyzed in terms of how strongly these traits related to the task of running a business. The study demonstrated the importance of general self-efficacy. This self-belief appeared to be one of the most important factors predicting entrepreneurial activity and successes (other predictors included theneed for achievement, innovativeness, proactive personality, or stress tolerance); the corrected *r* was .38 for business creation and .25 for business success (cf. Rauch & Frese, 2007b).

Bandura (2012) criticizes the concept of general self-efficacy and favors a theory based on domain-specific self-efficacy. Chen, Green, and Crick (1998) studied the understanding of self-efficacy in the context of entrepreneurial psychology; the role of entrepreneurial self-efficacy was tested and received empirical support. Entrepreneurial self-efficacy (ESE) is related directly to the beliefs in one's own agency in tasks and roles undertaken in the process of starting and running a self-owned business.

In Polish research, Tyszka, Cieslik, Domurat, and Macko (2011) confirmed that general self-efficacy was significantly higher in nascent entrepreneurs, but only in those who were classified as opportunity-driven to start their own business. Moreover, Łaguna (2010) adapted the construct of entrepreneurial self--efficacy to the Polish conditions. In her empirical investigations on entrepreneurial activity, she established that ESE was a more important and more systematic predictor in the process of achieving goals than other aspects of the self--concept, such as self-esteem or hope for success.

Although the FFM of personality and the social cognitive theory appear to be very different theoretical points of views, there have been attempts to conceptualize them in one research model on entrepreneurship. Rauch and Frese (2007a) proposed to distinguish between broad and specific personality traits. The broad traits are the FFM personality traits, and their effect on variables such as business creation and success is mediated by specific characteristics such as self-efficacy. The influence of the FFM personality traits could also be mediated by many other specific characteristics, such as a need for achievement or a propensity for risk taking. Such an understating of the role of general personality traits in predicting specific behaviors is analogous to that which underlies the model proposed by Costa and McCrae, who recognized them as basic tendencies rooted in human biology that predict objective biographical facts only indirectly,

*via* dynamic processes that relate the FFM traits to characteristic individual adaptation, which comprises aspects such as self-concept (Costa & McCrea, 2011).

The hypothetical relationship between the FFM and self-efficacy proposed by Bandura (2012) is similar; however, in Bandura's model, the role of the FFM personality traits is diminished and domain-specific self-efficacy is considered to be a notably more important predictor of behavior. The results of a meta-analysis showed the average correlation between self-efficacy and work performance to be $r$ =.38 (Stajkovic & Luthans, 1998). However the meta-analysis conducted by Judge, Jackson, Shaw, Scott, and Rich (2007), in which the FFM traits were included in addition to self-efficacy, general mental ability, and experience as predictors of performance at work, resulted in little support for the hypothesis of the crucial role of self-efficacy. In this analysis, general mental ability, experience, and conscientiousness were significantly related to performance, and the other FFM traits as well as self-efficacy were not its statistically significant predictors. Although conscientiousness, emotional stability (the opposite of neuroticism) and extraversion were positively related to self-efficacy, extraversion was not related to performance, and the mediation hypotheses were not confirmed. Bandura (2012) criticized this meta-analysis from a methodological point of view and citedthe unpublished results of analyses conducted by Stajkovic et al. (2010; see: Bandura, 2012), which showed a significant influence of self-efficacy on performance as well as a marginal role of the FFM traits, except for conscientiousness.

Finally, the concept of business performance needs to be clarified. Scholars have used a wide variety of indicators to assess entrepreneurial performance – starting from financial indicators such as sales revenue, profit, liquidity, return on investment, and return on assets, through indicators such as firm size (the number of employees), productivity, and firm survival, to subjective ratings of overall performance (cf. Zhao et al., 2010). However, in the very early stages of company development, the applicability of such performance indicators is limited. Therefore, to describe the activities of nascent firms, a different approach is applied, in which many types of resources are taken into account (Dollinger, 2002). This assessment covers not only the level of accumulated financial capital, but also other categories of resources, such as the entrepreneur's intellectual, social, and human resources (competences, knowledge, social network) or the company's technological resources (access to technologies and the ability to use them).

Summing up,the hypothetical relationships among the FFM traits, general and entrepreneurial self-efficacy, and the indicatorsof business performance tested in the study are shown in Figure 1.

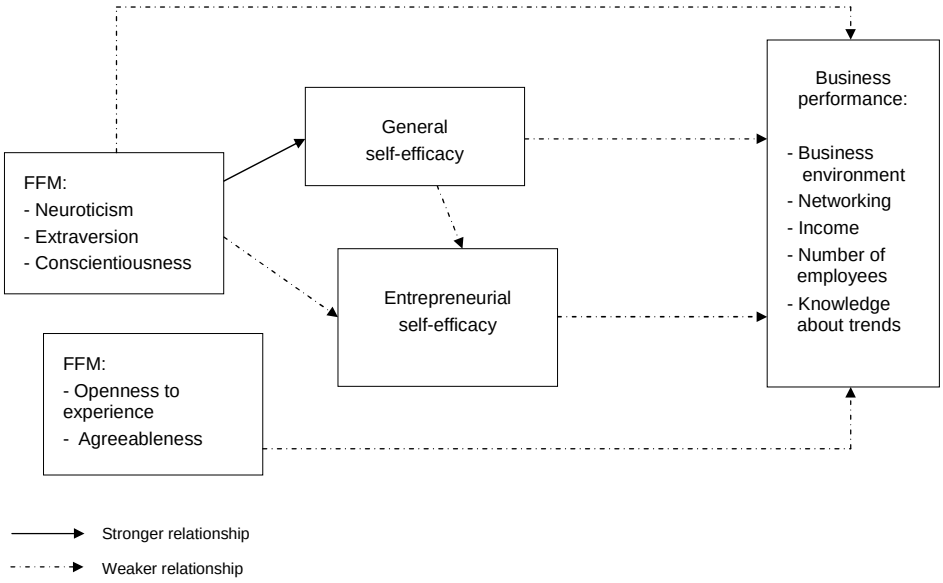


*Figure 1*. The schema of theoretical relationships between the investigated variables.

With reference to the results of previous research, we formulated the following hypotheses:

H 1. In comparison to the general population, nascent entrepreneurs are less neurotic and agreeable and more extravert, open to experience, and conscientious; they also have a higher level of generalized self-efficacy.

H 2. General and entrepreneurial self-efficacy will be positively related to conscientiousness and extraversion as well as negatively related to neuroticism. General self-efficacy will be more strongly related to these traits than entrepreneurial self-efficacy.

H 3. Neuroticism will be negatively related to business performance indicators.

H 4. Extraversion will be positively related to business performance indicators.

H 5. Openness to experience will be positively related to business performance indicators.

H 6. Conscientiousness will be positively related to business performance indicators.

H 7. General and entrepreneurial self-efficacy will be positively related to business performance indicators. Entrepreneurial self-efficacy will be more strongly related to these indicators than general self-efficacy.

H 8. The relationship between conscientiousness, neuroticism, and extraversion with business performance indicators will be mediated by entrepreneurial and general self-efficacy.

## METHOD

### Participants and Procedure

The study was a longitudinal research project with prospective measurements of personality traits. The sample consisted of participants in a program of entrepreneurship stimulation financed by the EU Human Capital Program; all of the participants planned to establish a new business in the domain of cultural and creative industries. The selected group of participants received training and business consulting and participated in a contest for a small grant to start a business. As a result of the selection of applicants and an interview with a business consultant, a group of 130 people were chosen, of whom 125 (including 75 women) completed inventories measuring personality traits (the FFM traits), general self-efficacy (GSE), and entrepreneurial self-efficacy (ESE) (T1). This phase took place before the training and starting new businesses. Three months later and after the business training phase, general (GSE) and entrepreneurial self-efficacy (ESE) were reassessed (T2). Then, 81 participants received financial support and started their small companies. After seven months (T3) and then after a further six months (T4) they completed a questionnaire describing the level of performance of their companies and their resources. We collected responses from 57 entrepreneurs in the first evaluation of the companies, and 77 entrepreneurs completed the questionnaires in the second evaluation. Comparisons between the entrepreneurs who responded to the survey at T3 and T4 and those who dropped out revealed no significant differences in terms of age, gender, and independent variables (FFM, GSE, and ESE).

The participants' age at the beginning of the program ranged from 23 to 61 years, with a mean age of 35.96 years (*SD* = 10.06). With the exception of two people, all of the participants had secondary or higher education, and all of the participants lived and worked in the Warsaw agglomeration.

## Measures

At T1, the participants completed the following questionnaires: the NEO Personality Inventory – Revised (NEO-PI-R; Costa & McCrea, 1988; Polish adaptation: Siuta, 2008), assessing neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness; the General Self-Efficacy Scale (GSES; Schwarzer & Jerusalem, 1993; Polish adaptation: Schwarzer, Jerusalem, & Juczynski, 1998 – as cited in Juczyński, 2009) assessing general self-efficacy; and the Entrepreneurial Self-Efficacy Scale (ESES), assessing entrepreneurial self-efficacy. The ESES is a self-report questionnaire measuring self-efficacy in entrepreneurial roles and tasks. It is a measure analogous to the one proposed by Chen and colleagues (1998). The ESES consists of 25 items rated on a 5-point scale. Preliminary analyses indicated the existence of a single factor. Cronbach's alpha was .95 at T1 and .97 at T2. One of the questions is "How confident do you feel when you plan the volume of sales?". At T2, we repeated assessment using GSES and ESES. Neuroticism, extraversion, openness to experience, agreeableness, and conscientiousness were treated as independent variables, while GSE and ESE were treated as independent variables and mediators.

The dependent variables were indices of business performance measured at T3 and T4 using a self-report survey developed for this study. We assessed the level of development of the company adapting the Skandia Navigator indicators (Edvinsson, 1997) and using the concept of entrepreneurial resources including such aspect of performance as the number of clients or number of business contacts and newly acquired contacts, which can be interpreted as potential for future development. Such an approach is considered the most valuable in the case of small and newly founded companies (Glinka & Gudkova, 2011).

The calculations presented in the Results section were conducted on the basis of five aggregate indicators of business performance:

– Business environment (the average number of customers and partnersindicated in response to open-ended questions);

– Networking (the average number of business contacts and newly acquired contactsindicated in response to open-ended questions);

– Income (income in the last quarter, given in response to an open-ended question);

– Number of employees (the total number of people working for the company, given in response to open-ended questions);

– Knowledge regarding trends (the sum of the answers to six questions regarding trends in legislation, economy, industry, customers, and technologies; the response scale consisted of five options; Cronbach's alpha was .75 at T3 and .96 at T4.

## STATISTICAL ANALYSES

The hypotheses were tested using correlation analyses, hierarchical regression analyses, and – for testing mediation – regression analyses conducted with PROCESS for SPSS 21 (Hayes, 2013). This procedure of analysis was as chosen due to the relatively small number of participants. Some of the business performance indicators (Business Environment, Networking, Income) were logarithmically transformed before the main analyses because of the deviation from normal distribution in the case of these variables (see Table 1). After transformation, the condition of normal or near-normal distribution was obtained.

Table 1
*Descriptive Statistics for Business Performance Indicators at T3 and T4 – Raw Scores Before the Removal of Outliers and Logarithmic Transformation*

| | Knowledge about trends | Business environment | Networking | Number of employees | Income (PLN) |
|---|---|---|---|---|---|
| | | | T3 | | |
| *M* (*SD*) | 22.45 (3.03) | 12.39 (10.90) | 16.64 (14.15) | 3.45 (2.14) | 6579 (9116) |
| Range | 16-30 | 2-47 | 3-57 | 0-9 | 1-35596 |
| Kurtosis | -0.50 | 2.13 | 1.68 | 0.50 | 0.65 |
| Skewness | 0.03 | 1.70 | 1.59 | 0.91 | 1.50 |
| | | | T4 | | |
| *M* (*SD*) | 22.82 (2.70) | 13.90 (13.31) | 99.69 (422.68) | 4.29 (4.46) | 20734 (58424) |
| Range | 18-29 | 0-65 | 2-3610 | 0-22 | 0-500000 |
| Kurtosis | -0.61 | 4.83 | 65.67 | 5.46 | 61.43 |
| Skewness | 0.02 | 2.125 | 7.90 | 2.30 | 7.50 |

*Note*. *M* – mean, *SD* – standard deviation.

## Results

To verify H1, we conducted a comparison to the samples from normalization studies. We found that the study sample was less neurotic, more extraverted, more open to experience, and more conscientious and had a higher general self--efficacy (see Table 2 and Table 3). The comparison revealed no significant differences in the agreeableness dimension. Such results are consistent with previous findings, including the conclusion stemming from meta-analyses (Rauch & Frese, 2007b; Zhao & Seibert, 2006; Zhao et al., 2010). The coefficients of correlation between both measures of self-efficacy and the FFM traits are also displayed in these tables. As hypothesized (H2), entrepreneurial and general self--efficacy are positively related to extraversion and conscientiousness and negatively related to neuroticism. Additionally, the study revealed their significant negative correlations with agreeableness.

Table 2
*Descriptive Statistics, Comparisons to Normalization Samples, and Intercorrelations for the FFM Personality Traits in the Study Sample (T1)*

| | NEU | EXT | OPN | AGR | CON |
|---|---|---|---|---|---|
| *M* (*SD*) | 70.26 (20.90) | 123.00 (18.67) | 136.14 (18.65) | 112.34 (18.65) | 134.93 (17.72) |
| Range | 20-129 | 71-172 | 83-180 | 50-159 | 91-174 |
| Comp. to normalization sample | | | | | |
| *M* (*SD*) | 95.4 (19.8) | 104.9 (19.0) | 104.0 (19.6) | 114.2 (16.6) | 114.8 (18.2) |
| *t* | -13.23** | 10.67** | 18.96** | -1.09 | 12.49** |
| NEU | 1.0 | -.29** | .11 | -.06 | -.45** |
| EXT | | 1.0 | .48** | .02 | .34** |
| OPN | | | 1.0 | .15 | .13 |
| AGR | | | | 1.0 | .08 |

*Note*. NEU – Neuroticism, EXT – Extraversion, OPN – Openness to experience, AGR – Agreeableness, CON – Conscientiousness, *M* – mean, *SD* – standard deviation; ** $p < .01$; * $p < .05$.

Table 3
*Descriptive Statistics, Comparisons to Normalization Samples, and Intercorrelations for General and Entrepreneurial Self-Efficacy (T1 & T2)*

| | GSE (T1) | GSE (T2) | ESE (T1) | ESE (T2) |
|---|---|---|---|---|
| *M* (*SD*) | 34.41 (3.12) | 35.47 (3.44) | 89.22 (10.82) | 99.46 (10.42) |
| Range | 25-40 | 29-40 | 63-120 | 77-125 |
| Comp. to normative sample | | | | |
| *M* (*SD*) | 27.32 (5.31) | 27.32 (5.31) | – | – |
| *t* | 25.11** | 24.52** | – | – |
| GSE (T1) | 1.0 | .60** | .53** | .52** |
| GSE (T2) | | 1.0 | .28** | .62** |
| ESE (T1) | | | 1.0 | .56** |
| NEU | -.43** | -.38** | -.51** | -.45** |
| EXT | .42** | .34** | .29** | .38** |
| OPN | .18* | .11 | -.07 | .12 |
| AGR | -.18* | -.22* | -.19* | -19* |
| CON | .42** | .39** | .33** | .34** |

*Note.* See Table 2. GSE – general self-efficacy, ESE – entrepreneurial self-efficacy; ** $p < .01$; * $p < .05$.

Table 4
*Coefficients of Correlation (Pearson's r) Between FFM Traits, Both Aspects of Self-Efficacy and Business Performance Indicatorsat T3 and T4*

| | Knowledge about trends | Business environment× | Networking× | Number of employees× | Income× |
|---|---|---|---|---|---|
| | | | T3 | | |
| NEU | -.19 | .15 | .19 | -.10 | .16 |
| EXT | .45** | .25# | .12 | -.05 | .09 |
| OPN | .14 | .21 | .09 | -.01 | -.03 |
| AGR | -.01 | -.15 | -.08 | -.10 | .38** |
| CON | .32* | .27# | -.03 | -.06 | .03 |
| GSE (T2) | .16 | .22 | .17 | -.09 | .08 |
| ESE (T2) | .35** | .25# | .19 | .10 | -.03 |
| | | | T4 | | |
| NEU | -.33** | .10 | .10 | -.05 | .19 |
| EXT | .25* | .04 | .12 | .22# | .21# |
| OPN | .11 | .29* | .21# | .21# | .17 |
| AGR | -.20 | .18 | .18 | .02 | .12 |
| CON | .09 | -.16 | .07 | .01 | .05 |
| GSE (T2) | .18 | -.17 | .05 | .14 | .03 |
| ESE (T2) | .44** | -.04 | .24# | .29* | -.03 |

*Note.* See Tables 2 and 3; ** $p < .01$; * $p < .05$; # $p < .10$; × the variables were logarithmically transformed before the analyses.

To test the remaining hypotheses (H3-H7), we performed an analysis of correlations between personality traits, self-efficacy, and business performance indicators (see Table 4). Seven months after starting a self-owned enterprise, extraversion, conscientiousness, and entrepreneurial self-efficacy were positively related to the declared knowledge of market trends and to the number of clients and business partners, whereas agreeableness was positively related to income (the opposite correlation could be expected). One year from the moment of starting a new business, the matrix of correlation coefficients changed as follows: neuroticism was related to a lower sense of knowledge regarding market trends whereas extraversion was correlated with a higher sense of knowledge regarding market trends, a higher number of employees, and a higher income; openness was related to experience with a higher number of clients and business partners, a higher number of business contacts, and a higher number of employees. At this point, entrepreneurial self-efficacy was related to better self-assessed knowledge regarding trends, more networking (business contacts), and a higher number of employees. No correlation between general self-efficacy and the indices of business performance was statistically significant. The methodological weakness was the changing number of participants who responded to the survey; one year after starting a self-owned business (T4), almost all of the entrepreneurs took part in the survey, whereas at T3 only 70% of the participants in the project completed the questionnaire on business performance.

Hypotheses from H3 to H7 were also tested using hierarchical regression models. Table 5 shows the results of the three-step hierarchical linear regression analysis. In the first step, gender was introduced into the model, and then all of the five personality traits were introduced; in the last step, we introduced both aspects of self-efficacy (in each step, the Enter method was used). The coefficients of the semipartial correlations between the successive predictors and dependent variables are presented in Table 5.

As regards the participants'gender, only income was found to be dependent on this characteristic. Women earned less than men. The FFM personality traits and the sense of self-efficacy were predictors of business performance in the following cases:

– Knowledge regarding economic trends was higher when entrepreneurs were more extraverted (at T3) and less neurotic (at T4), and when they had a greater sense of domain-specific self-efficacy (at T3 and T4).

– Business environment was larger when entrepreneurs were more neurotic (at T3) and more open to experience (at T4).

– The number of business contacts was higher when entrepreneurial self--efficacy was higher.

– Income was higher in the case of men, when neuroticism and agreeableness were higher (at T3), or when neuroticism and extraversion were greater (at T4).

The explained variance reached 45% in the case of income measured at T3; the explained variance in the remaining regression analyses ranged from 22% (networking at T4) to 31% (knowledge regarding trends at T4).

Table 5
$R^2$, $\Delta R^2$, *F, and Coefficients of Semi-Partial Correlation Between Predictors and Business Performance Indicators at T3 and T4 (Only Significant Values From the Last Step Are Shown in the Table)*

| | Knowledge about trends× | Business environment× | Networking× | Number of employees× | Income× |
|---|---|---|---|---|---|
| | | | T3 | | |
| $R^2$ | .01 | .01 | | | .13 |
| $\Delta R^2_{1,2}$ | .24 | .24 | | | .29 |
| $\Delta R^2_{2,3}$ | .05 | .04 | | | .03 |
| *F* | 2.25* | 1.78# | *n.s.* | *n.s.* | 3.72** |
| sex | | | | | .40** |
| NEU | | .35* | | | .30* |
| EXT | .28* | | | | |
| AGR | | | | | .44** |
| ESE (T2) | .22# | | | | |
| | | | T4 | | |
| $R^2$ | .01 | .01 | .01 | | .05 |
| $\Delta R^2_{1,2}$ | .19 | .21 | .09 | | .20 |
| $\Delta R^2_{2,3}$ | .11 | .03 | .12 | | .01 |
| *F* | 3.06** | 2.46* | 1.79# | *n.s.* | 2.62* |
| sex | | | | | .34** |
| NEU | -.19# | | | | .27* |
| EXT | | | | | .22* |
| OPN | | .37** | | | |
| GSE (T2) | -.19# | | | | |
| ESE (T2) | .33** | | .35** | | |

*Note*. See Tables 2 and 3; ** $p < .01$; * $p < .05$; # $p < .10$; *n.s.* – not significant.

Using the Process program developed by Hayes, we performed a mediation analysis based on the regression analysis (Model 4) in order to test H8. We found four significant analyses at T2 in which entrepreneurial self-efficacy was a predictor (cf. Table 6). The predictions of the number of employees by extra-

version were mediated by entrepreneurial self-efficacy (the confidence interval of the indirect effect did not include zero; the Goodman test $z(73) = 1.73$, $p < .08$). Knowledge regarding market trends was predicted by neuroticism, extraversion, and agreeableness – via entrepreneurial self-efficacy in each case (the confidence interval of the indirect effect didnot include zero; the Goodman test: $z(69) = 2.39$, $p < .02$; $z(69) = 2.33$, $p < .02$; and $z(69) = 1.66$, $p < .10$, respectively).

Table 6
*Model Coefficients for the Mediating Role of Entrepreneurial Self-Efficacy*

| Antecedent | Consequent | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | *M* (ESE – T2) | | | | *Y* (Number of employees – T4) | | | |
| | | Coeff. | *SE* | *p* | | Coeff. | *SE* | *p* |
| *X* (EXT)<br>*M* (ESE – T2) | *a* | .19 | .06 | < .01 | *c`* | .01 | .01 | .19 |
| | | | | | *b* | .02 | .01 | < .05 |
| | $i_1$ | 77.45 | 7.88 | < .001 | $i_2$ | -.96 | .82 | .24 |
| | | $R^2 = .11$ | | | | $R^2 = .11$ | | |
| | | $F(1, 71) = 9.03$, $p < .01$ | | | | $F(2, 70) = 4.24$, $p < .05$ | | |
| | *M* (ESE – T2) | | | | *Y* (Knowledge about trends – T4) | | | |
| | | Coeff. | *SE* | *p* | | Coeff. | *SE* | *p* |
| *X* (NEU)<br>*M* (ESE – T2) | a | -.27 | .07 | <.001 | *c`* | -.03 | .02 | .16 |
| | | | | | *b* | .09 | .03 | <.01 |
| | $i_1$ | 119.22 | 4.75 | <.001 | $i_2$ | 15.71 | 3.86 | < .001 |
| | | $R^2 = .19$ | | | | $R^2 = .21$ | | |
| | | $F(1, 67) = 15.38$, $p < .001$ | | | | $F(2, 66) = 8.66$, $p < .001$ | | |
| | *M* (ESE – T2) | | | | *Y* (Knowledge about trends – T4) | | | |
| | | Coeff. | *SE* | *p* | | Coeff. | *SE* | *p* |
| *X* (EXT)<br>*M* (ESE – T2) | a | .19 | .06 | < .01 | *c`* | .01 | .01 | .47 |
| | | | | | *b* | .10 | .03 | < .001 |
| | $i_1$ | 77.45 | 7.79 | < .001 | $i_2$ | 11.28 | 3.01 | < .001 |
| | | $R^2 = .13$ | | | | $R^2 = .19$ | | |
| | | $F(1, 67) = 9.47$, $p < .01$ | | | | $F(2, 66) = 7.75$, $p < .001$ | | |
| | *M* (ESE – T2) | | | | *Y* (Knowledge about trends – T4) | | | |
| | | Coeff. | *SE* | *p* | | Coeff. | *SE* | *p* |
| *X* (AGR)<br>*M* (ESE – T2) | a | -.13 | .07 | < .08 | *c`* | -.02 | .02 | .27 |
| | | | | | *b* | .10 | .03 | <.001 |
| | $i_1$ | 115.97 | 8.35 | < .001 | $i_2$ | 14.88 | 3.84 | <.001 |
| | | $R^2 = .05$ | | | | $R^2 = .20$ | | |
| | | $F(1, 67) = 3.23$, $p < .08$ | | | | $F(1, 66) = 8.20$, $p < .001$ | | |

*Note.* See Tables 1 and 2.

None of the analyses in which general self-efficacy was a mediator was statistically significant. Except for openness to experience, general self-efficacy mediated the relationships between the FFM traits and entrepreneurial self--efficacy[1].

We also performed analyses of the facets of FFM traits. Although the general level of conscientiousness wasnot related to business performance, the analysis of correlations between the overall indicator of business performance and the six facets of conscientiousness showed that striving for achievement was positively related to business performance (summed standardized set of indicators) measured at T3 ($r(55) = .33$, $p < .01$) and that Deliberation was negatively related to business performance measured at T4 ($r(76) = -.23$, $p < .05$). The analysis of the facets of extraversion showed that the summary indicator of business performance correlated with Activity in both measurements ($r(55) = .42$, $p < .01$ at T3 and $r(76) = .32$, $p < .01$at T4, respectively) and with Assertiveness ($r(55) = .29$; $p < .03$) and Excitement-Seeking ($r(55) = .29$; $p < .03$) at T3.

## DISCUSSION

Hypothesis 1 was confirmed – the prospective study revealed that, as expected, before they start they own business, nascent entrepreneurs differ from the general population in terms of all the FFM traits except agreeableness. Also the second hypothesis, regarding the relationships between FFM traits and self--efficacy measures, received confirmation.

The hypotheses regarding the relationships between the FFM traits and the indicators of business performance (H 3-H 6) received only partial support. Depending on the indicator, some traits are related to business performance. In general, of all the Big Five traits, extraversion (H 4) and neuroticism (H 3) appear to be the most significant predictors of business performance; however, the latter trait is related negatively to knowledge about trends (which was expected) and positively to income and to a higher number of clients and business partners (which is contrary to the hypothesis). Openness to experience predicts only a greater number of clients and business partners (H 5), while conscientiousness (H 6) does not predict any indicators of business performance.

The unexpected set of predictors of the income level could be at least partially explained by the imperfection of the method used for measuring these indica-

[1] Detailed results of the analyses are available from the authors.

tors. The entrepreneurs described themselves by self-reporting, and their self--descriptions did not influence their treatment in the financial support program. However, they may have been motivated to understate their average income and may not have answered with complete honesty. In the case of the other indicators of business performance, self-ratings are probably more reliable estimations and were treated by participants as less sensitive information. If this result is accurate, more neurotic and more agreeable beginners are generally more honest in describing their average income level.

The marginal role of conscientiousness appears to be confusing because the importance of this trait has extensive theoretical justification and has been supported in previous research. This result of our research might reflect the weaknesses of the study sample (small in size, homogeneous, and receiving support in the process of business startup); however, the result might reflect the complex nature of the trait of conscientiousness. In their meta-analysis, Zhao and Seibert (2006) distinguished two subdimensions of conscientiousness – the need for achievement and dependability – and showed that only the former differentiates between entrepreneurs and managers. Our findings are consistent with this expectation: striving for achievement is positively and deliberation negatively related to business performance indicators.

The results of the study indicate the relatively important role of extraversion, the trait that we believe to be a little underestimated in previous research. The analysis of the facets of extraversion shows that the need for stimulation as an aspect of temperament should be treated as a promising predictor of entrepreneurial behaviors.

As expected (H 7), the domain-specific aspect of self-efficacy was found to be a far better predictor of business performance than general self-efficacy. Such results proved the presumptions formulated by Bandura (2012). In accordance with Bandura's theory, entrepreneurial self-efficacy measured after the training phase and after preparing the idea of one's own business is more strongly related to business performance than to entrepreneurial self-efficacy, which was measured at the beginning of the program when the participants had little entrepreneurial experience and limited knowledge of the problems faced when running a business. Entrepreneurial self-efficacy appears to be a substantial predictor of entrepreneurial behavior and achievement in business.

Hypothesis 8 concerning the mediating effect of self-efficacy on the relationship between business performance and FFM traits, received only partial support. However, a few weak mediating effects were established in the analysis. An important weakness of the study is the small number of participants, which caused

difficulties in testing the mediator hypotheses by means of more sophisticated analyses such as structural modeling methods. FFM traits and domain-specific self-efficacy appear to play a substantial role in predicting entrepreneurial performance, and, although they were correlated with each other, at least a partial mediation effect was observed; it appears that both aspects of individual characteristics are important and require further empirical investigation. However, other potential mediators should be tested in future research. For instance, the type of motivation in entrepreneurs seems to be a promising variable (cf. Kaczmarek, 2014).

## CONCLUSIONS

Most hypotheses regarding the predictive value of the FFM traits and self-efficacy received only partial support. The main weakness lies in the studied sample, which is small in size, markedly homogeneous (representing only cultural and creative industries), and supported externally in the process of business startup, which is relatively untypical in the general population of entrepreneurs and may have interfered with the findings. Another limitation of the presented findings is that business performance was measured in the earliest phase of starting a new business. Therefore, conclusions are limited to start-up companies, and the relationship between personality and performance in the case of more experienced entrepreneurs could be different. However, studying the early phase of business activity is also important, and prospective longitudinal research is the most valuable design for testing the causal relationship between personality and performance. The repeated measurement of performance showed how dynamic the relationships between personality and action is, which invites a critical look at the conclusions based on the results of meta-analyses.

## REFERENCES

Bandura, A. (2012). On the functional properties of perceived self-efficacy revisited. *Journal of Management, 38*(1), 9-44.

Brandstätter, H. (2011). Personality aspects of entrepreneurship: A look at five meta-analyses. *Personality and Individual Differences, 51*(3), 222-230.

Chen, C. C., Greene, P. G., & Crick, A. (1998). Does entrepreneurial self-efficacy distinguish entrepreneurs from managers? *Journal of Business Venturing, 13*(4), 295-316.

Ciavarella, M. A., Buchholtz, A. K., Riordan, Ch. M., Gatewood, R. D., & Stokes, G. S. (2004). The Big Five and venture survival: Is there a linkage? *Journal of Business Venturing, 19*(4), 465-483.

Costa, P. T., & McCrae, R. R. (1988). *NEO-PI/FFI. Manual supplement for use with the NEO Personality Inventory and the NEO Five-Factor Inventory.* Odessa, Florida: Psychological Assessment Resources, Inc.

Costa, P. T., & McCrae, R. R. (2001). A theoretical context for adult temperament. In T. D. Wachs & G. A. Kohnstamm (Eds.), *Temperament in context* (pp. 1-21). USA, London: Lawrence Erlbaum Associates, Publishers.

Dollinger, M. J. (2002). *Entrepreneurship: Strategies and resources*. Upper Saddle River: Prentice Hall.

Edvinsson, L. (1997). Developing intellectual capital at Skandia. *Long Range Planning, 30*(3), 366-373.

Glinka, B., & Gudkova, S. (2011). *Przedsiębiorczość*. Warsaw, PL: Wolters Kluwer Polska.

Hayes, A. F. (2013). *Introduction to mediation, moderation and conditional process analysis*. New York, London: Guilford Press.

Juczyński, Z. (2009). *Narzędzia pomiaru w promocji i psychologii zdrowia* (2nd ed.). Warsaw, PL: Psychological Test Laboratory of the Polish Psychological Association.

Judge, T. A., Jackson, Ch. L., Shaw, J. C., Scott, B. A., & Rich, B. L. (2007). Self-efficacy and work-related performance: The integral role of individual differences. *Journal of Applied Psychology, 92*(1), 107-127.

Kaczmarek, M. (2014). Cechy osobowości jako predykatory motywacji i działań przedsiębiorcy. *Problemy Zarządzania, 12*(1), 175-190.

Łaguna, M. (2010). *Przekonania na własny temat a aktywność celowa. Badania nad przedsiębiorczością*. Gdańsk: Gdańskie Wydawnictwo Psychologiczne.

Rauch, A., & Frese, M. (2007a). Born to be an entrepreneur? Revisiting the personality approach to entrepreneurship. In J. R. Baum, M. Frese, & R. A. Baron (Eds.), *The psychology of entrepreneurship* (pp. 41-66). New York–London: Psychology Press Taylor & Francis Group.

Rauch, A., & Frese, M. (2007b). Let's put the person back into entrepreneurship research: A meta-analysis on the relationship between business owners' personality traits, business creation, and success. *European Journal of Work and Organizational Psychology, 16*(4), 353-385.

Siuta, J. (2006). *Inwentarz Osobowości NEO-PI-R Paula T. Costy Jr. i Roberta R. McCrae. Adaptacja polska. Podręcznik.* Warsaw, PL: Psychological Test Laboratory of the Polish Psychological Association.

Stajkovic, A. D., & Luthans, F. (1998). Self-efficacy and work-related performance: A meta-analysis. *Psychological Bulletin, 124*(2), 240-261.

Tyszka, T., Cieslik, J., Domurat, A., & Macko, A. (2011). Motivation, self-efficacy, and risk attitudes among entrepreneurs during transition to a market economy. *The Journal of Social-Economics, 40*(2), 124-131.

Zhao, H., & Seibert, S. E. (2006). The Big Five personality dimensions and entrepreneurial status: A meta-analytic review. *Journal of Applied Psychology, 91*(2), 259-271.

Zhao, H., Seibert, S. E., & Lumpkin, G. T. (2010). The relationship of personality to entrepreneurial intentions and performance: A meta-analytic review. *Journal of Management, 36*(2), 381-404.

The preparation of the English version of *Roczniki Psychologiczne* (*Annals of Psychology*) and its publication in electronic databases was financed under contract no. 723/P-DUN/2016 from the resources of the Minister of Science and Higher Education for the popularization of science.