energies

MDPI

Article

The Trait of Extraversion as an Energy-Based Determinant of Entrepreneur's Success—The Case of Poland

Andrzej Janowski [1] and Anna Szczepańska-Przekota [2,*]

[1] Department of Economy, Higher School of Business and Management, Płońska 57A, 06-400 Ciechanów, Poland; andrzej.j@poczta.fm
[2] Faculty of Economic Science, Koszalin University of Technology, Kwiatkowskiego 6E, 75-343 Koszalin, Poland
* Correspondence: anna.szczepanska-przekota@tu.koszalin.pl

Abstract: The fact that personality traits play an important role when it comes to predicting people's entrepreneurial behavior is currently indisputable. However, so far, the majority of subject literature has focused on employee characteristics in developed countries. To address this gap, research was conducted, including 188 entrepreneurs of small and medium enterprises (SME) and 21 highest-level employees in Poland—one of the countries with the most hostile and turbulent environment for entrepreneurial operations in the world. The five personality traits (Big Five) were evaluated using the 60-item scale. There were three objectives of this study: to identify the differences between entrepreneurs and the most effective, highest-level employees, in the context of personality trait intensities, to determine the level of specific trait(s) intensities (OCEAN) of an effective entrepreneur. Finally, to determine whether it is possible to construct a model based on BIG5 to estimate the probability of success as an entrepreneur. The research results imply there are significant differences between successful entrepreneurs and highly effective employees and their personality trait intensities, described in the BIG5 model. Moreover, it is possible to distinguish trait intensity ranges, determining the success as an entrepreneur. Finally, we constructed the empirically based model, which allows us to estimate the chances of an individual succeeding as an entrepreneur with only a 5% error rate. The main factor and common denominator of entrepreneurial effectiveness is the trait of extraversion. The findings of our study are particularly important for the renewable energy sector in Poland, as the last part of green energy implementing blockchain (e.g., the installation and maintenance of wind turbines and solar panels) is being undertaken, in vast majority, by independent contractors and SME owners (entrepreneurs).

Keywords: personality; success; Big Five modelc; trait; entrepreneur

Citation: Janowski, A.; Szczepańska-Przekota, A. The Trait of Extraversion as an Energy-Based Determinant of Entrepreneur's Success—The Case of Poland. *Energies* **2022**, *15*, 4533. https://doi.org/10.3390/en15134533

Academic Editors: David Borge-Diez and Štefan Bojnec

Received: 3 May 2022
Accepted: 20 June 2022
Published: 22 June 2022

1. Introduction

The complexity of the issues related to entrepreneurial activity is reflected in the discourse in the world of economic sciences that has been going on for over 200 years. Nowadays, the development of organizational management culture is more and more extensive. After quality, environment, information and security management, an interesting area is the energy management of entrepreneurs' personalities. Energy is an ambiguous term. It is usually associated with physics, but it is also present in finance and psychology. Its importance is emphasized in: energy and financial markets, pricing mechanisms, energy corporate finance, green finance and investment, energy derivative markets and energy risk management [1]. This approach makes it possible to treat money as a source of energy [2], which relates to a number of processes in economic entities and affects the overall financial condition of enterprises [3,4]. According to the mentioned dissonance we introduce the energy in the primal context. Aristotle, and other Ancient Greece Philosophers, understood the (human) personality as a potential (see concept of "the energy of God.", and the energy of the mind, as the "essence of life") [5]. Moreover, in contemporary world of science,

the Greek term of ενέργεια is frequently translated wrongly as "energy". The original meaning of this term was "a resource at the expenditure of which it is possible to perform work". This statement is also reflected and confirmed in works of von Mises [6] and other protagonists of the Austrian Economic School. As a consequence, the energy in organization management is human capital, as a key link in this system. Entrepreneurs, together with a set of individual personality traits, are the energy determinant in the functioning and development of an enterprise. In this context, it is worth measuring and assessing the level of influence of the personality factor, which is largely responsible for the professional success of the entrepreneur. In the twentieth century, another approach was included in the discussion—focused on personality, the dynamics of which particularly intensified at the beginning of the twenty-first century.

The first scientific descriptions of the aforementioned phenomenon can be found in the works of Cantillon [7,8] or [9], now perceived as precursors of the description of the nature of entrepreneurship and the characteristics of people who run this type of economic activity. The scientific foundations laid by the above authors are still highly valued in the academic reality of the 21st century. According to Carpini et al. [10], three currents of perception of entrepreneurship prevail:

- Through the prism of labor economy and the phenomena accompanying taking up a specific type of employment (I);
- Microeconomic theories of innovation (II);
- Macroeconomic theories of innovation, growth and economic cycles (III).

Of the above, the first (I), characterized by an extensive approach in terms of scope and scale, is the heritage of the Austrian School of Economics, focusing on the individual effectiveness of the human being [9]. The approaches mentioned do not exhaust all possibilities; however, they try to find an answer to the question based on economic premises, who and for what reasons does someone become an entrepreneur and thus Cantillon perceives the entrepreneur as an arbitrary or speculative entity that, by purchasing goods at a fixed price, takes the risk of an uncertain price of selling the purchased good. According to the author, effective entrepreneurs play a key role in the economy as a result of their absorption of the potential impasse (cost/outcome ratio) and, consequently, enabling the production and exchange of products under the conditions of market equilibrium. In turn, ineffective players are eliminated by market mechanisms. Thus, only those who are able to adapt (who are flexible enough) to the changing conditions of the organizational environment will survive in the market in the long run. They also need to be reactive with new players entering the market. Thus, according to Chantillon, the entrepreneur is not an innovator nor are they able to influence the value of the flow of the supply/demand stream. However, they are characterized by an above-average level of intelligence, perception, readiness and specific energy to take risks. Their main task is to coordinate (merge) two opposing sides of the market—sellers and recipient—along with the retention of the entire risk accompanying the said process. The above concept was reflected almost 200 years later by Von Mises [6], Von Hayek [11] and Kirzner [12] and is focused on the individual potential of an entity in the context of its effectiveness. The problem of the aforementioned potential, although perceived from a more universal (not limited to strictly economic dimension) perspective, was also revealed in the research of clinicians focused on exploring the energy of the personality.

Personality describes unique psychological characteristics that influence an individual's behavior, thoughts and feelings in different situations and times [13,14]. To understand the construct of personality as an energy conditioning enterprise development, researchers have proposed multiple personality frameworks that have varying levels of credibility and validity. Examples of personality frameworks include HEXACO [15], Myers-Briggs Type Indicator [16] and 16 personality factors [17]. However, the dominant personality structure is the Big Five [18,19], which is based on the lexical hypothesis. Under this hypothesis, socially relevant and important descriptions that are often used to describe individuals and distinguish one from another are preserved in our natural language (see Saucier and

Goldberg 1996 review). Allport [20] and Catell [21] investigated these descriptors as a basis for the creation of a scientific taxonomy of personality traits, which led to the repeated findings that there are five domains underlying personality: openness (creativity, curiosity, culture), conscientiousness (organization, accountability, honesty), extraversion (sociability, assertiveness, energy), agreeableness (kindness, cooperation, trust) and emotional stability (peace, security, lack of emotions).

Thus, the five-factor model is the only one derived from empirical questionnaire analyses. Costa Jr and McCrae [22] performed a cluster analysis of 16 personality factors—16PF [16], initially creating three domains: neuroticism, extraversion and openness. Later, agreeableness and conscientiousness were added to them, creating five factors [23], which ultimately made the model universal [24] and established it as a scientific paradigm more than a decade ago [19] (Table 1).

Table 1. The main postulates of five factor theory.

1. Basic tendencies a. Individuality. All adults can be characterized by their position in relation to the set of personality traits that influence patterns of thinking, feeling and behavior. b. Origin. Personality traits are endogenous basic tendencies. c. Development. Traits develop through childhood and mature into adulthood (30 years of age); thereafter, they are stable in people without cognitive impairment. d. Structure. Traits are organized in a hierarchical manner, from narrow and specific dispositions to broad and general ones: neuroticism, extroversion, openness to experience, agreeableness and conscientiousness are at the highest level of this hierarchy.
2. Characteristic adaptations a. Adaptation. Over time, individuals respond to their environment by forging patterns of thinking, feeling and behavior that align with personality traits and previous adaptations b. Maladaptation. At any point in time, adjustments may not be optimal for cultural values or personal goals. c. Flexibility. Characteristic adaptations change over time in response to biological maturation, changes in the environment or intentional interventions.
3. Objective biography a. Multiple determination. Action and experience are at all times complex functions of all the characteristic adaptations determined with the environment. b. Course of life. Individuals have plans, schedules and goals that enable the activity to be organized over extended periods of time in a manner compatible with their personality traits.
4. Self-image a. Schemes "I". Individuals maintain a cognitive-affective view of themselves, that is available to consciousness. b. Selective perception. Information is selectively represented in the self-image so that it is consistent with the personality traits and gives the person a sense of consistency.
5. External influences a. Interaction. The social and physical environment interacts with the dispositions of the personality to shape characteristic adaptations and interacts with characteristic adaptations to regulate the course of behavior. b. Perception. People perceive the environment and construct it in a way that is compatible with their personality traits. c. Reciprocity. People selectively act on the environment to which they respond.
6. Dynamic processes a. Universal dynamics. A person's continual activity toward the creation of adaptations expressed in thoughts, feelings and behaviors is governed to some extent by universal cognitive, affective and volitional mechanisms. b. Differential dynamics. Some dynamic processes are differentially influenced by an individual's underlying tendencies (including personality traits).

Source: [25].

The fundamental postulate of FFT implies the existence of traits as endogenous, underlying tendencies. FFT does not recognize any influence of the environment on personality traits [26]. The starting point for this position is personality stability. Assuming that traits are modified by the environment, one should expect significant changes in their scope over time; however, the authors observed an (statistically) insignificant change, ergo, it is not proven that personality traits are related to the impact of the external environment.

According to this model, personality can be reduced to the five basic traits (tendencies) mentioned above (stability) and the behaviors of human beings determined by them [27], and thus:

- Extroverts draw energy from social interactions and are seen as outgoing and friendly [24].
- Agreeable individuals tend to be caring, emotionally supportive, trusting and good-natured [28,29].
- Conscientiousness is characterized by a tendency to be punctual, well-organized, diligent and thorough [30].
- Neuroticism, or low emotional stability, refers to the tendency to experience negative emotions and the behaviors that accompany them [24]. Highly neurotic individuals tend to be stressed, anxious, impulsive and vulnerable [31], and as a result exhibit ineffective coping strategies and poor emotional adjustment strategies [24,32].
- Openness to experience, or what is also known as intellect, culture or creativity [33], refers to the tendency to be aesthetically sensitive, creative, open and cultured. Such people wish to discover new things, have broad interests and imaginations and show extraordinary thought processes [24].

The five-factor conceptualization of personality is thus generalized based on measurements, cultures and sources of judgment [34], in part because personality traits are influenced by genetic factors [35] and early life experiences [36]. Importantly, they are relatively stable over time, especially after an individual reaches the age of 30, when the hormonal balance of the human body stabilizes [13]. The above determinants in the context of compliance are also characteristic of behaviorists in the area of defining performance, in particular understood as behavior or a directly observed action, related to important goals, controlled at least partially by the individual and used to rank people in terms of proficiency [8,37–39]. Performance results cover a wide range of cognitive, motor, psychomotor or interpersonal effects obtained [40]. Given the significant emphasis on observable achievement, the prediction of outcomes is considered the "holy grail" of several disciplines [41], although some researchers have focused on contextual variables that may affect performance, such as the threat of stereotyping [42], practice [43], homework [44] and ego exhaustion [45]. Alternatively, other academics have sought to identify individual differential variables that may be associated with outcomes, such as age [46], gender [47] and socioeconomic status [48]. Therefore, the problem of personality permeates all areas of organizational activity where human resources are involved as a specific type of individual energy in the enterprise. Particularly important for this category are the professional choices of individuals [49], work styles [50], the level of commitment [51] and the ability of individuals to react and interact with others [52]. Oldham et al. [53] have recently come to a consensus that workers react differently to job characteristics as a function of their underlying personality traits. Studies on personality also show that personality can influence work attitudes [54], experienced levels of job fit [55] and, most importantly, work performance [56]. As a concept, labor productivity therefore refers to activities or behaviors in which individuals engage at work that contribute to the overall functioning of the organization [57]. Rothman and Cooper [58] define work efficiency as the initiative and resourcefulness that employees show in fulfilling their tasks and solving work-related problems, as well as the efficiency with which they fulfill these duties. The accumulation of research results over the years has led to a general consensus that work performance is a multidimensional construct, consisting of two distinct groups of behaviors, each of which independently contributes to overall work performance, both task-related and contextual [59–61]. Different conceptualizations of work results therefore take into account how individuals contribute to the achievement of the organization's goals, helping it to achieve them.

Taking into account the above conditions, a decision was made to empirically verify the correctness of the assumptions of the Big Five model in the context of the individual's effectiveness as an entrepreneur. The authors synergize the clinical achievements of behaviorists, represented by Costa et al. [24], embodied in the Big Five model, and promoters of

the concept of effectiveness, perceived through the prism of the assumptions of the Austrian School of Economics [6]. Additionally, empirical verification of the effects of the mentioned synergy is made, which is a bridge connecting the achievements of world science with organizational practice and a contribution to the science of economics and management. It is the first work in Europe which analyzes the characteristics of entrepreneurs who built their organizations from scratch, in the conditions of economic transformation from a socialist to a capitalist system (including accession to the European Union). As a consequence, this paper aims to determine the knowledge gaps related to the application of a theoretical perspective, to research directions and to the content of Big-Five-based studies. The authors focus on job creators and founders of SMES, contrary to the previously published papers which took into consideration employees only (of different organizational levels). The research results and conclusions provide foundations for a discussion of significant ideas for future research. Subsequently, three main research hypotheses are established to achieve the research aim.

Occupational effectiveness researchers proved that an individual's personality determines many of the work-related behaviors and outcomes that are significant for both owners and top management in organization. The existence of a cause-and-effect relationship was noticed, e.g., between personality traits and unproductive behavior, turnover, absenteeism, tardiness, civic attitudes, group success, job satisfaction, safety and work efficiency [62]. Accordingly, we predict the following:

H1. *There are differences in the levels of intensity of the Big Five traits between entrepreneurs and top management in organizations*.

What is also significant is that all the economic phenomena very rarely have linear characteristics. Referring to Yerkes–Dodson Law [63–65], there is a range of every psychological factor, beyond which, the level of human effectiveness decreases. Thus, we hypothesize the following:

H2. *There is a set of trait intensities that characterize an effective entrepreneur*.

On the basis of the groundbreaking work of Kahneman and Tversky [66], it is justified to claim that entrepreneurial decisions are undertaken in dynamic, unpredictable and risky environment. Hence, to increase the level of entrepreneurial success (decreasing the probability of failure) the modeling should be implemented [67–69]. This statement is reflected in

H3. *It is possible to predict the professional success (model) of an individual as an entrepreneur*.

The structure of the article is described as follows. The subsequent section presents the methodological approach implemented, which is then followed by an analysis of the aggregated data (in order to verify hypotheses). Then, the research gaps are identified. After that, a critical discourse is carried out, aiming to address the results and provide suggestions for future scientific research. Finally, the last part offers conclusions.

2. Materials and Methods

The sector of small and medium-sized enterprises in Poland, as well as in other highly developed countries, plays a fundamental role in the economy. It can be concluded that it is the bloodstream of the economy because it is an important source of state budget revenues, participates in the creation of gross domestic product, creates new jobs and influences the innovativeness of the economy. This sector is very diverse in terms of the size of enterprises and the subject of activity. Micro, small and medium-sized enterprises constitute the vast majority in Poland—almost 99.8%. Among them, the most numerous group (96.7%; 2.08 million) are micro-enterprises and the share of small enterprises is 2.4% (52.7 thousand), while medium-sized enterprises only equal 0.7% (15.2 thousand) and large ones equal about 0.2% (3.7 thousand). The analysis of the industry structure of micro, small and medium-sized enterprises shows that the largest group are companies from the services sector

(52.1%), followed by trade (23.6%) and construction (14.1%). Every tenth enterprise from the SME category (10.3%) operates in the industry sector. The share of small and medium-sized enterprises in the creation of the gross domestic product (GDP). It is estimated that micro, small and medium-sized enterprises generate almost half of the GDP (49.8%). Micro-enterprises have the largest share in gross domestic product—30.2%. In the case of SMEs, the service sector plays the most important role—43.1%. Then, trade plays 26.5%, industry plays 19.0% and construction plays 11.3% [70]. In the report "Global Business Complexity Index 2021" [71], experts compared the main requirements of individual countries in 77 jurisdictions around the world in the field of administrative regulations and ensuring compliance with legal regulations faced by entrepreneurs planning to run their business in a selected market. Poland is in the group of countries where the conditions for running a business are among the most difficult. Ergo, self-employed entrepreneurs are among the most determined people; therefore, we decided to conduct the research in this professional group.

The inductive method was implemented in the research because this tool is particularly useful and adequate when the conceptual base cannot determine identifiable dimensions in a simple manner [72]. It requires an expert approach to the analysis of the sample content, is based on a post hoc factor analysis [73,74] and also asserts a correct categorization of factors [75]. Additionally, a comparative analysis of the subject literature increased the level of research result validation [76]. The case study was constructed through the use of an iteration process, which was based on a consonance of theoretical assumptions and empirical evidence [77,78]. The implementation of a case study in the context of theory development enhances inductive research through the creation of an adequate theory that creates scientific progress and is testable [79]. The purpose of the study was to identify whether the personality trait intensities of effective entrepreneurs and differences between them and top management employees exist.

The research was conducted in the period from 1 February 2021 to 30 October 2021. In-depth interviews and tests were carried out by the authors with the participants directly, which made it possible to ensure the highest standards of reliability of the results obtained. To evaluate personality trait intensities (the key determinant of the study), the standardized 60-item questionnaire of Costa and McCrae's BIG5 model was implemented (Appendix A) and the scores were estimated with the application, received together with the test. The content of the second (complementary) entrepreneur's questionnaire (Appendix B) was established as a result of using the Delphi method of combined efforts by academics from two economic and management departments: the Bydgoszcz University of Technology and Life Sciences and the Koszalin University of Technology. This part of the research was focused on increasing the research sample's representativeness level. We examined 12 individuals (who agreed for the interview first), the company data were obtained from Polish Bureau of Statistics from each of the 16 districts in Poland. In total, 4 questionnaires (Appendix B) were rejected, as they did not match the value $q_1 - q_2 = q_3$. All the calculations and their results were provided with Statistica 10.0. Finally, the research sample consisted of 188 entrepreneurs (21 women and 157 men) who met strictly defined conditions:

1. Age over 30 (the basic assumption in the Big Five model—the need to stabilize the hormonal balance of the human body).
2. Self-employment (entrepreneur).
3. Uninterrupted period of running one's own business for a minimum of 20 years (this parameter is particularly important because the period of the last 20 years has been accompanied by structural changes in running a business: transformation of the socialist economy into a free market economy and accession to the European Union)
4. Building an organization from scratch.

The sample size was determined on the basis of the confidence interval for the population proportion:

$$P\left(p - z_{\frac{\alpha}{2}}\sqrt{\frac{p(1-p)}{n}} < \pi < p + z_{\frac{\alpha}{2}}\sqrt{\frac{p(1-p)}{n}}\right) = 1 - \alpha$$

where:

π—unknown population proportion;

p—population proportion in a sample study;

n—sample size;

$1 - \alpha$—confidence coefficient, probability that the interval will cover an unknown population proportion;

$z_{\frac{\alpha}{2}}$—quantile of the N(0; 1) distribution.

Assuming that the admissible estimation error of the population proportion is not to exceed the set value of d:

$$z_{\frac{\alpha}{2}}\sqrt{\frac{p(1-p)}{n}} \leq d$$

and assuming $p = 0.5$, the minimum sample size was:

$$n \geq \frac{\left(z_{\frac{\alpha}{2}}\right)^2}{4d^2}$$

In the study, the confidence ratio was $1 - \alpha = 0.8$ and $d = 0.05$. In this situation, $n > 165$, so the obtained number $n = 188$ meets the assumptions of the maximum error in estimating the fraction, which is less than 5% with 80% probability.

The control sample consists of full-time employees who were also successful but did not run their own business. Their success is based on obtaining a high position (director, president), but they are wage earners. There were 21 such people in the control group. The studied control population of non-entrepreneurs was characterized by:

- Age (over 30—lower limit of the OCEAN model);
- Work experience (minimum 20 years);
- Belonging to the top management in the organization (director position or higher).

The procedure of selecting the control sample consisted of observing the estimator of the mean and the variance of the level of individual OCEAN traits (the final results for the entire control sample are presented in Table 2, together with the results for the test sample). The selection of elements for the control sample started from number 1, then subsequent observations were selected successively. The sampling was completed when the results stabilized at the level presented in Table 2, i.e., each subsequent element of the sample did not cause significant changes in the mean estimator (verification was performed with the Student's *t*-test) and the variance (verification with Levene's test). Moreover, capturing the statistically significant differences between the test group and the control group, which were described in this study, allows us to assume that the size of the control sample is sufficient to make a statistical inference.

The population of the entrepreneurial sample was then compared to the control population for OCEAN traits. The OCEAN traits in these two populations were characterized by descriptive statistics:

- Mean;
- Standard deviations;
- Minimum and maximum;
- Median and quartiles.

Differences in the levels of intensity of individual OCEAN traits between the study group and the control group were verified with the F test of means and the F test of variance. Two null hypotheses were tested:

H0(A). *The mean distributions for the OCEAN traits do not differ significantly.*

H0(B). *The distribution of differences for the OCEAN traits do not differ significantly.*

Table 2. Statistics of the OCEAN personality model traits.

Statistics	The Trait in BIG5									
	O		C		E		A		N	
	ent.	con.	ent.	con.	ent.	con.	ent.	con.	ent.	con.
Mean	67.4	73.0	67.6	75.1	67.6	54.1	78.1	72.0	34.6	42.7
SD	11.8	7.7	19.9	7.0	13.5	11.2	11.5	7.2	13.3	9.4
Minimum	33	56	27	62.5	25	37.5	35	56	2	17
Q25	62.5	71	48	69	58	48	69	69	27	42
Median	70	74	73	75	71	51	79	73	35	47
Q75	74	77	86.75	80	77	52.5	87.5	78	40.5	48
Maximum	90	90	100	92	92	81	100	81	81	52
Averages test	0.0342		0.0877		0.0000		0.0183		0.0074	
Variance test	0.0363		0.0000		0.2518		0.0066		0.1250	

The study gives the significance levels p of these means. The cut-off value was 0.05; therefore, the p-level values lower than 0.05 were taken as evidence of a significant difference between the test group and the control group. An error of less than 0.05 was considered sufficient to reject the null hypothesis and consider the difference between the test and control group statistically significant.

The distributions of the mean levels and variation in the OCEAN traits are shown graphically.

The last part of the study was the construction of a logistic regression model of the form:

$$P(Y = 1 \mid x_1, x_2, \ldots, x_k) = \frac{e^{a_0 + \sum_{i=1}^{k} a_i x_i}}{1 + e^{a_0 + \sum_{i=1}^{k} a_i x_i}}$$

where:

$P(Y = 1)$—determination of the probability of success as an entrepreneur;

x_i—OCEAN trait values;

a_i—structural parameters of the model.

The test group defined as $Y = 1$ were people who achieved success as an entrepreneur, while the control group defined by $Y = 0$ is an alternative here.

The significance of individual model parameters (t-test) and the significance of the model as a whole (chi-square test) were examined. As with the distributions, p-level values are also provided here. P-level values lower than 0.05 were considered evidence of the statistical significance of the obtained structural parameters of the model and the significance of the model as a whole.

Based on this model, it becomes possible to estimate the probability of success as an entrepreneur.

3. Results

3.1. Metrics

The research began with the description of the study group metrics. Figure 1 presents the most important parameters of metrics related to the assessed group.

The researched group of entrepreneurs is dominated by people aged 45–50 of whom are about 40%. The second largest group of entrepreneurs is aged 50–55. There were about 30% of such people. Other age groups are represented less frequently. Such a result is positively correlated with business practice, because people who established enterprises as young people in the 1990s are middle-aged today. In addition to the dominant middle-aged population, the sample also included relatively young people (over 35), people close to retirement age (over 60) and even retirees (over 65). However, these are very rare cases.

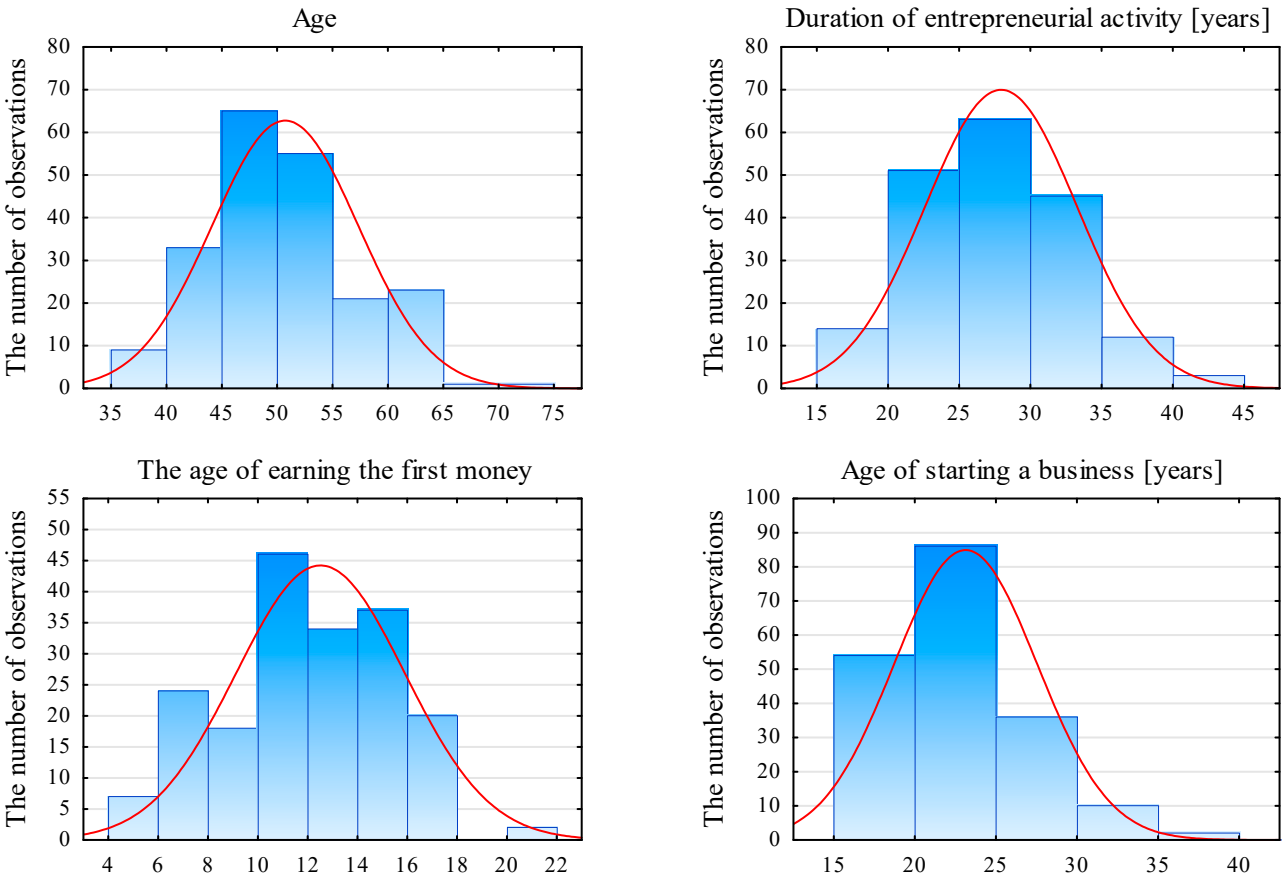

Figure 1. Research sample group metrics (Appendix B).

The age of people corresponds to the number of years of running a business, where a predominant number of people have been operating for 25–30 years, but there are also quite numerous groups of 20–25 and 30–35 years of running the enterprise. Together, these three groups account for approximately 85% of the total.

The results of the survey of the age when entrepreneurs earned their first money are very interesting. Practically in all cases, it is under 18, and the dominant group are people who earned their first money at the age of 10–12, about 25% of such people in the study. The groups of 12–14 and 14–16 years old are also relatively numerous (around 20%). The youngest people included in the study were under 6 years old when they earned their first money.

Entrepreneurs were also described in terms of the age of starting a business. In general, it was mostly between 20 and 25 years (45%), but quite often also under 20 (30%). As the market economy was introduced in Poland in the early 1990s, the conditions for family intergenerational accession were not created, hence the dominant ideas for economic activity were taken from market opportunities, by chance or by hobby. Such reasons prevail in the surveyed population (Figure 2), where a market niche was indicated by 41% of respondents as the basis for starting a business, a hobby by 29% and a coincidence by 17%. Other possibilities, such as a father's suggestion, friend's suggestion, family business or inheritance, were picked up by only a few people.

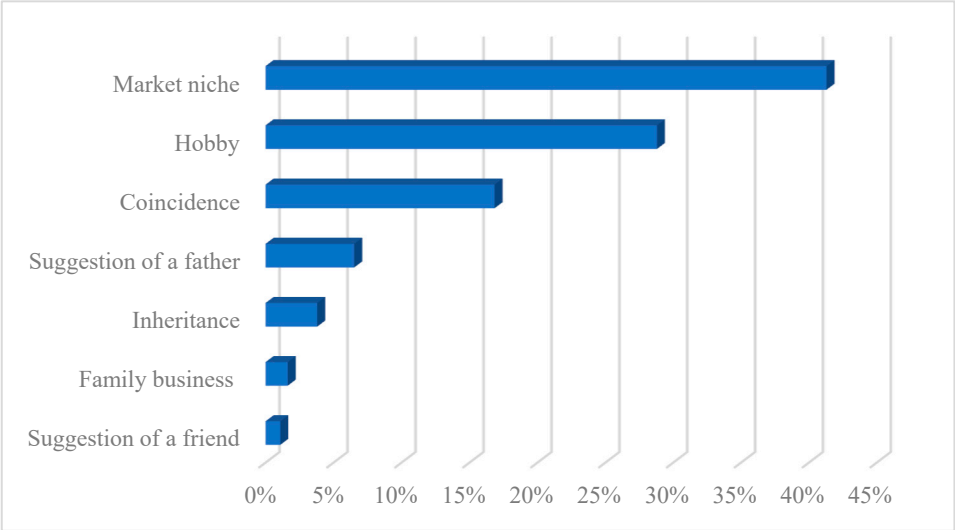

Figure 2. The source of the idea for running a business (Appendix B).

3.2. The BIG5 Model in the Test Results

Virtually all OCEAN personality traits differ significantly between the studied group of entrepreneurs and the control group (Table 2). For the OEAN traits, the significance levels were significantly lower than 0.05 and for the C trait the obtained significance level (0.0877) was close to the value of 0.05, from which the difference was assumed to be significant.

Entrepreneurs have OCN traits at a level lower than that of the control group and EA traits at a level higher than that of the control group. The mean values obtained here were at the level of, respectively:

- O—test group 67.4 and control group 73.0;
- C—test group 67.6 and control group 75.1;
- E—test group 67.6 and control group 54.1;
- A—test group 78.1 and control group 72.0;
- N—test group 34.6 and control group 42.7, which positively verifies H1.

In the case of OEAN traits, the results can be considered strong because the direction (lower or higher level of trait intensity) can be noticed not only in the case of mean values to which the significance test directly relates, but also medians and quartiles.

Importantly and surprisingly, there is clearly a greater differentiation in the results of OCEAN traits values within the entrepreneurs group. For each trait, the standard deviation of the results is greater for the test group than for the control group. Sometimes the differences are so great that they can be considered statistically significant (OCA traits).

The above-characterized phenomenon of differences in the levels of OCEAN traits is shown in Figure 3. The similar levels of OCE traits in the study group are quite interesting. However, the highest level of intensity is characterized by trait A. The trait N, whose level is very low, clearly differs from these traits. In the control group, OCA traits dominate, trait E and trait A are characterized by a significantly lower intensity. Consequently, there are premises for a positive verification of H2.

Correlations between the values of individual traits are usually weak, sometimes statistically significant (red). The strongest correlation concerns traits C and A, where 0.5306 was obtained for the control group. Low correlations are important as they show that individual OCEAN components measure different characteristics (Table 3).

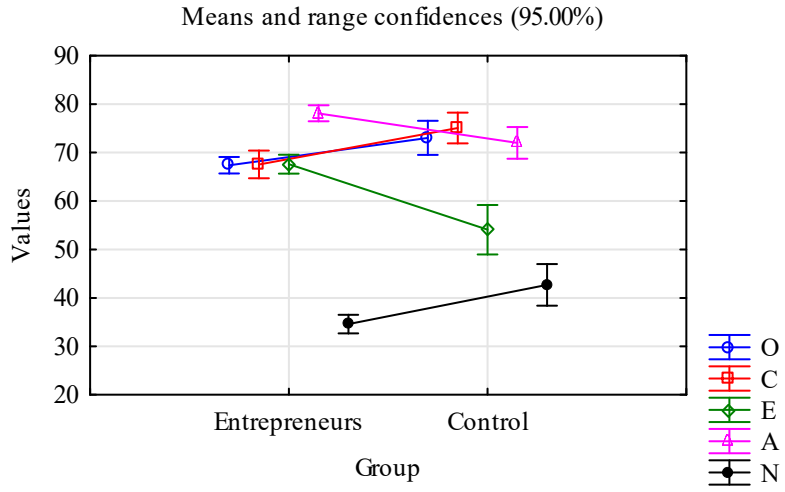

Figure 3. Average values of the OCEAN traits.

Table 3. Correlation coefficients between the OCEAN traits.

	O	C	E	A	N
O		−0.3341 0.2932	0.2149 0.2099	−0.0872 0.2346	−0.0536 0.2183
C	−0.3341 0.2932		−0.1506 0.0405	0.2356 0.5306	−0.1554 0.4574
E	0.2149 0.2099	−0.1506 0.0405		−0.2106 −0.3295	0.0209 −0.0284
A	−0.0872 0.2346	0.2356 0.5306	−0.2106 −0.3295		−0.2672 0.2156
N	−0.0536 0.2183	−0.1554 0.4574	0.0209 −0.0284	−0.2672 0.2156	

[1] Explanations: the first number in the cell—correlations for entrepreneurs; the second number in the cell—correlations for the control group.

Based on the results of the test sample and the control sample, a logistic regression model was created, allowing the estimation of the probability of success as an entrepreneur:

$$P(Y=1) = 1 - \frac{\exp(-2.5554 + 0.1186O + 0.0798C - 0.1279E - 0.1124A + 0.0546N)}{1 + \exp(-2.5554 + 0.1186O + 0.0798C - 0.1279E - 0.1124A + 0.0546N)}$$

The model as a whole has good statistical significance (p-level <0.0005). Moreover, taking into account the individual parameters, it turns out that they are all statistically significant. The relevant significance levels here are:

- O—0.0021;
- C—0.0026;
- E—0.0001;
- A—0.0015;
- N—0.0261.

By observing the values of individual parameters and their levels of significance, it turns out that the levels of trait E are the key to success, although the others are also, but to a lesser extent, statistically significant. The above conditions determine the positive verification of H3.

4. Discussion

Over the past three decades, personality traits have become one of the most important estimators of work outcomes and numerous meta-analyses have shown that personality

traits are predictive of work performance and other work outcomes [80,81]. Since the breakthrough meta-analysis by Barrick and Mount [82] on the relationships between the intensities of personality trait levels in the Big Five model and overall work performance, the results of subsequent meta-analyses aimed at studying the relationships between personality traits in the Big Five Model have confirmed the correlation of the BIG5 level with unproductive behaviors [83], leadership [84], context [85] as well as moderating the effects of the profession, situational factors and measurement methods. The results of meta-analyses also reveal that certain personality traits (i.e., extraversion and agreeableness) are important for the successful work performance in professions requiring a high level of social interaction, such as sales [86]. Dozens of unique meta-analyses of the relationship between the Big Five traits and performance have also been published to date, each of which differs to some extent in terms of personality measures, performance scores or research samples included. Following this, the meta-analyses investigated the relationship between the Big Five traits and the results of specific personality inventories [87], forced choice measures [88] and other rankings opposed to personality self-assessment [89]. In addition, meta-analyses investigated the relationship between the Big Five traits and performance at work and learning, as well as computer programming [90], creativity [91], interpersonal sensitivity [90], leadership effectiveness [91] and negotiating abilities [92]. Finally, some meta-analyses of personality–performance relationships focused on specific populations, such as children [93], students [94], salespeople [95], Europeans [96] or South Africans [97]. Although the "input–output" relationships are determined by the criterion dimension and, to a lesser extent, the measurement and situational factors, the results of these meta-s show remarkable consistency. The above observations are reflected in the results of the conducted research.

The main purpose of the study was to provide a confirmatory analysis of the relation between the personality traits of an entrepreneur and their effectiveness (understood as an ability to survive (adapt) in a changing, turbulent economic environment), by including scales that were explicitly designed to measure the Big Five personality dimensions. The analysis showed that the level of extraversion intensity is strictly correlated to entrepreneurial efficiency, which confirms the previous research of Barrick et al. [80], Bing and Lounsbury [98] and Vinchur et al. [95], which found that extraversion was a valid predictor of performance in jobs characterized by social interaction, such as sales personnel and managers. Our research results prove that extending induction to entrepreneurs is justifiable. Moreover, they are highly consistent with the opinions of Minbashian et al. ([99], p. 546) who provided insight into the nature of the relationship between extraversion and managerial performance, or Gridwichai et al. [100] who discovered the same relation in the context of service performance and finally with Wihler et al. [101] who proved the positive relation between the level of extraversion and adaptive performance.

The research results also reveal that gender is statistically significant for succeeding as an entrepreneur in Poland, as 88 percent of research participants were men.

Implicitly or explicitly, the model of Costa and McCrae developed and tested in this study received general support. A direct comparison of the variables comprising theoretical explanations suggested that the trait activation theory may be relatively important in explaining when and how personality trait intensity is predictive of job performance. While some have questioned the practical relevance of personality variables for human resource selection decisions [102,103], the results imply that, when there is reason to believe that the trait is relevant to the job context, validities cannot be characterized as "disappointingly low" [104] to any but the most captious observer. In responding to Morgeson et al.'s [105] critique of the personality–performance literature, Tett and Christiansen [106] claimed, "The ideal situation for any worker is one providing opportunities to express his or her traits . . . such that trait expression is valued positively by others" (p. 1168).

According to the model of entrepreneurial success, the positive verification of H3 enables the new opening for future research directions. This is the first construction which correlates several hundred years of scientific achievements with the realities of

contemporary organizational practice. Referring to the trait intensity levels, it is possible to predict an individual's entrepreneurial success with only a 5% error rate. Yet, this statement should be considered a determinant of the opportunity. Similar to the Big Five model, the pillar of our model has its boundaries, the most crucial being the minimum 30 years of age. Majority of reviewed entrepreneurs started their business earlier (Figure 1); therefore, the predictive value of our model is limited. Moreover, all personality measures include some degree of random error, which is reflected in the reality of the test as well as systematic errors that can lead to data misinterpretation. Systematic bias or tendentiousness cannot be distinguished from true variance, when based on one common source of information. When Kandler et al. [107] focused on a combination of self-reports and peer ratings in their heredity research studies, they observed significantly higher levels of heritability than are usually reported. Moreover, Finch and Kirkwood [108] believe that coincidence plays a significant role in human biology. Genes design a strategy, but in the actual course of development, this strategy is not strictly followed. Mutations, intrauterine hormones and other factors subtly affect the end product, so "identical" twins are never completely identical. Authors emphasize that there is no reason to believe that this relationship is different in the case of personality traits, which are one (the only one, which is stable and constant, under conditions as mentioned above) of the three pillars of human personality. The other two are self-estimation and flexibility, which are modifiable in the relation to e.g., human behavior in the work environment, cultural (society) values adaptation abilities of an individual, what was described earlier and proven perfectly by Hofstede [109], Schwartz (e.g., Schwartz theory of basic values) [110] or Davidov [111]. The cited authors put the impact on other categories of human behavior—their opinions challenge our study results. Yet, the dissonance is seeming and the reservations do not apply to our work. The mentioned authors examined populations as a (part of the) whole without distinguishing between entrepreneurs and non-entrepreneurs. Moreover, our scientific interest was focused on the first pillar, which, as claimed by Costa and McCrae [27], is culture independent (neither national nor global).

5. Conclusions

Our results (positive verification of hypotheses) lead us to draw some general conclusions. The main contribution of this study relates to the finding that the Big Five personality traits can potentially be used for predicting entrepreneurial success (extraversion, hypothesis H3). We have contributed new evidence on the existence of entrepreneur-related personality characteristics by extending the Big Five personality research in entrepreneurship to an investigation of the psychological determinants of business-owners and the highest-level employees (H1). In methodological terms, we compared Big Five personality factors with two opposite groups of people characterized with one common denominator, effectiveness, on the basis of their economic activity or intentions (entrepreneurs versus non-entrepreneurs). The key difference in personality between practicing entrepreneurs versus their most valuable employees was found in the level of the extraversion trait (practicing entrepreneurs tend to be more "energetic" with all determinants such as risk taking, stress tolerance and "walking on the edge"). However, at this point it is necessary to mention the limitations described by Yerkes and Dodson, concerning the level of stress intensity and efficiency [112] and the limit values of the intensity of traits, exceeding which the level of entrepreneurial effectiveness may decline, such as the effect of negative marginal utility. The study also has implications for research and practice and policy. Entrepreneurship researchers may wish to consider putting the entrepreneur, including their personality, back among the crucial elements of new business formation. In particular, the Big Five personality factors should be given more emphasis. When studying the determinants of entrepreneurship, researchers need to pay careful attention to the level of entrepreneurial psychology-based activities or intentions. Moreover, when studying personality characteristics, controlling for gender can be considered a must because men and women may differ on some personality factors. In practice it may be useful for

people who are thinking about an entrepreneurial career to carry out self-testing and to evaluate the fit of their personality with the requirements of their potential career choice. Individuals and institutions making considerations about the equity or debt financing of entrepreneurs-to-be may find it handy to acquire information about their personality-based entrepreneurship potential. However, policymakers might wish to consider promoting and enhancing entrepreneurship-predictive personality factors (particularly extraversion) early on in the education system among children, teens and students who have the potential for the Big Five personality factor changes. In the context of the renewable sector, the polish market is characterized by high dynamics of growth (250.3%) last year only) [113] and, as a consequence, the equally high level of contractors' competitiveness. Therefore, successful operating in that sector in the long run requires one to possess the set of personality traits which will ensure the achievement of the competitive advantage.

6. Limitations

The five-factor model is limited in this study to the degree to which personality trait intensities express themselves in job performance. Beyond job analysis, little is known about the situational determinants or what variables are useful when comparing one situation with another [30]. Contemporary framework for characterizing the psychology-based aspects of a situation is a key factor method for assessing the above-mentioned variables. Moreover, future researchers must examine the process through which personality affects behavior at work. As claimed earlier, researchers must take into account the characteristics of a work environment (economical, practical, legal, etc.). This is a little removed from the degree to which personality expresses itself, and to which it expresses itself in behavior. While this approach was appropriate given the goals of the study, it is also important for future research studies to link how situations impede or activate the expression of traits and how these traits manifest in specific job behaviors that, in turn, lead to effectiveness. There are situations, for example, that influence the degree to which an extravert acts or behaves as an extravert, just as there are situations that an extravert may find more motivating or more likely to produce assertive behaviors than others. These sorts of expressions are distinct from (but often related to) job effectiveness, and the situational traits that lead to these kinds of expressions may be different from those which lead to effectiveness. As a consequence, this study has some limitations that require discussion.

It does not close the list of trait-relevant cues that might moderate personality–job performance relationships. In this study, the focus was on the entrepreneurial job effectiveness, or task-based cues, but there are other factors that may be relevant, such as human resource systems and organizational culture [30]. Future research might study those variables as situational moderators as well. The next issue future researchers should focus on is measurement problems. If it is not possible to guarantee the highest degree of precision, the results obtained will always be disputable. In this context, it is important to accept an assumption concerning the permanence of personality traits [25] and the response to items on a personality inventory, at any one moment, is determined by many traits, states and features of the immediate situation. Consequently, traits only usefully predict behavior when it is aggregated [114], either over a category of behaviors (e.g., counterproductive behavior) or across time (annual performance or longer). It is also important to underline that the global traits (e.g., Big Five) are best for explanation and theory development; however, the prediction of narrower and more specific behaviors at work will require correspondingly narrower trait constructs [115]. Effective measurement considers addressing both of these concerns; therefore, it is reasonable to claim that personality traits can explain behavior at work, particularly when it is aggregated across time and job situations. Personality indicates impressive consistencies over time even if a person's life situation changes [25], in a manner that can provide valuable information about what the individual is likely to do at work.

Author Contributions: Conceptualization, A.J. and A.S.-P.; Data curation, A.J. and A.S.-P.; Investigation, A.J. and A.S.-P.; Methodology, A.J. and A.S.-P.; Software, A.S.-P.; Supervision, A.J. All authors have read and agreed to the published version of the manuscript.

Funding: Koszalin University of Technology, Faculty of Economic Science, Department of Finance, Kwiatkowskiego 6E, 75-343 Koszalin.

Institutional Review Board Statement: This study did not require ethical approval.

Informed Consent Statement: Not applicable.

Data Availability Statement: The data that support the findings of this study are available from the author upon reasonable request.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Big Five Personality Traits Test

Rate Each Statement According to How Well It Describes You. Base Your Ratings on How You Really Are, Not How You Would Like to Be.			
	Inaccurate	Neutral	Accurate
I have a kind word for everyone			
I am always prepared			
I feel comfortable around people			
I often feel blue			
I believe in the importance of art			
I feel I am better than other people			
I avoid taking on a lot of responsibility			
I make friends easily			
There are many things that I do not like about myself			
I am interested in the meaning of things			
I treat everyone with kindness and sympathy			
I get chores done right away			
I am skilled in handling social situations			
I am often troubled by negative thoughts			
I enjoy going to art museums			
I accept people the way they are			
It's important to me that people are on time			
I am the life of the party			
My moods change easily			
I have a vivid imagination			
I take care of other people before taking care of myself			
I make plans and stick to them			
I do not like to draw attention to myself			
I often feel anxious about what could go wrong			
I enjoy hearing new ideas			
I start arguments just for the fun of it			
I always make good use of my time			
I have a lot to say			

Rate Each Statement According to How Well It Describes You. Base Your Ratings on How You Really Are, Not How You Would Like to Be.			
I often worry that I am not good enough			
I am not interested in abstract ideas			
I criticize other people			
I find it difficult to get to work			
I stay in the background			
I seldom feel blue			
I do not like art			
I stop what I am doing to help other people			
I change my plans frequently			
I do not talk a lot			
I feel comfortable with myself			
I avoid philosophical discussions			
Rate each word according to how well it describes you. Base your ratings on how you really are, not how you would like to be.			
	Inaccurate	Neutral	Accurate
Original			
Systematic			
Shy			
Soft-Hearted			
Tense			
Inquisitive			
Forgetful			
Reserved			
Agreeable			
Nervous			
Creative			
Self-Disciplined			
Outgoing			
Charitable			
Moody			
Imaginative			
Organized			
Talkative			
Humble			
Pessimistic			

Appendix B. Entrepreneur's Questionnaire

Question	Answer				
1. Present age?					
2. The duration of doing business?					
3. In what age did you earn the first money?					
4. In what age did you earn the first money as an entrepreneur?					
5. What were your motives to starting a business?					
6. Did anybody support you with the entrepreneurial knowledge? If Yes—who?					
7. What was the property status of your parents (in relation to the national average) in the moment of starting business?	Very poor	Poor	Average	Well	Very well
8. What was the source of the idea for running a business?					
9. Is the business characteristics coherent with your education profile?					
10. To what extent did the obtained (state) education provide knowledge that helped in doing business?	It hindered very badly	It hindered badly	It hindered moderately	Neither helped nor hindered	Helped moderately
	Helped well	Helped very well			
11. How did you perceive the risk level of starting business in that time?	None	Very low	Low	Neutral	Medium
	High	Very high			

References

1. Zhang, D. Energy Finance: Background, Concept, and Recent Developments. *Emerg. Mark. Financ. Trade* **2018**, *54*, 1687–1692. [CrossRef]
2. Melnychenko, O. The Energy of Finance in Refining of Medical Surge Capacity. *Energies* **2021**, *14*, 210. [CrossRef]
3. Korol, T. Evaluation of the Macro-and Micro-Economic Factors Affecting the Financial Energy of Households. *Energies* **2021**, *14*, 3512. [CrossRef]
4. Korol, T. Examining Statistical Methods in Forecasting Financial Energy of Households in Poland and Taiwan. *Energies* **2021**, *14*, 1821. [CrossRef]
5. Casey, J.; Bradshaw, D. Aristotle East and West: Metaphysics and the Division of Christendom. *Sixt. Century J.* **2007**, *38*, 495. [CrossRef]
6. von Mises, L. *Human Action: A Treatise on Economics*; Yale University Press: New Haven, CT, USA, 2010.
7. Thorton, M. *An Essay on Economic Theory*; An English translation of Richard Cantillon's Essai sur la Nature du Commerce en Général; Mises Institute: Auburn, AL, USA, 2010.
8. Schumpeter, J.A. *The Theory of Economic Development*; Harvard University Press: Cambridge, MA, USA, 1912.
9. Knight, F.H. *Risk, Uncertainty and Profit*; Houghton-Mifflin: New York, NY, USA, 1921.
10. Carpini, J.A.; Parker, S.K.; Griffin, M.A. A look back and a leap forward: A review and synthesis of the individual work performance literature. *Acad. Manag. Ann.* **2017**, *11*, 825–885. [CrossRef]
11. O'Shea, J. Hayek's Spiritual Science. *Mod. Intellect. Hist.* **2020**, *19*, 473–498. [CrossRef]
12. Kirzner, I. *Perception, Opportunity and Profit: Studies in the Theory of Entrepreneurship*; University of Chicago Press: Chicago, IL, USA, 1979.
13. Roberts, B.W.; DelVecchio, W.F. The rank-order consistency of personality traits from childhood to old age: A quantitative review of longitudinal studies. *Psychol. Bull.* **2000**, *126*, 3–25. [CrossRef]
14. Roberts, B.W.; Jackson, J.J. Sociogenomic Personality Psychology. *J. Personal.* **2008**, *76*, 1523–1544. [CrossRef]

15. Ashton, M.C.; Lee, K. Empirical, theoretical, and practical advantages of the HEXACO model of personality structure. *Personal. Soc. Psychol. Rev.* **2007**, *11*, 150–166. [CrossRef]
16. Myers, I.B.; McCaulley, M.H.; Quenk, N.L.; Hammer, A.L. *MBTI Manual: A Guide to the Development and Use of the Myers-Briggs Type Indicator*, 3rd ed.; Consulting Psychologists Press: Palo Alto, CA, USA, 1998.
17. Cattell, R.B.; Eber, H.W.; Tatsuoka, M.M. *Handbook for the Sixteen Personality Factor Questionnaire (16 PF)*; Institute for Personality and Ability Testing: Champaign, IL, USA, 1970.
18. John, O.P.; Donahue, E.M.; Kentle, R.L. *The Big Five Inventory-Versions 4a and 54*; Institute of Personality and Social Research, University of California: Berkeley, CA, USA, 1991. [CrossRef]
19. John, O.P.; Naumann, L.P.; Soto, C.J. Paradigm shift to the integrative big five trait taxonomy. In *Handbook of Personality: Theory and Research*; The Guilford Press: New York, NY, USA, 2008; Volume 3, pp. 114–158.
20. Allport, G.W.; Odbert, H.S. Trait-names: A psycho-lexical study. *Psychol. Monogr. Gen. Appl.* **1936**, *47*, 47. [CrossRef]
21. Cattell, R.B. The description of personality: Basic traits resolved into clusters. *J. Abnorm. Soc. Psychol.* **1943**, *38*, 476–506. [CrossRef]
22. Costa, P.T., Jr.; McCrae, R.R. Age differences in personality structure: A cluster analytic approach. *J. Gerontol.* **1976**, *31*, 564–570. [CrossRef] [PubMed]
23. Chapman, B.P.; Goldberg, L.R. Act-frequency signatures of the Big Five. *Personal. Individ. Differ.* **2017**, *116*, 201–205. [CrossRef]
24. Costa, P.T., Jr.; McCrae, R.R.; Löckenhoff, C.E. Personality Across the Life Span. *Annu. Rev. Psychol.* **2019**, *70*, 423–448. [CrossRef]
25. McCrae, R.R.; Costa, P.T., Jr. Toward a New generation of personality theories, theoretical contexts of for The Five-factor model. In *The Five-Factor Model of Personality: Theoretical Perspectives*; Wiggins, J.S., Ed.; Guilford Press: New York, NY, USA, 1996; pp. 51–87.
26. McCrae, R.R.; Costa, P.T., Jr.; Ostendorf, F.; Angleitner, A.; Hřebíčková, M.; Avia, M.D.; Sanz, J.; Sánchez-Bernardos, M.L.; Kusdil, M.E.; Woodfield, R.; et al. Nature over nurture: Temperament, personality, and life span development. *J. Personal. Soc. Psychol.* **2000**, *78*, 173–186. [CrossRef]
27. McCrae, R.R.; Costa, P.T., Jr. Understanding persons: From Stern's personalistics to Five-Factor Theory. *Personal. Individ. Differ.* **2021**, *169*, 109816. [CrossRef]
28. Simsek, O.F. Higher-order factors of personality in self-report data: Self-esteem really matters. *Personal. Individ. Differ.* **2012**, *53*, 568–573. [CrossRef]
29. Fischer, R. *Personality, Values, Culture: An Evolutionary Approach*; Cambridge University Press: Cambridge, MA, USA, 2017. [CrossRef]
30. Choi, D.; Oh, I.-S.; Colbert, A.E. Understanding organizational commitment: A meta-analytic examination of the roles of the five-factor model of personality and culture. *J. Appl. Psychol.* **2015**, *100*, 1542–1567. [CrossRef]
31. Sinangil, H.K.; Viswesvaran, C.; Ones, D.S.; Anderson, N. Organizational perspectives: Organizational psychology. In *Handbook of Industrial, Work and Organizational Psychology*; Anderson, N., Ones, D.S., Sinangil, H.K., Viswesvaran, C., Eds.; SAGE Publications Ltd.: Thousand Oaks, CA, USA, 2001; Volume 2, pp. 1–7. [CrossRef]
32. Judge, T.A.; Zapata, C.P. The person–situation debate revisited: Effect of situation strength and trait activation on the validity of the big five personality traits in predicting job performance. *Acad. Manag. J.* **2014**, *58*, 1149–1179. [CrossRef]
33. Digman, J.M. Personality structure: Emergence of the five-factor model. *Annu. Rev. Psychol.* **1990**, *41*, 417–440. [CrossRef]
34. McCrae, R.R.; John, O.P. An introduction to the five-factor model and its applications. *J. Personal.* **1992**, *60*, 175–215. [CrossRef]
35. Briley, D.A.; Tucker-Drob, E.M. Genetic and environmental continuity in personality development: A meta-analysis. *Psychol. Bull.* **2014**, *140*, 1303–1331. [CrossRef]
36. Fraley, R.C.; Roisman, G.I.; Booth-LaForce, C.; Owen, M.T.; Holland, A.S. Interpersonal and genetic origins of adult attachment styles: A longitudinal study from infancy to early adulthood. *J. Personal. Soc. Psychol.* **2013**, *104*, 817–838. [CrossRef] [PubMed]
37. Campbell, J.P. Modeling the performance prediction problem in industrial and organizational psychology. In *Handbook of Industrial and Organizational Psychology*, 2nd ed.; Dunnette, M.D., Hough, L.M., Eds.; Consulting Psychologists Press: Palo Alto, CA, USA, 1990; Volume 1, pp. 687–732.
38. Campbell, J.P.; McCloy, R.A.; Oppler, S.H.; Sager, C.E. A theory of performance. In *Personnel Selection in Organizations*; Schmitt, N., Borman, W.C., Eds.; Jossey-Bass: San Francisco, CA, USA, 1993; pp. 35–70.
39. Griffin, M.A.; Neal, A.; Parker, S.K. A new model of work role performance: Positive behavior in uncertain and interdependent contexts. *Acad. Manag. J.* **2007**, *50*, 327–347. [CrossRef]
40. Bartram, D. The Great Eight competencies: A criterion-centric approach to validation. *J. Appl. Psychol.* **2005**, *90*, 1185–1203. [CrossRef] [PubMed]
41. O'Boyle, E.H.; Humphrey, R.; Pollack, J.M.; Hawver, T.H.; Story, P.A. The relation between emotional intelligence and job performance: A meta-analysis. *J. Organ. Behav.* **2011**, *32*, 788–818. [CrossRef]
42. Spencer, S.J.; Logel, C.; Davies, P.G. Stereotype threat. *Annu. Rev. Psychol.* **2016**, *67*, 415–437. [CrossRef]
43. Ericsson, K.A. Deliberate Practice and Acquisition of Expert Performance: A General Overview. *Acad. Emerg. Med.* **2008**, *15*, 988–994. [CrossRef]
44. Cooper, H.; Koenka, A.C. The overview of reviews: Unique challenges and opportunities when research syntheses are the principal elements of new integrative scholarship. *Am. Psychol.* **2012**, *67*, 446–462. [CrossRef]
45. Hagger, M.S.; Chatzisarantis, N.; Alberts, H.; Anggono, C.O.; Batailler, C.; Birt, A.R.; Brand, R.; Brandt, M.; Brewer, G.; Bruyneel, S.; et al. A multilab preregistered replication of the ego-depletion effect. *Perspect. Psychol. Sci.* **2016**, *11*, 546–573. [CrossRef] [PubMed]

46. Rhodes, M.G. Age-related differences in performance on the Wisconsin Card Sorting Test: A meta-analytic review. *Psychol. Aging* **2004**, *19*, 482–494. [CrossRef] [PubMed]
47. Hyde, J.S. Gender Similarities and differences. *Annu. Rev. Psychol.* **2014**, *65*, 373–398. [CrossRef] [PubMed]
48. Westrick, P.A.; Le, H.; Robbins, S.B.; Radunzel, J.M.R.; Schmidt, F.L. College performance and retention: A meta-analysis of the predictive validities of ACT scores, high school grades, and SES. *Educ. Assess.* **2015**, *20*, 23–45. [CrossRef]
49. Furnham, A. *The Psychology of Behaviour at Work: The Individual in the Organization*; Psychology Press: London, UK, 2006. [CrossRef]
50. Langelaan, S.; Bakker, A.; van Doornen, L.J.; Schaufeli, W.B. Burnout and work engagement: Do individual differences make a difference? *Personal. Individ. Differ.* **2006**, *40*, 521–532. [CrossRef]
51. Woods, S.A.; Patterson, F.C.; Koczwara, A.; Sofat, J.A. The value of being a conscientious learner. *J. Work. Learn.* **2016**, *28*, 424–434. [CrossRef]
52. De Janasz, S.; Crossman, J. *Teaching Human Resource Management: An Experiential Approach*; Elgar Guides to Teaching; Edward Elgar Publishing: Cheltenham, UK, 2018. [CrossRef]
53. Oldham, G.R.; Fried, Y. Job design research and theory: Past, present and future. *Organ. Behav. Hum. Decis. Process.* **2016**, *136*, 20–35. [CrossRef]
54. Soh, M.; Zarola, A.; Palaiou, K.; Furnham, A. Work-related well-being. *Health Psychol. Open* **2016**, *3*, 2055102916628380. [CrossRef]
55. Chung, B.G.; Dean, M.A.; Ehrhart, K.H. Inclusion values, practices and intellectual capital predicting organizational outcomes. *Pers. Rev.* **2021**, *50*, 709–730. [CrossRef]
56. Frieder, R.E.; Wang, G.; Oh, I.-S. Linking job-relevant personality traits, transformational leadership, and job performance via perceived meaningfulness at work: A moderated mediation model. *J. Appl. Psychol.* **2018**, *103*, 324–333. [CrossRef]
57. Campbell, J.P.; Wiernik, B.M. The Modeling and Assessment of Work Performance. *Annu. Rev. Organ. Psychol. Organ. Behav.* **2015**, *2*, 47–74. [CrossRef]
58. Rothmann, I.; Cooper, L.C. *Work and Organizational Psychology*; Routledge: London, UK, 2015. [CrossRef]
59. Motowidlo, S.J. Implicit Trait Policies in Personality Research. *Eur. J. Personal.* **2017**, *31*, 472–473.
60. Lassnigg, L. Competence-based education and educational effectiveness: A critical review of the research literature on outcome-oriented policy making in education. In *Competence-Based Vocational and Professional Education: Bridging the World of Work and Education*; Mulder, M., Ed.; Springer: Singapore, 2017; pp. 667–694. [CrossRef]
61. Rotundo, M.; Sackett, P.R.; Enns, J.R.; Mann, S. Refocusing Effort Across Job Tasks: Implications for Understanding Temporal Change in Job Performance. *Hum. Perform.* **2012**, *25*, 201–214. [CrossRef]
62. Barrick, M.R.; Mitchell, T.R.; Stewart, G.L. *Situational and Motivational Influences on Trait Behavior Relationships*; Josey-Bass: San Francisco, CA, USA, 2003; pp. 362–364.
63. Leung, M.-Y.; Chan, I.Y.S.; Cooper, C.R. *Stress Management in the Construction Industry*; John Wiley & Sons: New York, NY, USA, 2014. [CrossRef]
64. Eysenck, M.W. *Attention and Arousal: Cognition and Performance*; Springer: Berlin/Heidelberg, Germany, 1982. [CrossRef]
65. Hockey, R.J.; Gaillard, W.K.A.; Coles, M.G.H. *Energetics and Human Information Processing*; Behavioural and Social Science; NATO ASI Series; Springer Science & Business Media: Drechtsteden, Danmark, 1986; ISBN -13-978-94-010-8479-6.
66. Kahneman, D.; Tversky, A. Prospect theory: An analysis of decision under risk. *Econometrica* **1979**, *47*, 263–292. [CrossRef]
67. Van Frederikslust, R.A.I. *Predictability of Corporate Failure: Models for Prediction of Corporate Failure and for Evaluation of Debt Capacity*; Martinus Nijhoff Social Sciences Division: Boston, MA, USA, 1978. [CrossRef]
68. Craft, J.L. A Review of the Empirical Ethical Decision-Making Literature: 2004–2011. *J. Bus. Ethics* **2013**, *117*, 221–259. [CrossRef]
69. Li, Y.; Ahlstrom, D. Risk-taking in entrepreneurial decision-making: A dynamic model of venture decision. *Asia Pac. J. Manag.* **2019**, *37*, 899–933. [CrossRef]
70. European Commission Eurostat. Available online: https://ec.europa.eu/eurostat/web/main/data/database (accessed on 28 April 2022).
71. TMF Group, Global Business Complexity Index 2021. Available online: https://www.tmf-group.com/en/news-insights/publications/2021/global-business-complexity-index (accessed on 30 April 2022).
72. Williamson, J.B.; Karp, D.A.; Dalphin, J.R.; Grey, P.S. *The Research Craft*; Little, Brown: Boston, MA, USA, 1982.
73. Anderson, J.C.; Gerbing, D.W. Predicting the performance of measures in a confirmatory factor analysis with a pretest assessment of their substantive validities. *J. Appl. Psychol.* **1991**, *76*, 732–740. [CrossRef]
74. Kerlinger, F. *Foundations of Behavioural Research*; Holt, Rinehart, Winston: New York, NY, USA, 1986.
75. Ford, J.K.; MaCcallum, R.C.; Tait, M. The application of exploratory factor analysis in applied psychology: A critical review and analysis. *Pers. Psychol.* **1986**, *39*, 291–314. [CrossRef]
76. Eisenhardt, K.M.; Graebner, M.E. Theory building from cases: Opportunities and challenges. *Acad. Manag. J.* **2007**, *50*, 25–32. [CrossRef]
77. Araujo, L.M.; Dubois, A. *Research Methods in Industrial Marketing Studies*; Wiley: Chichester, UK, 2004; pp. 207–228.
78. Dubois, A.; Gadde, L.-E. Systematic combining: An abductive approach to case research. *J. Bus. Res.* **2002**, *55*, 553–560. [CrossRef]
79. Gibbert, M.; Ruigrok, W. The What and How of Case Study Rigor: Three Strategies Based on Published Work. *Organ. Res. Methods* **2010**, *13*, 710–737. [CrossRef]
80. Barrick, M.R.; Mount, M.K.; Judge, T.A. Personality and performance at the beginning of the new millennium: What do we know and where do we go next? *Int. J. Sel. Assess.* **2001**, *9*, 9–30. [CrossRef]

81. Ones, D.S.; Dilchert, S.; Viswesvaran, C.; Judge, T.A. In support of personality assessment in organizational settings. *Pers. Psychol.* **2007**, *60*, 995–1027. [CrossRef]
82. Barrick, M.R.; Mount, M.K. The Big Five personality dimensions and job performance: A meta-analysis. *Pers. Psychol.* **1991**, *44*, 1–26. [CrossRef]
83. Berry, C.M.; Ones, D.S.; Sackett, P.R. Interpersonal deviance, organizational deviance, and their common correlates: A review and meta-analysis. *J. Appl. Psychol.* **2007**, *92*, 410–424. [CrossRef]
84. Derue, D.S.; Nahrgang, J.D.; Wellman, N.; Humphrey, S.E. Trait and behavioral theories of leadership: An integration and meta-analytic test of their relative validity. *Pers. Psychol.* **2011**, *64*, 7–52. [CrossRef]
85. Chiaburu, D.S.; Oh, I.-S.; Berry, C.M.; Li, N.; Gardner, R.G. The five-factor model of personality traits and organizational citizenship behaviors: A meta-analysis. *J. Appl. Psychol.* **2011**, *96*, 1140–1166. [CrossRef]
86. Janowski, A. Personality Traits and Sales Effectiveness: The Life Insurance Market in Poland. *J. Entrep. Manag. Innov.* **2018**, *14*, 143–160. [CrossRef]
87. Hogan, J.; Holland, B. Using theory to evaluate personality and job-performance relations: A socioanalytic perspective. *J. Appl. Psychol.* **2003**, *88*, 100–112. [CrossRef]
88. Salgado, J.F.; Anderson, N.; Tauriz, G. The validity of ipsative and quasi-ipsative forced-choice personality inventories for different occupational groups: A comprehensive meta-analysis. *J. Occup. Organ. Psychol.* **2015**, *88*, 797–834. [CrossRef]
89. Connelly, B.S.; Ones, D.S. An other perspective on personality: Meta-analytic integration of observers' accuracy and predictive validity. *Psychol. Bull.* **2010**, *136*, 1092–1122. [CrossRef] [PubMed]
90. Gnambs, T. What makes a computer wiz? Linking personality traits and programming aptitude. *J. Res. Personal.* **2010**, *58*, 31–34. [CrossRef]
91. Puryear, J.S.; Kettler, T.; Rinn, A.N. Relationships of personality to differential conceptions of creativity: A systematic review. *Psychol. Aesthet. Creat. Arts* **2017**, *11*, 59–68. [CrossRef]
92. Hall, J.A.; Andrzejewski, S.A.; Yopchick, J.E. Psychosocial correlates of interpersonal sensitivity: A meta-analysis. *J. Nonverbal Behav.* **2009**, *33*, 149–180. [CrossRef]
93. Poropat, A.E. A meta-analysis of adult-rated child personality and academic performance in primary education. *Br. J. Educ. Psychol.* **2014**, *84*, 239–252. [CrossRef] [PubMed]
94. McAbee, S.; Oswald, F.L. The criterion-related validity of personality measures for predicting GPA: A meta-analytic validity competition. *Psychol. Assess.* **2013**, *25*, 532–544. [CrossRef] [PubMed]
95. Vinchur, A.J.; Schippmann, J.S.; Switzer, F.S., III; Roth, P.L. A meta-analytic review of predictors of job performance for salespeople. *J. Appl. Psychol.* **1998**, *83*, 586–597. [CrossRef]
96. Salgado, J.F. The five factor model of personality and job performance in the European Community. *J. Appl. Psychol.* **1997**, *82*, 30–43. [CrossRef]
97. van Aarde, N.; Meiring, D.; Wiernik, B.M. The validity of the Big Five personality traits for job performance: Meta-analyses of South African studies. *Int. J. Sel. Assess.* **2017**, *25*, 223–239. [CrossRef]
98. Bing, M.N.; Lounsbury, J.W. Openness and Job Performance in U.S.-Based Japanese Manufacturing Companies. *J. Bus. Psychol.* **2000**, *14*, 515–522. [CrossRef]
99. Minbashian, A.; Bright, J.E.H.; Bird, K.D. Complexity in the relationships among the subdimensions of extraversion and job performance in managerial occupations. *J. Occup. Organ. Psychol.* **2009**, *82*, 537–549. [CrossRef]
100. Gridwichai, P.; Kulwanich, A.; Piromkam, B.; Kwanmuangvanich, P. Role of Personality Traits on Employees Job Perfor-mance in Pharmaceutical Industry in Thailand. *Syst. Rev. Pharm.* **2020**, *11*, 185–194. [CrossRef]
101. Wihler, A.; Meurs, J.A.; Wiesmann, D.; Troll, L.; Blickle, G. Extraversion and adaptive performance: Integrating trait activation and socioanalytic personality theories at work. *Personal. Individ. Differ.* **2017**, *116*, 133–138. [CrossRef]
102. Joyce, W.F.; Slocum, J.W. Top management talent, strategic capabilities, and firm performance. *Organ. Dyn.* **2012**, *41*, 183–193. [CrossRef]
103. Murphy, K.R. Why don't measures of broad dimensions of personality perform better as predictors of job performance? *Hum. Perform.* **2005**, *18*, 343–357. [CrossRef]
104. Schmitt, D.P. The Big Five related to risky sexual behaviour across 10 world regions: Differential personality associations of sexual promiscuity and relationship infidelity. *Eur. J. Personal.* **2004**, *18*, 301–319. [CrossRef]
105. Morgeson, F.P.; Campion, M.A.; Dipboye, R.L.; Hollenbeck, J.R.; Murphy, K.; Schmitt, N. Reconsidering the use of personality tests in personnel selection contexts. *Pers. Psychol.* **2007**, *60*, 683–729. [CrossRef]
106. Tett, R.P.; Christiansen, N.D. Personality tests at the crossroads: A response to Morgeson, Campion, Dipboye, Hollenbeck, Murphy, and Schmitt. *Pers. Psychol.* **2007**, *60*, 967–993. [CrossRef]
107. Kandler, C.; Bleidorn, W.; Riemann, R.; Angleitner, A.; Spinath, F.M. The genetic links between the Big Five personality traits and general interest domains. *Personal. Soc. Psychol. Bull.* **2011**, *37*, 1633–1643. [CrossRef]
108. Finch, C.E.; Kirkwood, T.B. *Chance, Development, and Aging*; Oxford University Press: New York, NY, USA, 2000.
109. Yerkes, R.M.; Dodson, J.D. The relation of strength of stimulus to rapidity of habit-formation. *J. Comp. Neurol. Psychol.* **1908**, *18*, 459–482. [CrossRef]
110. Schwartz, S.H. An Overview of the Schwartz Theory of Basic Values. Online Readings in Psychology and Culture. *Online Read. Psychol. Cult.* **2012**, *2*, 2307-0919. [CrossRef]

111. Cieciuch, J.; Davidov, E.; Vecchione, M.; Beierlein, C.; Schwartz, S.H. The Cross-National Invariance Properties of a New Scale to Measure 19 Basic Human Values: A Test Across Eight Countries. *J. Cross-Cult. Psychol.* **2014**, *45*, 764–776. [CrossRef]
112. Elbaek, C.T.; Lystbaek, M.N.; Mitkidis, P. On the psychology of bonuses: The effects of loss aversion and Yerkes-Dodson law on performance in cognitively and mechanically demanding tasks. *J. Behav. Exp. Econ.* **2022**, *98*, 101870. [CrossRef]
113. Energia ze Źródeł Odnawialnych w Polsce (2022). Available online: https://portalstatystyczny.pl/energia-ze-zrodel-odnawialnych-w-polsce-najnowsze-dane/ (accessed on 17 June 2022).
114. Pacini, R.; Epstein, S. The relation of rational and experiential information processing styles to personality, basic beliefs, and the ratio-bias phenomenon. *J. Personal. Soc. Psychol.* **1999**, *76*, 972–987. [CrossRef]
115. Brown, C.L.; Robitaille, A.; Zelinski, E.M.; Dixon, R.A.; Hofer, S.M.; Piccinin, A.M. Cognitive activity mediates the association between social activity and cognitive performance: A longitudinal study. *Psychol. Aging* **2013**, *31*, 831–846. [CrossRef]