



Ivana Bujan Katanec

Madlen Sabadija

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EXAMINING THE IMPACT OF ENTREPRENEURIAL TRAITS ON PERCEPTIONS OF ENTREPRENEURIAL SUCCESS

Abstract: *This paper analyzes the entrepreneurial traits of successful entrepreneurs from both theoretical and empirical perspectives. Qualitative secondary analysis is used to present metrics for determining the psychological profile of successful entrepreneurs, specifically owners of micro-companies. These metrics include the Entrepreneurial Self-Efficacy Scale, the Entrepreneurial Attitude Scale, and the Entrepreneurial Competency Model. The psychological profile of successful entrepreneurs is characterized by key traits such as self-confidence, perseverance, diligence, and patience, which form the foundation for achieving business success and maintaining psychological balance. The primary empirical research in this study examined the psychological profiles of a sample of 100 entrepreneurs from Northwestern Croatia. The paper tests five hypotheses regarding entrepreneurial traits and their impact on entrepreneurial success. The findings indicate that traits such as personal initiative, creativity, openness to new ideas, persistence, and a clear business vision significantly contribute to entrepreneurial success. The results support the hypotheses that personal initiative, creativity, and persistence are essential for overcoming challenges and driving innovation in business. Moreover, the importance of a clear business vision as a motivational factor underscores the necessity for entrepreneurs to maintain a focused and strategic approach.*

Key words: *entrepreneurial traits; mental strength; success perceptions*

JEL classification: *M13, M21, A2, M53*

1. Introduction

The term “successful entrepreneur” encompasses a range of psychological traits, characteristics, attitudes, and values present in individuals motivated to embark on new business ventures (Aguinis et al., 2008; Chandra, 1991; Hornaday & Aboud, 1971). Entrepreneurs are driven by a strong need for achievement, which compels them to undertake tasks that test their abilities (McClelland, 1961). They exhibit exceptional energy and assume responsibility for success, particularly when they believe they have a reasonable chance of achieving it through their own skills (Schollhammer & Kuriloff, 1989).

Understanding the psychology of entrepreneurship provides valuable insights into the factors contributing to entrepreneurial success. The distinctive traits and behaviors of entrepreneurs often differentiate them from others, driving them to innovate, take calculated risks, and build successful businesses. The emotional and mental

characteristics that propel entrepreneurial activities are rooted in fundamental theories of entrepreneurial traits, such as McClelland’s theory of achievement motivation, Rotter’s theory of locus of control, and action regulation theory (Frese, 2020). To accurately assess the psychological profile of successful entrepreneurs, it is crucial to develop a clear and precise measurement instrument. This includes various measurement scales, surveys, and other relevant tools. Examples of such measurement scales include the Entrepreneurial Self-Efficacy Scale (Chen, Greene, & Crick, 1998; Yen & Lin, 2022), the Entrepreneurial Attitude Orientation Scale (Robinson, Stimpson, Huefner, & Hunt, 1991), and the Tolerance for Ambiguity Scale (Budner, 1962). Survey instruments that assess the psychological characteristics of entrepreneurs may also include the Entrepreneur Competency Model (Man, Lau, & Chan, 2002), the Myers-Briggs Type Indicator (Myers & McCaulley, 1985), and DISC assessments (Marston, 1928), among others.



This paper presents and examines theories related to entrepreneurial traits, the integration and application of psychological principles within the entrepreneurial system, and the key traits (characteristics) of entrepreneurs associated with successful business management. The aim of this study is to demonstrate and clarify how specific entrepreneurial traits influence perceptions of entrepreneurial success in Northwestern Croatia. The scientific methods employed in this research are qualitative, utilizing induction and deduction in literature analysis, alongside descriptive research of the study sample. Empirical research methods include a structured questionnaire with measurement scales that have been validated in previous studies by other authors. Correlation analysis and Principal Component Analysis (PCA) were used to test the hypotheses presented in this paper.

The paper is structured as follows: After the introduction, the second chapter presents existing relevant research on entrepreneurial traits and psychology-related entrepreneurial theories. The third section provides the research results, and the fourth section summarizes the entire study.

2. Literature review

Entrepreneurial traits and behaviors have evolved in parallel with the recognition of the entrepreneur as an individual entity. The primary theories supporting the development of measurement scales for entrepreneurial traits and behaviors include human capital theory, personality theory, and trait psychology. These psychology-based theories provided the framework for developing instruments or tests aimed at assessing entrepreneurial personalities and characteristics. Numerous connections exist between individual psychology and personality traits, which are subsequently applied to the analysis of entrepreneurs. Although developing a measuring instrument is not without its challenges, the primary concern lies in crafting a robust instrument grounded in solid theoretical and conceptual foundations, capable of yielding reliable results and possessing strong predictive power.

Furthermore, a recurring question arises: is the entrepreneurial personality unidimensional or multidimensional? In other words, does it consist of one or more traits drawn from various personality dimensions? This question highlights the complexity of understanding and measuring entrepreneurial traits and underscores the impor-

ance of comprehensive and nuanced approaches to assessment.

Rotter's (1966) concept of locus of control (LOC) is a significant trait in entrepreneurship and serves as a foundation for self-efficacy (self-confidence). Locus of control is divided into two types: internal and external, and it is measured using the Locus of Control Scale (LCS). Individuals with an external locus of control tend to attribute outcomes to fate and believe their lives are governed by external forces such as economic conditions, technology, politics, and social factors. In contrast, individuals with an internal locus of control believe they can influence outcomes through their own abilities, effort, or skills, rather than being controlled by external forces. Kormanik & Rocco (2009) explored the implications of locus of control in leadership and organizational behavior, finding that leaders with an internal locus of control are more likely to adopt transformational leadership styles, which are effective in motivating and inspiring employees. It is argued that entrepreneurs generally exhibit a higher locus of control (Sequeira, McGee, & Mueller, 2001). A higher locus of control is especially crucial when establishing and sustaining new ventures (Hermanson, 1995) and achieving success (Rauch & Frese, 2007). Van Gelderen, Brand, Praag, & Bodewes (2008) found that internal locus of control is a significant predictor of entrepreneurial intentions. Their research showed that individuals with a strong belief in their ability to control outcomes are more likely to start a business. Rogoff, Lee, & Suh (2004) discovered that successful entrepreneurs often attribute their business outcomes to their actions and decisions, reflecting an internal locus of control. This belief is essential for taking responsibility for both successes and failures.

Winfried and Hacker's (1980) Action Regulation Theory (ART) provides a theoretical framework for understanding goal-directed behavior regulation. According to action regulation theory, control refers to an individual's ability to align their activities with specific goals (Frese & Zapf, 1994; Raabe, Frese & Beehr, 2007). Self-regulation theory posits that individuals' interactions with their environment allow them to guide goal-directed activities over time and under various circumstances (Karoly, 1993; Vohs & Baumeister, 2004). Interventions based on self-regulation theory aim to enhance control and self-regulation, demonstrating effectiveness in specific short-term employee behaviors such as job attendance (Frayne & Latham, 1987; Latham & Frayne, 1989), reduction of problematic workplace behaviors (Godat &



Brigham, 1999), and sales performance (Frayne & Geringer, 2000). However, limited evidence exists regarding interventions designed to achieve more complex, long-term goals, such as career development. Self-regulation theory is based on the premise that goals, plans, and feedback are crucial elements in regulating one's actions (Carver & Scheier, 1982; Frese & Sabini, 1985; Hacker, 1985). An action sequence, as described by Frese and Zapf (1994), typically involves the following steps: goal setting, information collection, planning, execution, and feedback. Individuals monitor their environments to gather information that aids in planning their actions. Based on their goals and the information collected, they formulate plans. Executing these plans involves actively influencing the environment in one's favor, with feedback providing information about the results of these actions. Consequently, personal initiative is characterized by self-starting, proactive, and persistent behavior in the face of obstacles (Frese, Kring, Soose, & Zempel, 1996).

Based on the aforementioned research, the authors posit the first hypothesis:

Hypothesis 1: Personal initiative and active participation significantly contribute to success in entrepreneurship.

According to McClelland (1967), entrepreneurs innovate and make decisions under conditions of uncertainty. They are characterized by a need for achievement or achievement orientation, which is the desire to stand out, advance, and grow. By focusing on this specific need, McClelland was able to challenge the then-prevailing "great man" theory of entrepreneurship, as well as religious theories of entrepreneurship. The need for achievement differs from the need for power, which is the desire to dominate others in all situations, and the need for affiliation, which is the desire for close relationships. Power and legitimacy can assist in fulfilling the need for achievement and are thus considered valuable means or resources that can help satisfy this need. McClelland posited that achievement orientation develops during childhood through family socialization that emphasizes high standards, self-reliance, and less authoritarian fathers. This orientation manifests in behaviors such as problem-solving, seeking feedback, achieving goals, and taking risks. McClelland also argued that the need for achievement is partly culturally determined, with some societies producing fewer individuals with strong achievement orientations. Additionally, meta-analytic evidence suggests that the need for achievement is stronger in entrepreneurs than in

managers (Stewart & Roth, 2007; Collins, Hanges, & Locke, 2004; Baum, Locke, & Smith, 2001). However, a limitation of such theories is that while many entrepreneurs may exhibit a need for achievement, many non-entrepreneurs may also have a strong need for achievement that is satisfied by success in other professional careers.

Based on the aforementioned the following hypotheses are formed:

Hypothesis 2: Creativity is essential for innovation and business development.

Hypothesis 3: Openness to new ideas and changes positively influences business success.

Obschonka and Stuetzer (2017) introduced the Entrepreneurial Personality System (EPS). Within the EPS framework, characteristic adaptations refer to a broad range of narrowly defined and variable entrepreneurial characteristics, such as self-efficacy, locus of control, and risk-taking (often referred to as specific entrepreneurial traits in studies). These adaptations also encompass entrepreneurial attitudes, values, motives, cognitions, and affects (e.g., entrepreneurial passion), which are considered proximal predictors in psychological models of entrepreneurial motivation, behavior, and success. The EPS is shaped over time by both personal and environmental factors (Silbereisen, Obschonka, & Kohlmann, 2014). Within the EPS framework, other entrepreneurial characteristics, such as entrepreneurial passion, are analyzed in greater depth (Bosma & Sanders, 2017; Rottner & Rauch, 2016), with entrepreneurial passion playing a critical role in shaping entrepreneurial behavior. According to the relevant research results the following hypotheses are formed:

Hypothesis 4: Persistence and effort are crucial for overcoming challenges in business.

Hypothesis 5: A clear business vision motivates entrepreneurs to achieve business goals.

The first personality tests and statistical processing of research results were conducted using factor analysis, with questionnaires being the measuring instruments for personality assessment. Nowadays, there are numerous other techniques available. Each dimension was assessed using an individual scale with consideration of various psychometric properties such as reliability, stability, and validity.

The identification of primary personality traits was established through Cattell's questionnaire (Cattell, 1977), specifically the standard 16PF test comprising 16 questions. However, this initial test



encountered some shortcomings, such as internal inconsistency, prompting other authors to attempt corrections aimed at improving the questionnaire.

Additionally, one of the most influential tests used for approximately fifty years is Eysenck's three-factor model (1997) which includes neuroticism, extroversion/introversion, and psychoticism as the three personality types. Presently, the five-factor model is widely used, addressing the limitations of the three-factor model by incorporating neuroticism, extroversion, openness, conscientiousness, and agreeableness as its components.

The foundational understanding of entrepreneurial traits traces back to the seminal works of Cantillon and Schumpeter. However, it was not until the advent of psychology, notably through the contributions of Mintzberg (1979) and Miller (1983), that the systematic measurement of entrepreneurial traits gained widespread recognition. Within psychology, several scholars have made notable contributions by developing personality tests. Examples include the Personal Preferences Test by Edwards (1959), the Personality Test by Jackson (1967), and the General Entrepreneurial Tendencies Test by Caird (1991). These tests aimed to capture various dimensions of personality relevant to entrepreneurship.

Contemporary personality measurement questionnaires often encompass scales that assess multiple personality traits or dimensions. These questionnaires are administered to populations, and the gathered data undergoes analysis, typically utilizing factor analysis. This statistical method helps identify underlying factors or dimensions within the data, enabling researchers to delineate specific personality traits or characteristics. Moreover, factor analysis aids in establishing norms tailored to specific populations, thereby enhancing the interpretation and applicability of personality measurement outcomes.

Several authors have conducted analyses on the typical methods of measuring entrepreneurial traits. Rauch (2009) examined fifty-one empirical papers to identify and assess these traits. Their significant contribution includes determining a baseline correlation coefficient of 0.242, proposed as a standard for measuring the relationship between entrepreneurial traits and performance.

Similarly, Wales (2011) scrutinized 158 empirical papers focusing on entrepreneurial traits. Common areas of investigation encompass risk propensity, innovation, and proactivity, with fewer studies exploring autonomy, competitive

aggressiveness, and locus of control. The majority of research is concentrated in developed countries such as the USA, Finland, Australia, and Denmark, with a noticeable dearth of studies in individual countries (e.g., Brazil, India, Russia) and emerging regions (e.g., Eastern Europe, the Middle East).

In the Republic of Croatia, a project has been undertaken leading to the development of an innovation test known as the Croatian Test of Innovation (2016). This structured questionnaire allows entrepreneurs to assess their innovation activities conveniently through an online platform. There are numerous measuring scales, i.e. measuring instruments used by various authors and the key authors used to construct the questionnaire in this research is shown in Table 1.

The development of measurement scales for assessing entrepreneurial traits and personality necessitates precision in both their creation and the selection of the appropriate population. Many studies on entrepreneurial traits and personality identify population selection as a significant challenge, given the complexity of sampling procedures. Once the measurement scales are established, additional questions arise regarding the relevance of the research context and contextual variables.

In most research endeavors, entrepreneurial traits are often examined in conjunction with environmental, sociological, and market factors due to their interconnectedness and mutual influence. This holistic approach recognizes the intricate interplay between individual traits and external influences, acknowledging their combined impact on entrepreneurial behavior and outcomes.

3. Research design and methods

The premise of our research is based McClelland's theory of achievement motivation, Rotter's theory of locus of control, and action regulation theory. Past literature reveals the association between self-efficacy and improvement towards individuals' attitude towards work. It enables new entrants to develop inclination in setting up new business venture (Yousaf et al., 2021). Khan et al. (2021) on a sample of women led SMEs in Pakistan find that the internal factors including the need for achievements, risk-taking, and self-confidence and external factors including economic factors and socio-cultural factors have a positive and significant influence on the success of women-owned enterprises. Seraj et al., (2022) on a sample of 220 small business entrepreneurs in Saudi Arabia using an online questionnaire find



Table 1. Overview of measuring scales of entrepreneurial traits, attitudes and values

Author	Year	Type of instrument	Entrepreneurial trait/ orientation/attitudes/ values
Rotter	1966	Internal – external scales (answers a/b)	Locus of control
Miller and Friesen	1982 1983	Questionnaire, Likert scales	They were among the pioneers in establishing measuring instruments for assessing risk propensity, innovation, and proactivity.
Covin and Slevin	1989 1990 1994	Questionnaire, Likert scales	Risk propensity, innovativeness, proactivity, competitive aggressiveness
Koh	1996	Questionnaire	Achievement propensity, locus of control, risk propensity, creativity, self-assurance, uncertainty tolerance
Richter	1999	Questionnaire, Likert scales	Autonomy, competitive aggressiveness, innovativeness, business success, risk propensity
Lumpkin and Dess	2001	Questionnaire, Likert scales	Proactivity, competitive aggressiveness
Zahra	2005	Questionnaire, Likert scales	Risk propensity in family firms
Wiklund and Shepherd	2005	Questionnaire, Likert scales	Innovativeness, risk propensity and proactivity
Monsen	2005	Questionnaire, Likert scales	Risk propensity, innovativeness, proactivity, autonomy
Rauch and Frese, Koenig and Wang	2006	Questionnaire, Likert scales	Innovativeness, risk propensity, proactivity
Fisher and Koch	2008	Questionnaire, Likert scales, primary data entry	Entrepreneurial values, attitudes, risk propensity
Miljković Krečar	2008	Questionnaire, Likert scales	Risk acceptance and unconventionality, focus on business success, confidence in one's abilities
Wagener et al.	2010	Questionnaire, Likert scales	Independence, risk propensity, uncertainty tolerance, self-efficiency, innovativeness and creativity, market orientation, leadership
Zellweger and Sieger	2010	Interview	Autonomy, innovativeness, ownership risk, proactivity, competitive aggressiveness
Bezzina	2010	Questionnaire, Likert scales	Achievement propensity, freedom, stress resilience, self-assurance, enthusiasm, innovativeness, locus of control, risk propensity
Stenholm et al.	2016	Questionnaire, Likert scales	Innovativeness, risk propensity – family firms
Hatak et al.	2016	Questionnaire	Innovativeness
Neupane, Bhattarai	2018	Delphi method, questionnaire	Life Philosophy, creating and utilizing mindset, supportive and motivating environment
Postigo et al.	2021	Questionnaire	Comparison of the “Big Five” and specific traits

Source: authors

that Entrepreneurial competency has a significant positive effect on Saudi SMEs' entrepreneurial resilience and sustainable performance. Badhghish et al. (2023), by using partial least squares, found

a significant positive influence of psychological factors—namely, perceived behavioral control, attitudes toward entrepreneurship, subjective norms, and entrepreneurial self-efficacy—on

the development and improvement of perceived entrepreneurial resourcefulness. Furthermore, demographic variables, such as family income, family background, family business experience, and exposure to entrepreneurship education, were found to contribute significantly and positively to individuals' perceptions of entrepreneurial resourcefulness.

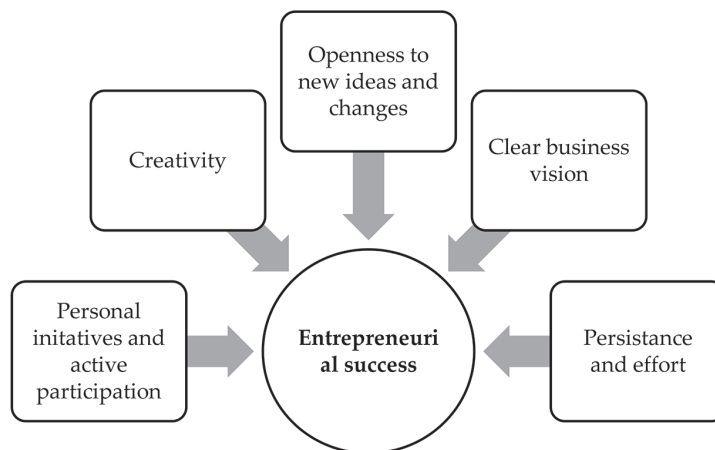
Following an extensive literature review, a study was conducted using a purposive sample of micro-companies operating for 1 to 5 years in Northwestern Croatia. The survey method was chosen as it best captures the psychological profile of successful entrepreneurs and provides a detailed description of their characteristics (traits) and key attitudes. An online survey questionnaire served as the research instrument, designed in accordance with theories related to entrepreneurial traits and aligned with the research objectives. The survey primarily consisted of multiple-choice questions, Likert scale questions ranging from 1 to 5, and an optional short-answer section. The questionnaire was organized into seventeen questions divided into two sections. The first set of questions examined the demographic characteristics of the respondents and the size of their companies, while questions three through fifteen assessed specific attitudes to determine the psychological profile and traits of successful entrepreneurs, as well as their perceptions of success. The questions on entrepreneurial traits covered aspects such as innovativeness, confidence, risk-taking, coping with challenges, the use of stress management techniques, business vision, organizational activities, introversion or extroversion, locus of control, perseverance, and openness to new ideas. The questionnaires were based on chosen constructs of other authors (see Table 1).

The research was conducted from March 7 to July 20, 2024. The data were collected using convenience sampling technique that has been used in many previous studies conducted in the domain of entrepreneurial intention and unearthed significant findings (Anwar et al., 2021). The surveys were sent out to email addresses of micro-entrepreneurs of various business activities from Northwestern Croatia according to the base of Financial agency. The research included entrepreneurs who were operating at least for 5 years, and have submitted financial reports for 2023. The purposive online sample included responses from 100 micro-entrepreneurs (fewer than 10 employees, with an annual net revenue of 900,000.00 Euros and total assets of 450,000.00 Euros, in accordance with the Accounting Law, Official Gazette 85/24) from Northwestern Croatia. The shortcoming of this research is visible in the small response rate. Entrepreneurs were reluctant to finish the survey even upon few sent notifications

The hypotheses will be tested using correlation analysis. Due to the potential issue of multicollinearity, Principal Component Analysis (PCA) will be employed to address the correlations between variables. The collected data were processed using SPSS software. The model was based on those of authors Leonelli et al. (2022) who conducted exploratory factor analysis (EFA) to extract the appropriate number of factors from the EO, resilience, and narcissism scales.

3.1. Research results

The questionnaire was completed by a total of 100 respondents. Male respondents accounted for 33% of the total sample, while female respondents made up 67%. Regarding age group classi-



Source: authors

Chart 2. Empirical model

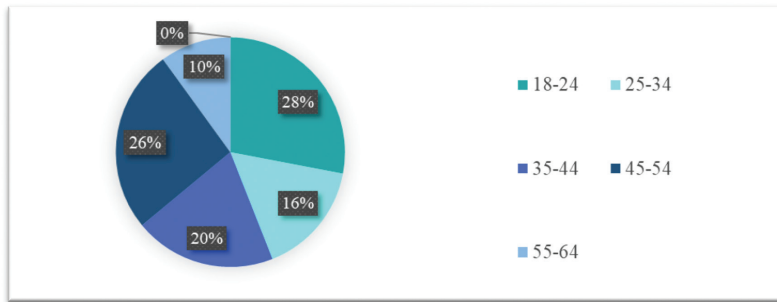


fication, the study involved several age groups, which were equally distributed as shown in Chart 1. The majority of respondents were in the 18–24 and 45–54 age groups.

Respondents were primarily from Međimurje and Varaždin Counties. The research was selective, focusing exclusively on micro-companies across various business sectors that had been operating for 1 to 5 years.

Following the descriptive analysis, the correlation matrix will be presented to examine how various entrepreneurial traits and entrepreneurial intentions are interconnected.

Based on the correlation matrix, it is evident that individuals who are more inclined to take risks tend to have a higher self-assessment of their ability to cope with challenges, as indicated by the correlation between Question 2 and Ques-



Source: authors

Chart 2. Age group of respondents

Table 2. Correlation matrix

To what extent do you consider confidence important in business management? (1)	1,000	0,306	0,222	0,315	0,159	0,183	-0,119	0,322	0,021	0,042	0,175	0,387	0,168	0,115
How inclined are you to take risks in your entrepreneurial venture? (2)	0,306	1,000	0,348	0,171	0,096	0,357	0,200	0,306	0,232	0,058	0,143	0,256	0,261	0,176
How do you assess your ability to face challenges and obstacles in entrepreneurship? (3)	0,222	0,348	1,000	0,274	0,169	0,345	0,417	0,198	0,387	-0,075	0,337	0,271	0,355	0,397
To what extent do you believe that your creativity is essential for innovation and the development of your business? (4)	0,315	0,171	0,274	1,000	0,142	0,402	0,235	0,247	0,074	-0,047	0,459	0,423	0,292	0,142
Do you utilize stress management strategies (e.g., positive thinking, relaxation, exercise, etc.) to maintain a high level of productivity? (5)	0,159	0,096	0,169	0,142	1,000	0,253	0,174	0,344	0,141	0,131	0,143	0,115	0,121	0,127



To what extent does your own business vision motivate you to work towards achieving business goals? (6)	0,183	0,357	0,345	0,402	0,253	1,000	0,334	0,270	0,301	0,130	0,351	0,459	0,386	0,183
How would you rate your ability to adapt to changes in the market? (7)	-0,119	0,200	0,417	0,235	0,174	0,334	1,000	0,237	0,377	-0,003	0,376	0,132	0,410	0,398
How inclined are you to plan and organize your activities? (8)	0,322	0,306	0,198	0,247	0,344	0,270	0,237	1,000	0,295	0,159	0,368	0,251	0,287	0,292
To what extent do you feel relaxed in group activities? (9)	0,021	0,232	0,387	0,074	0,141	0,301	0,377	0,295	1,000	0,039	0,217	0,130	0,285	0,547
How much do you believe that external factors such as luck and chance affect your business success? (10)	0,042	0,058	-0,075	-0,047	0,131	0,130	-0,003	0,159	0,039	1,000	0,038	0,037	-0,003	-0,072
To what extent do you believe that your personal initiative and active participation influence the success of your business? (11)	0,175	0,143	0,337	0,459	0,143	0,351	0,376	0,368	0,217	0,038	1,000	0,503	0,419	0,284
To what extent do you believe that persistence and effort can impact overcoming challenges in business? (12)	0,387	0,256	0,271	0,423	0,115	0,459	0,132	0,251	0,130	0,037	0,503	1,000	0,280	0,224
How would you describe your level of openness to new ideas and changes in business? (13)	0,168	0,261	0,355	0,292	0,121	0,386	0,410	0,287	0,285	-0,003	0,419	0,280	1,000	0,344
How would you describe your ability to stay present and focused during work tasks? (14)	0,115	0,176	0,397	0,142	0,127	0,183	0,398	0,292	0,547	-0,072	0,284	0,224	0,344	1,000

Source: authors

tion 3 (p -value = 0.73). Furthermore, the data suggests that creative individuals are more likely to employ stress management strategies compared to their less creative counterparts, as shown by the correlation between Question 4 and Question 5 (p -value = 0.67).

Regarding entrepreneurial motivation, individuals who are motivated by their personal business vision also tend to rate their ability to adapt to changes highly, as indicated by the correlation between Question 6 and Question 7 (p -value = 0.70). Furthermore, the data suggests that individ-



Table 3. VIF factors of entrepreneurial traits and characteristics

Question	VIF
To what extent do you consider confidence important in business management? (1)	98,31097
How inclined are you to take risks in your entrepreneurial venture? (2)	25,36229
How do you assess your ability to face challenges and obstacles in entrepreneurship? (3)	52,52466
To what extent do you believe that your creativity is essential for innovation and the development of your business? (4)	48,16877
Do you utilize stress management strategies (e.g., positive thinking, relaxation, exercise, etc.) to maintain a high level of productivity? (5)	15,87849
To what extent does your own business vision motivate you to work towards achieving business goals? (6)	54,84129
How would you rate your ability to adapt to changes in the market? (7)	45,51216
How inclined are you to plan and organize your activities? (8)	47,43938
To what extent do you feel relaxed in group activities? (9)	27,24831
How much do you believe that external factors such as luck and chance affect your business success? (10)	9,496419
To what extent do you believe that your personal initiative and active participation influence the success of your business? (11)	82,06793
To what extent do you believe that persistence and effort can impact overcoming challenges in business? (12)	130,5666
How would you describe your level of openness to new ideas and changes in business? (13)	50,70002
How would you describe your ability to stay present and focused during work tasks? (14)	55,93276

Source: authors

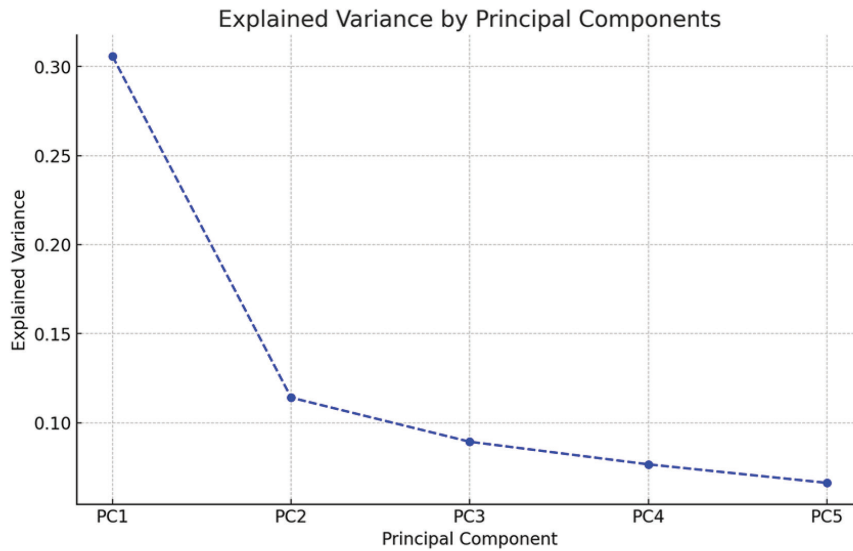
uals who feel relaxed in group activities are more likely to engage in planning and organizing their activities, as shown by the correlation between Question 9 and Question 8 (p -value = 0.70).

Multicollinearity of variables was also tested. The Variance Inflation Factor (VIF) analysis indicates that there is significant multicollinearity among the variables in the analysis. Generally, VIF values greater than 10 suggest severe multicollinearity, and some of the variables in this analysis have VIF values considerably higher than 10.

According to VIF factors there is an issue with multicollinearity with variables in the matrix, therefore the PCA transformation will be carried out to simplify a dataset by reducing its number of dimensions while preserving as much variance as possible. Firstly the covariance matrix of the standardized data will be computed. The covariance matrix captures the linear relationships between the variables. The eigenvalues and eigenvectors of the covariance matrix are respectively calculated. The eigenvalues indicate the amount of variance captured by each principal component, and the eigenvectors represent the direction of these components. These eigenvectors form the principal components, which are

new, orthogonal axes that capture the maximum variance in the data. The original data will be projected onto the new principal component axes to obtain the transformed dataset with reduced dimensions. The new dataset is a linear combination of the original variables. The explained variance will be evaluated to determine how much of the total variance in the data is captured by the selected principal components. This is calculated as the ratio of the sum of the selected eigenvalues to the sum of all eigenvalues. Loadings indicate how much each original variable contributes to a principal component.

PCA loadings are the coefficients of the original variables in the principal components. They provide insight into how much each original variable contributes to each principal component. The magnitude of a loading indicates the strength of the contribution of the variable to the principal component. A larger absolute value indicates a stronger influence. The sign (+/-) indicates the direction of the relationship. Variables with higher absolute loadings are more important in defining the principal component. The loadings can be interpreted as the correlation between the original variables and the principal components. The loadings can be organized in a matrix form, where



Source: authors

Chart 3. Analysis of the main components (PCA)

each row represents a principal component and each column represents a variable.

Five main components were obtained as presented in Chart 2, and descriptives in Table 4.

PC1 explains the largest portion of variability in the data. Together with PC2, these two components explain over 40% of the total variance. The first five principal components cumulatively account for 65.21% of the total variance in the data, indicating that they have preserved a substantial amount of the information from the original variables.

The first principal component (PC1) is the most significant among all components, as it explains the highest proportion of variability—30.57%. This indicates that PC1 is the most critical component for summarizing the information from the original variables.

Dominant Influence: PC1 carries the most information from the original data, meaning that the combination of variables forming PC1 best represents the overall variability in the dataset.

Dimensionality Reduction: By using PC1, we can significantly reduce the dimensionality of the data without losing too much information. This is particularly useful for visualization or further analysis.

Identification of Key Variables: The loadings (coefficients) of the variables for PC1 can help identify which variables contribute the most to this component. This can provide insight into the most important aspects of the data, such as business operations or characteristics that are most influential.

In Table 4 the loadings for PC1 are presented.

Table 4. PCA results

	PC1	PC2	PC3	PC4	PC5
count	100	100	100	100	100
mean	4,22E-17	4,44E-18	-1,1E-17	1,09E-16	5,66E-17
std	2,079233	1,270294	1,123991	1,041139	0,967907
min	-3,57895	-3,38696	-2,20079	-2,63949	-2,38003
25%	-1,5985	-0,88209	-0,84066	-0,64554	-0,51801
50%	-0,06928	-0,12213	-0,12607	-0,04831	-0,07814
75%	1,553051	0,972919	0,76439	0,523234	0,539523
max	6,120103	3,864925	2,528535	3,020187	2,998751

Source: authors



Table 5. PC1 loadings

Question	PC1
How much do you believe that external factors such as luck and chance affect your business success? (10)	-0,03281
Do you utilize stress management strategies (e.g., positive thinking, relaxation, exercise, etc.) to maintain a high level of productivity? (5)	-0,1734
To what extent do you consider confidence important in business management? (1)	-0,19425
How inclined are you to take risks in your entrepreneurial venture? (2)	-0,24525
To what extent do you feel relaxed in group activities? (9)	-0,26338
To what extent do you believe that your creativity is essential for innovation and the development of your business? (4)	-0,27452
How would you describe your ability to stay present and focused during work tasks? (14)	-0,27774
How would you rate your ability to adapt to changes in the market? (7)	-0,28161
How inclined are you to plan and organize your activities? (8)	-0,2827
To what extent do you believe that persistence and effort can impact overcoming challenges in business? (12)	-0,29355
How would you describe your level of openness to new ideas and changes in business? (13)	-0,31062
How do you assess your ability to face challenges and obstacles in entrepreneurship? (3)	-0,31296
To what extent does your own business vision motivate you to work towards achieving business goals? (6)	-0,32278
To what extent do you believe that your personal initiative and active participation influence the success of your business? (11)	-0,32419

Source: authors

In this Principal Component 1 (PC1) in Table 5, various factors are analyzed and how they relate to the first principal component, which captures the largest portion of the variability in the dataset. Each factor (variable) is represented by a question, and the corresponding value shows the loading or contribution of that factor to PC1. These loadings help identify the underlying dimension that PC1 represents.

The factor loadings are all negative, indicating that as one or more of these variables increase, the value of PC1 tends to decrease. The larger (in absolute value) the loading for a particular variable, the stronger its influence on the interpretation of PC1.

Based on the factor loadings in the PC1 table, we can interpret PC1 as a component that likely reflects an overarching concept of personal control, self-management, and proactive behavior in entrepreneurship. Here's why:

Personal initiative and active participation (Q11) has one of the largest negative loadings (-0.32419). This suggests that individuals who perceive personal initiative and active involvement as critical

to their business success tend to score highly on this component.

Business vision as motivation (Q6) also has a strong negative loading (-0.32278), indicating the importance of having a clear business vision as a motivational factor for driving success.

Openness to new ideas and adaptability to changes (Q13, Q7) contribute significantly to PC1. These questions (-0.31062 and -0.28161, respectively) suggest that this component is also linked to how open and adaptable an individual is to new ideas and market changes.

Persistence and effort to overcome challenges (Q12) and creativity for innovation (Q4) further support the idea that PC1 is capturing entrepreneurial resilience and innovation-driven behaviors.

Risk-taking (Q2) and confidence in business leadership (Q1) also load onto this component, albeit with slightly lower contributions, implying that entrepreneurial confidence and risk propensity are additional dimensions that contribute to this factor.



In summary, the factor represented by PC1 can be interpreted as proactivity, adaptability, and self-driven leadership in entrepreneurial contexts. Those who score highly on this component are likely characterized by strong personal initiative, focus on their business vision, openness to change, and the belief that effort and creativity drive success. Conversely, the negative loadings suggest that individuals who downplay the importance of these traits may score lower on this dimension.

The loadings across all questions imply that PC1 encapsulates how individuals manage themselves and their business in dynamic environments, particularly focusing on adaptability, initiative, and personal motivation.

Furthermore, we will test the hypotheses set in the paper.

Hypothesis 1: Personal initiative and active participation significantly contribute to entrepreneurial success.

The variable “To what extent do you believe that your personal initiative and active participation influence the success of your business?” has the highest contribution to the first principal component (PC1). The hypothesis is accepted. Personal initiative and active participation are key factors for success in entrepreneurship, according to this analysis.

Hypothesis 2: Creativity is essential for innovation and business development. The variable “To what extent do you believe that your creativity is crucial for innovation and the development of your business?” shows a significant contribution to the principal components. The hypothesis is accepted. Creativity is an important factor for innovation and business development.

Hypothesis 3: Openness to new ideas and changes positively influences business success. The variable “How would you describe your level of openness to new ideas and changes in business?” has a strong contribution to PC1. The hypothesis is accepted. Openness to new ideas and changes positively influences business success.

Hypothesis 4: Persistence and effort are crucial for overcoming challenges in business. The variable “To what extent do you believe that persistence and effort can influence overcoming challenges in business?” also contributes significantly to PC1. The hypothesis is accepted. Persistence and effort are essential for overcoming business challenges.

Hypothesis 5: A clear business vision motivates entrepreneurs to achieve business goals. The

variable “To what extent does your own business vision motivate you to work towards achieving business goals?” significantly contributes to PC1. The hypothesis is accepted. Business vision is an important motivational factor for entrepreneurs.

All proposed hypotheses are supported by the results of the PCA analysis. The first principal components reveal that personal initiative, creativity, openness to change, persistence, and business vision are key factors contributing to entrepreneurial success. These factors play a crucial role in business operations and can help shape strategies for successful business management.

3.2. Discussion of research results

The findings of this research provide a nuanced understanding of the entrepreneurial traits that significantly impact perceptions of entrepreneurial success, focusing on micro-entrepreneurs in Northwestern Croatia. The analysis underscores the pivotal role of personal initiative, creativity, persistence, openness to new ideas, and a clear business vision in fostering entrepreneurial achievement. These results align with and expand upon existing theories of entrepreneurial psychology and behavior.

The analysis highlights personal initiative as a critical determinant of entrepreneurial success. As hypothesized, individuals who actively engage in their business processes and exhibit self-starting behaviors demonstrate superior outcomes. This aligns with Frese and Zapf’s (1994) Action Regulation Theory, which emphasizes the importance of proactive and goal-directed behaviors in achieving business objectives. The high loading of personal initiative on the first principal component (PC1) affirms its centrality in the entrepreneurial framework.

Creativity emerged as an essential factor for innovation and business development, supporting McClelland’s (1961) emphasis on achievement-oriented behavior. Entrepreneurs who value creativity are better equipped to generate novel solutions, adapt to dynamic market conditions, and differentiate their ventures. This finding aligns with prior studies indicating that creativity drives innovation, which is a critical factor in maintaining competitiveness (Bosma & Sanders, 2017).

The research demonstrates a strong relationship between openness to new ideas and business success. Entrepreneurs who embrace change and seek new opportunities tend to perform better, as reflected in the significant contribution of this trait to PC1. This finding corroborates the Entre-



preneurial Personality System (Obschonka & Stuetzer, 2017), which emphasizes adaptability as a core entrepreneurial characteristic. Such openness allows entrepreneurs to navigate uncertainties and capitalize on emerging trends.

Persistence and sustained effort were shown to be vital for overcoming business challenges, confirming the hypothesis. Entrepreneurs who maintain resilience and dedication in the face of obstacles are more likely to achieve their goals. This aligns with previous studies by Rauch and Frese (2007), which identify persistence as a key predictor of entrepreneurial success. The high factor loading of persistence on PC1 further validates its importance.

A clear business vision was identified as a significant motivational factor, reinforcing its role in driving strategic decision-making and goal achievement. Entrepreneurs with well-defined visions are better equipped to align their activities with long-term objectives, a finding consistent with Carver and Scheier's (1982) control theory. This result highlights the importance of strategic clarity in fostering entrepreneurial success.

The results also emphasize the interconnectedness of entrepreneurial traits. For instance, the correlation analysis revealed that entrepreneurs who prioritize creativity are more likely to employ stress management strategies, and those motivated by a clear business vision exhibit higher adaptability. These relationships underscore the multifaceted nature of entrepreneurial success and the importance of a holistic approach to trait development.

3.3. Research limitations and recommendations for further research

One of the main limitations of this research lies in the sample size and its geographic focus. The study was conducted with a relatively small sample of 100 entrepreneurs from Northwestern Croatia, which may limit the generalizability of the findings to broader populations or different geographic regions. Additionally, the study focused exclusively on micro-companies, which may not fully capture the entrepreneurial dynamics present in larger businesses or other sectors. Another limitation is the reliance on self-reported data. The use of surveys to assess psychological traits and entrepreneurial perceptions is inherently subjective and may lead to bias, such as social desirability bias, where respondents answer in ways they believe are socially acceptable rather than providing entirely truthful responses. The

Principal Component Analysis (PCA) used in the study reduced multicollinearity and identified key components; however, this method does not fully address causality. While correlations between entrepreneurial traits and success are evident, this approach does not definitively demonstrate a causal relationship between these variables.

Future studies should consider expanding the sample size and geographic scope to include entrepreneurs from different regions and industries. This would help ensure the findings are more representative of diverse entrepreneurial environments and increase the external validity of the results. Longitudinal research is recommended to better understand how entrepreneurial traits evolve over time and how these traits influence long-term business success. Tracking entrepreneurs over several years would provide more robust insights into the causal relationships between personality traits and business outcomes. Further research should also consider using a combination of qualitative and quantitative methods. Incorporating in-depth interviews or case studies alongside survey data could provide richer, more nuanced insights into the psychological factors that drive entrepreneurial success. Additionally, using objective business performance metrics, rather than solely relying on self-reported measures, could reduce potential biases.

4. Conclusion

This study set out to investigate the impact of entrepreneurial traits on perceptions of success among micro-entrepreneurs in Northwestern Croatia. The main goal was to identify and evaluate the key psychological traits that contribute to entrepreneurial success and to examine their interplay within the business context. Through the use of a structured questionnaire and statistical analysis, the research identified five critical traits: personal initiative, creativity, persistence, openness to new ideas, and a clear business vision. These traits were shown to have significant influence on entrepreneurial outcomes, supporting the hypotheses that proactive and innovative behaviors drive success.

The findings emphasize the importance of personal initiative and persistence in overcoming challenges, creativity as a driver of innovation, and openness to adaptation in dynamic markets. Furthermore, a clear business vision emerged as a powerful motivational tool that aligns strategic goals with entrepreneurial actions. These results



underscore the multifaceted nature of entrepreneurial success, highlighting how individual traits interact to shape business performance.

Recommendations for future research include expanding the sample size and geographic scope to enhance the generalizability of the findings. Longitudinal studies could provide deeper insights into the long-term impact of entrepreneurial traits and how they evolve over time. Additionally, incorporating mixed methods, such as qualitative interviews and objective performance metrics, could offer a more comprehensive understanding of the factors influencing entrepreneurial success. By addressing these areas, future studies can build on the current findings and contribute further to the field of entrepreneurial research.

In summary, this study provides valuable insights into the psychological profiles of successful entrepreneurs and offers practical recommendations for fostering entrepreneurial development. By recognizing and nurturing these traits, policymakers, educators, and business support organizations can create an environment that promotes sustainable entrepreneurial success. In conclusion, the findings affirm the hypotheses and contribute to a deeper understanding of the psychological underpinnings of entrepreneurial success. By identifying and fostering these key traits, stakeholders can better support entrepreneurs in achieving sustainable business growth.

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