



The Beneficial Differentiation within Entrepreneurship of Self-Employed, Business Owner and Entrepreneur

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The beneficial differentiation within entrepreneurship of self-employed, business owner and entrepreneur

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Abstract

This study explores the diversity among entrepreneurs to identify the innate factors behind the variation. The intention is to explain why some entrepreneurs prefer to be self-employed in one-person businesses, while others build enterprises with numerous employees. A factor analysis of the personality traits of active entrepreneurs reveals nine entrepreneurial factor types, which are further subjected to psychological analysis. Based on leadership, innovation, social and efficiency skills, the psychological interpretation reveals three categories in entrepreneurship: the self-employed, the business owner and the entrepreneur. The categories exhibit inherent dissimilarities and similarities that clearly explain the discrepancies in entrepreneurs' preferences on a profoundly personal level. The concept of entrepreneur, commonly used to refer to a variety of individuals, accurately describes only one category. Instead, the concepts of self-employed and business owner better explain the related activity and outcomes of the other two categories. Accordingly, the results suggest that the quality of support, expected outcomes and consequently socio-economic growth will improve with a thorough consideration by authorities of each individual's personality or at least by consideration of which category best describes the target group of, for example, teaching and financial support.

Keywords

Business owner, entrepreneurial types, entrepreneur, factor analysis, personality traits, self-employed

Entrepreneurial growth is currently among the goals of many countries (Davidsson et al., 2002; Wennekers and Thurik, 1999). However, policymakers, supporters and practitioners face several obstacles in ensuring consistent entrepreneurial growth. One major issue is the diversity among entrepreneurs, reflected in their businesses activities and outcomes. Entrepreneurship scholars in various fields also adopt diverse approaches depending on their educational backgrounds and affiliations. In general, the entrepreneurship field has evolved in a seemingly random way along two separate avenues. First, it has emerged as an academic discipline, in which scholars working in their particular subfields have focused on enterprises' opportunities, production and characteristics in relation to the concepts used to describe them. Second, the entrepreneurship field has evolved as a theoretical discipline, borrowing, building on and adapting conceptual work from fields such as management, finance, marketing, organizational behaviour, psychology and sociology.

This article suggests that a beneficial way forward is to integrate knowledge based on active entrepreneurs,

preferably gathered using psychological approaches (Davidsson, 2016; Hisrich et al., 2007). In a theoretical context, such knowledge should provide a renewed view of what, why and how entrepreneurs succeed in their practice – in contrast to, for instance, knowledge collected from entrepreneurial students or databases of self-reported scores for a few simple questions. Additionally, it is well-known that entrepreneurs' success is related to different factors (Alstete, 2008; Østergaard, 2003) – among others, deliberate practice (Keith et al., 2016), human capital (Østergaard and Marinova, 2018; Unger et al., 2011) and well-being (Østergaard et al., 2018). An in-depth, empirical investigation of the diverse types of active entrepreneurs and their innate personalities and characteristics is expected to shed light on the relationship between

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entrepreneurial types and their preferred firm type and to provide a renewed theoretical framing for economic growth (Carree and Thurik, 2003; Kuratko et al., 2015).

Accordingly, in this article, the economic growth related to entrepreneurship is seen as a highly assorted measure; for instance, as new products, enterprises and services in one case and as a steadily increasing number of employees in another. Neither outcome is unwanted, but they are very unlikely to affect society very differently and therefore need further examination. This explorative investigation, therefore, is expected to make two contributions. First, the study should increase policymakers' ability to target strategic decision-making regarding venture growth based on significant empirical research (e.g. Baum and Locke, 2004; Baum et al., 2001; Wright et al., 2015). Second, the study advances the academic discussion about entrepreneurial types and provides a stepping stone for future research.

This article addresses the lack of a sustainable definition of an entrepreneur (e.g. Gartner, 1994). The vague definitions are an ongoing problem related to the broad variations within entrepreneurship, but the unity of the entrepreneurship research field could increase if the phenomenon were approached theoretically and empirically (Wiklund et al., 2011). Accordingly, scholars may investigate in more detail partial issues, such as describing the owners of growth-oriented firms (Carland et al., 2002), identifying business owners (Carter and Shaw, 2006) and providing evidence for the significance of leadership (Cogliser and Brigham, 2004; Smith et al., 2017). More notably, scholars may investigate in detail the characteristics of an individual entrepreneur (e.g. Gartner, 1988; Hisrich et al., 2007; Wiklund et al., 2003). The considerations of such investigation are further addressed in this study.

In the next section, the research method and approach, based on a traditional personality measurement and factor analysis, are explained. Then, the findings from a psychological interpretation are presented in an explorative progression, resulting in three propositions. Finally, the findings are further discussed in the concluding remarks.

Method and research approach

The aims of this explorative investigation are to fill the knowledge gap concerning the differences among entrepreneurs and to provide a foundation for further research through a psychological interpretation of the innate characteristics of entrepreneurs. This explorative, inductive psychological analysis yields three related propositions about the stable personality characteristics of entrepreneurs, which future entrepreneurship researchers might advance theoretically.

Moreover, this research supports the literature finding that innate skills influence entrepreneurial behaviour, thereby leading to entrepreneurial venture growth. However, the study also does not neglect the influence of the

social environment. The discussion is not about either but, rather, both (Carland et al., 2002). The focus is on the personality traits of active entrepreneurs, and especially how knowledge about these can enhance the quality of entrepreneurship policy and the teaching and training of future entrepreneurs.

In general, since Gartner (1988) asked 'Who is an entrepreneur?' and catalysed a paradigm shift in academia, scholars have left behind the personality focus of the 1960s dominated by scholars such as McClelland (1967, 1987). Over the last decades, a view of the entrepreneur as influenced by society (e.g. Chell, 2008; Chell et al., 1991) has dominated the academic discussion. For example, scholars have investigated how networking influences entrepreneurship (Klyver et al., 2007) and the issues of human, social and financial capital in relation to entrepreneurs (e.g. Carter et al., 2003; Davidsson and Honig, 2003; Shaw and Carter, 2007). However, a broader view of entrepreneurial personalities has emerged from scholars with a psychological background. For instance, Rauch and Frese (2007), on the basis of a large-scale literature review, propose that scholars should focus on knowledge, skills and ability. Multiple foci for entrepreneurial types have been observed, such as the four types of entrepreneurs in Wennekers and Thurik's (1999) matrix. Scholars have typically measured entrepreneurs' personalities using the 60 (or fewer) questions correlated to specific traits from the Big Five personality test, which has become a gold standard. Developed by Costa and McCrae (e.g. 1990, 1992; McCrae and Costa, 1997), the original test, the Neuroticism–Extraversion–Openness Inventory) from 1978, had 240 items, both self-reported and observations. However, Internet access has made problematic the psychological standard that the respondents should not know the questions in advance. This threatens the validity of the results, making them potentially exaggerated at best and misleading at worst. Hence a less known, but standardized personality test is used for this survey.

Additionally, many tend to believe that the entrepreneurial mindset is extreme, although it is not. The paramount issue in the entrepreneurial personality is the exact combination of traits (Østergaard, 2017). Mapping a full personality to thoroughly analyse diverse aspects of an individual's potential is equivalent to the starting point of most personality tests, which were developed as psychological tools to fully understand the consequences of brain damage that soldiers experienced during the Second World War. A full personality test takes into account the dark side (Mason, 2005; McGrath, 2003) and the skills that are significant characteristics of an entrepreneur, such as a negative relation to social maturity and adaptation capacity. A negative relationship to these traits characterizes an individual who claims the right to be impulsive, express emotions and behave in a way contrary to the expected social norms.

Data collection and limitations

This explorative research study of the personality traits of 55 established entrepreneurs used the Panastell Advanced Personality Aptitudes test (PAPA test), a standardized personality test taking into account the whole personality. The raw personality trait scores were subjected to factor analysis and were interpreted psychologically. The empirical investigation captured data from active entrepreneurs and in-depth knowledge through psychological methods.

The personality test was a psychometric inventory test with 480 items formed as statements. It covered the whole personality by outlining 52 variables: four basic aptitudes, 12 functional categories and 36 personality traits. The test measured personal potential in the four aptitudes: leadership, innovation, effectiveness and social potential. From these aptitudes emerged 12 functional categories (three for each aptitude): change management, motivation management, efficiency management, growth, power, vitality, stability, integrity, analytical capacity, interaction, cooperation and integration. Each functional category consisted of three personality traits.

The survey was conducted electronically with a cohort of established entrepreneurs, who differed in their educational and vocational backgrounds and the age, size and type of their businesses. This was paradoxically both an advantage and a limitation. The limitation was straightforward: the survey did not meet the demand for a prior identification of the cohort as real entrepreneurs. However, a clear, consensual definition of an entrepreneur does not yet exist. The advantage was similarly straightforward: a diverse cohort increased the value of factor analysis, especially when the cohort was also framed by a unifying identification; in this case, being an entrepreneur. Consequently, the data from the factor analysis revealed significant (new) types in the unifying sample.

The validity of the results was verified through standardization with a test built on Svalastoga's (1959) five stratifications. However, reliability should be further confirmed through measurement of various cohorts, preferably cross-cultural cohorts. Then, accurate global entrepreneurial factor types would be available in academia.

Factor analysis of entrepreneurial data revealing entrepreneurial types

The collected data on 55 entrepreneurs' personality traits were processed through factor analysis. Following Anastasi (1988), factor analysis served to group personality inventory items into relatively homogeneous and independent clusters, contributing to the construction of definitions and permitting the effective combination of scores to predict specific criteria. Higher than the minimum of 50 cases (Howitt and Cramer, 2014), this survey of 55 entrepreneurs was sufficient, as a sample size of 50 'was shown to be the

minimum to yield a clear, recognizable factor pattern' (Arrindell and Van der Ende, 1985: 167).

For 30 years (1928–1959), Thurstone investigated the psychological implications of factor analysis. He found that the base line of the frequency distribution was highly important:

The base line represents ideally the whole range of opinions from those at one end who are most strongly in favor of the issue to those at the other end of the scale who are as strongly against it. Somewhere between the two extremes on the base line will be a neutral zone representing indifferent attitudes on the issue in question. The ordinates of the frequency distribution will represent the relative popularity of each attitude. (Thurstone, 1928: 529)

In this research, the issue investigated was entrepreneurs.

Accordingly, the factor analysis of the raw personality test score was performed through a principal axes analysis from the survey of active entrepreneurs who completed the personality test (PAPA) with Kaiser–Meyer–Olkin (KMO) scores higher than 0.60. The clearest structure was found with an Oblimin rotation with Kaiser normalization, in which 9 of the 36 factors demonstrated an eigenvalue higher than 1. The factor analysis returned a KMO of 0.7 (KMO = 0.685; Bartlett's test of sphericity = 1255.85; cumulative explained variance of 9 factors = 80%). Regarding significance, the factor analysis yielded a KMO of 0.7, demonstrating an acceptable overall correlation with substantial factors accounting for 80% of the reliability variance. Generally, 50 observations with a correlation of 0.722 are significant (Field, 2013; Stevens, 2012); therefore, the survey results confirmed the validity of the associated psychological interpretation of the entrepreneurial personality.

Valuable, diverse data on all nine factors, therefore, were available for further investigation as separate types within the overall entrepreneurship framework. Through an explorative process, the nine significant factors in entrepreneur types were psychologically analysed to develop a systematic classification of personality traits differentiating entrepreneurs. This marked the study's contribution to the academic discussion.

Findings

Overall, the findings largely support previous research from the psychological path in entrepreneurship research. The findings are organized following the explorative process of the psychological interpretation of the factor types. The process, accomplished in three waves, gives rise to three propositions.

This explorative investigation takes as its point of departure the belief that well-performing entrepreneurs are highly appreciated in society. Consequently, an attempt

Table 1. Factor correlation matrix of entrepreneurial personality traits.

Factor	1	2	3	4	5	6	7	8	9
1	1.000	-0.088	-0.225	0.226	-0.241	0.010	0.208	0.222	-0.342
2	-0.088	1.000	-0.235	0.310	0.207	-0.313	-0.098	-0.192	-0.024
3	-0.225	-0.235	1.000	-0.343	0.010	0.067	-0.043	0.089	-0.010
4	0.226	0.310	-0.343	1.000	-0.001	-0.229	-0.130	0.067	-0.117
5	-0.241	0.207	0.010	-0.001	1.000	-0.130	-0.229	-0.187	0.190
6	0.010	-0.313	0.067	-0.229	-0.130	1.000	0.163	0.000	0.136
7	0.208	-0.098	-0.043	-0.130	-0.229	0.163	1.000	0.008	-0.062
8	0.222	-0.192	0.089	0.067	-0.187	0.000	0.008	1.000	-0.379
9	-0.342	-0.024	-0.010	-0.117	0.190	0.136	-0.062	-0.379	1.000

Note: Extraction method: principal axis factoring; rotation method: Oblimin with Kaiser normalization.

Source: The Østergaard Personality Survey.

to rank or select entrepreneurs based on their entrepreneurial ability should be highly valued. However, Thurstone further explains,

The true allocation of an individual to a position on an attitude scale is an abstraction, just as the true length of a chalk line, or the true temperature of a room, or the true spelling ability of a child, is an abstraction. (Thurstone, 1928: 530)

In this case, the abstraction is the value of different types of entrepreneurial activity caused by predisposing innate personality traits. This argues against using only linear ranking of entrepreneurs and supports more in-depth scrutiny of the traits of each factor type to understand their true value.

The necessary distinction of entrepreneurs

First, following Thurstone’s (1928) baseline, the measured attributes are represented on a linear continuum limited to comparing individuals according to whether they have more or less of a type: in this case, whether they are more or less entrepreneurial. Factor type 1 is the most entrepreneurial type, while factor type 9 is the least entrepreneurial. However, the main findings display nine, at this point rather anonymous factor types, and of these the first two, with especially high eigenvalues (9.674 and 7.636), compose uneven traits that characterize the types (see Table 1). In other words, two apparently incongruent types are equally typical entrepreneurs. Thereby, the analysis lives up to Thurstone’s (1948) findings and supports his statement that occasionally encouraging results appear.

Factor analysis enables the investigation of psychological ideas, so the interpretations are consequently as subjective as in any other scientific work, even if the factorial results are clear and clean.

A factorial study is more likely to give convincing findings if it covers a restricted domain with only enough measures of known factorial composition to serve as a linkage between the

factors that are already known and the factors that we hope to discover or isolate. (Thurstone, 1948: 402)

As a scientific method, factor analysis therefore should isolate the personality traits of entrepreneurs and, through psychological interpretation, link the nine factor types to known entrepreneurial activity.

Accordingly, the following is proposed:

Proposition 1: Good and poor entrepreneurs exist, but the scale on which to measure entrepreneurs is not linear. In reality, entrepreneurial diversity relates to the variation of personality traits – a variation which is valuable for many purposes.

Diverse directions of entrepreneurial activity

Ranking entrepreneurs on a base line from good to poor fails to describe the diversity among them (e.g. Gorgievski and Stephan, 2016; Miller, 2015). However, the two first factor types, presumably the best-performing entrepreneurs, exhibit eigenvalues of 9.674 and 7.636, in contrast to factor 3, with an eigenvalue of 3.380. Additionally, factor 9 displays an eigenvalue of 1.020 and is assumed to be the least entrepreneurial type. The two strongest, independent factor types, therefore, indicate that we are dealing with at least two different directions of entrepreneurial activity, and each exhibits significant personality traits related to its preferred behavioural performance.

The next step in the explorative analysis is to find patterns in the mutual relationships among the nine factors through a factor correlation matrix (see Table 1). Table 1 displays the factor correlation matrix extracted using principal component analysis and cleared out by an Oblimin rotation with Kaiser normalization indicating the relationships between the nine factor types.

Factor 1 has the highest correspondence with factor 4 (0.226), followed by factor 8 (0.222) and factor 7 (0.208). Factor 1, therefore, is almost equally related to factors 4, 7 and 8. In contrast, factor 1 is in opposition to factor 9 (-0.342), factor 5 (-0.241), factor 3 (-0.225) and factor

2 (−0.088). Factor 2 corresponds with factor 4 (0.310) and factor 5 (0.207) and has a negative correlation with factor 3 (−0.235), factor 6 (−0.313), factor 8 (−0.192) and factor 1 (−0.088).

Nevertheless, it is expected that all nine factors will possess valuable and diverse information as separate factor types within the category of entrepreneurs. From factors 1 and 2 emerges a pattern indicating two different groups of entrepreneurial types. However, both groups are connected to factor 4 and are in opposition to factor 3; therefore, factor 3 is not typically entrepreneurial. Thus, within entrepreneurship, there are two groups of entrepreneurial types based on either factor 1 or factor 2. The first group consists of factors 1, 4, 7 and 8, and the second group of factors 2, 4 and 5. The negatively related factor types reveal that factor 3, as well as 9 and 6, should be excluded from the two groups of typical entrepreneurs.

Overall, the factor correlation matrix reveals at least two groups of entrepreneurs, supporting Wiklund et al. (2011: 9) in their reflection on the problematic equation of self-employment with entrepreneurship emphasized by Carter (2011). Furthermore, non-entrepreneurial factor types are identified. Hence, the following proposition emerges:

Proposition 2: The entrepreneurial types form at least two different, independent groups. Within each group or category, the factor types exhibit profound similarities in disposition. The psychological interpretation of the personality traits involved in each factor type is highly likely also to describe the differences in the categories.

Personality traits of entrepreneurs to predict growth variation

The next step in the explorative analysis is to integrate the substantial elements, outline the personality traits for each factor type and undertake a psychological interpretation of each factor-type profile. First, the personality traits related to the nine selected factors are outlined in a structure matrix in Table 2. A remarkable number of traits have negative values, meaning that the person corresponding to the factor type dislikes a specific related behaviour. Next, each factor type is psychologically interpreted based on the positive and negative values of the 36 personality traits.

The structure matrix in Table 2, made through principal axes analysis and an Oblimin rotation with Kaiser normalization between the nine factor types and the 36 measured personality traits of the active entrepreneurs (Cronbach's $\alpha = 0.928$), yields the values of all traits for each of the nine factors. A negative value means that a factor type conflicts with a trait. In a remarkably clear result, factor 9 has only six weak positive relationships, confirming that it is a non-entrepreneurial type. Hence, it is argued that the negative related personality traits must be taken into account,

underlining the argument for measuring the full personality. Moreover, the findings support the view of Valencia-deLara and Araque-Hontangas (2012) that personality characteristics and entrepreneurs' attitudes should be considered to be complementary, not opposites, contributing to more generally predictable circumstantial and temporal behaviour.

The psychological interpretation allows labelling of the factor types:

- Factor 1: Synnovation creator
- Factor 2: Administrator
- Factor 3: Desperate survivor
- Factor 4: Team organizer
- Factor 5: Bag carrier
- Factor 6: Opportunist
- Factor 7: Rebel
- Factor 8: Adventurer
- Factor 9: Routinized employee

Previously, factors 3, 6 and 9 were excluded from the core entrepreneurial concept. The psychological interpretation confirms this decision. For example, the survivor type (factor 3) indicates that entrepreneurs are capable of overcoming hardship, which in itself is interesting but gives no additional information about how entrepreneurs perform well. The same is true regarding the opportunistic type (factor 6), which is often seen in consulting agencies claiming they can triumph over all the world's challenges. In reality, they are not capable of conducting much due to, for example, the lack of endurance seen in the negative trait target drive. Finally, the archetype of an employee (factor 9) is in direct opposition to the entrepreneur, in agreement with Thurstone's (1928) base line. The knowledge learned from factors 3, 6 and 9, therefore, helps to sort out the low-performing entrepreneurial types.

The psychological interpretation of factors 1, 2, 4, 5, 7 and 8 also conveys substantial insights. Factor 5 is in direct opposition to the other factors apart from factor 2, so an analysis of factors 1, 2, 4, 7 and 8 likely indicates the most significant personality traits of well-performing entrepreneurs. Among these five factor types, the personality trait of willingness to delegate occurs four times, and the traits of dominance, passion and self-confidence occur three times. The traits of achievement instinct, autonomy, care, dynamism, exploration drive, initiative, need for contact, personal manifestation, willingness to take risks, self-preservation instinct, stress tolerance, urge to rebel and vigour occur twice.

The similarities of entrepreneurial characteristics in the factor types are obvious due to the overlap on the trait level, even though it is not complete. However, the overlap increases and forms a pattern when comparing the functional categories (each with three traits) and the overall attributes (each with three functional categories). The four attributes of leadership, innovation, effectiveness and

Table 2. Structure matrix of 36 entrepreneurial personality traits in relation to nine factor types.

Personality traits	Factor type								
	1	2	3	4	5	6	7	8	9
Initiative	0.635	-0.280	0.031	0.214	-0.493	-0.049	0.048	0.512	-0.655
Risk willingness	0.242	-0.440	0.114	-0.420	-0.472	0.391	0.375	0.505	-0.169
Creative drive	0.213	-0.745	0.276	-0.221	-0.341	0.357	0.044	0.494	-0.317
Willingness to delegate	0.667	0.347	-0.344	0.344	-0.123	-0.082	0.179	0.084	-0.405
Passion	0.669	0.176	-0.387	0.530	-0.232	-0.252	0.045	0.318	-0.636
Dominance	0.785	-0.075	-0.229	0.296	-0.537	-0.015	0.382	0.310	-0.559
Target drive	0.295	0.702	-0.409	0.484	0.159	-0.361	0.194	-0.165	-0.220
Achievement instinct	0.454	-0.051	-0.062	0.161	-0.254	-0.162	0.087	0.356	-0.867
Decision-making ability	0.222	-0.166	-0.031	-0.048	-0.390	0.107	0.760	0.214	-0.261
Flexibility	-0.036	-0.370	0.131	-0.219	-0.100	0.766	0.003	0.126	-0.056
Social dependence	-0.018	0.168	-0.028	0.098	0.801	-0.144	-0.217	0.025	-0.032
Adaption capacity	-0.454	0.130	0.186	-0.257	0.663	-0.001	-0.157	-0.275	0.223
Tolerance	0.045	-0.106	-0.206	-0.035	-0.094	0.594	0.212	-0.068	0.262
Social maturity	0.215	0.238	-0.307	0.742	-0.102	0.084	-0.023	-0.041	0.117
Democratic attitude	0.223	0.266	-0.373	0.742	0.131	-0.264	-0.254	0.248	-0.178
Care	0.303	0.231	-0.263	0.740	-0.120	-0.397	-0.234	0.274	-0.429
Responsibility	0.071	0.363	-0.289	0.883	0.036	-0.301	-0.040	-0.060	-0.089
Willingness to integrate	0.602	0.074	-0.483	0.625	0.065	-0.417	-0.084	0.217	-0.273
Exploration drive	0.358	-0.184	-0.014	0.146	-0.202	0.049	0.095	0.803	-0.500
Preparedness for change	0.237	-0.271	0.276	-0.060	-0.222	0.192	-0.032	0.629	-0.649
Experience of well-being	0.371	0.024	-0.732	0.292	-0.172	0.110	0.213	0.095	-0.197
Vigour	0.544	-0.111	0.018	0.145	-0.396	-0.022	0.290	0.492	-0.759
Urge to rebel	0.138	-0.177	0.476	-0.237	-0.202	0.064	0.345	0.614	-0.393
Self-preservation instinct	0.325	-0.017	-0.004	-0.047	-0.082	-0.073	0.122	0.393	-0.753
Need for contact	0.873	-0.267	-0.292	0.085	-0.328	0.031	0.252	0.344	-0.206
Dynamism	0.386	-0.278	0.211	0.095	-0.183	-0.077	-0.141	0.629	-0.476
Personal manifestation	0.712	0.224	-0.181	0.380	-0.311	-0.087	0.126	0.269	-0.637
Self-control	-0.033	0.475	-0.698	0.244	0.294	-0.182	-0.129	-0.559	0.163
Objectivity	-0.028	0.889	-0.253	0.385	0.246	-0.300	-0.318	-0.169	-0.063
Structuring capacity	-0.117	0.821	-0.203	0.404	0.450	-0.410	-0.100	-0.179	0.207
Stress tolerance	0.396	0.268	-0.797	0.330	-0.146	0.028	0.132	-0.164	-0.129
Self-confidence	0.553	0.011	-0.521	0.239	-0.385	-0.089	0.374	0.318	-0.332
Autonomy	0.187	0.296	-0.276	0.358	-0.097	-0.321	0.141	0.307	-0.726
Empathy	-0.122	0.372	-0.569	0.431	0.214	-0.249	-0.340	0.111	0.191
Systematic mindedness	-0.198	0.647	-0.164	0.212	0.076	-0.557	-0.328	-0.029	-0.202
Reflectiveness	-0.193	0.511	-0.030	0.369	0.110	-0.427	-0.556	0.203	-0.244

Source: The Østergaard Personality Survey.

social potential convincingly drive the factor types in different directions.

- Factor 1: Synnovation creator has strong leadership and innovation potential, good social potential and weak efficiency potential.
- Factor 2: Administrator has strong efficiency potential, weak social potential and negative innovation potential. Regarding leadership potential, the functional categories display negative change management and weak positive motivation management and one strong positive trait – target drive – in otherwise negative effectiveness management.
- Factor 4: Team organizer has strong social potential, good efficiency potential and weak innovation and leadership potential.
- Factor 7: Rebel has positive but weak leadership and innovation potential and negative social and efficiency potential.
- Factor 8: Adventurer has very strong innovation potential (which explains the opposition to factor 2); strong leadership potential; mixed efficiency potential with a positive functional category (integrity) and a negative functional category (stability); and moderate social potential with a negative functional category (cooperation).

Innovation and leadership appear to be essential personality attributes for understanding the profound, innate disposition of individual entrepreneurs. Innovation and leadership preferences are related to the disposition of factor types towards the type of enterprise launched. Strong

leadership attributes correspond to an interest in growth from managing employees, while growth due to abundant ideas indicates a strong innovation capacity. A third proposition, therefore, emerges:

Proposition 3: A psychological interpretation of the traits in the factor types explains the different motivations for firm growth, type and size. It is likely that increasing in-depth knowledge through interpretation of personality traits may improve predictions of the activity most profitable for the entrepreneur and most beneficial for society.

Discussion of the propositions and their rationales

The themes discussed in this section relate to the considerations set out in the introduction and the propositions developed in the explorative analysis. First, the measurement challenges are further reviewed to support the method used and the findings. Second, the scholarly debates on the personality traits of entrepreneurs are related to the findings. Finally, the logical causes are summarized into three categories within entrepreneurship: the self-employed, the business owner and the entrepreneur.

Measurement challenges

Generally, conducting qualified research requires that the entrepreneurs studied should be differentiated from each other beforehand, and their psychologically translated behaviour be charted correctly (Sarasvathy, 2003). The research techniques in entrepreneurship, therefore, are critical (Gartner et al., 1994) and the process of measurement should be addressed further. Davidsson (2008) suggests using selection mechanisms to differentiate between individuals in samples drawn from the general population and sees discrepancies in the vague research on personality traits using mostly paper-and-pencil questionnaires. In support of the method used in this article, he claims that personality traits should be charted using real-world behaviours, attitudes, intentions, goals and personality traits in a population of entrepreneurs (Davidsson, 2008).

Often, research questions in the entrepreneurial literature concern how and why some people manage to start new ventures or invent new solutions. These questions address how and why some people but not others recognize opportunities, decide to become entrepreneurs, exploit new opportunities and succeed (Baum et al., 2007). However, over time, certain personality characteristics, such as risk willingness, might become overrepresented in research due to scholars' interest in twisting the picture of an entrepreneur with the use of 'fabulous stuff' (Gartner, 2007: 325), giving rise to a new paradigm and dominant research method.

Generally, researchers struggle with how to capture the fine texture of human nature when, for instance, observing,

measuring, interpreting and teaching other humans. Most likely, future research will change due to improved equipment for measuring brain functions, but for the time being and given the limitations of existing instruments, the crucial issue in measuring entrepreneurs is to exploit the advantages of a full personality profile. In agreement, Hisrich et al. (2007) claim that past research has underestimated the role of entrepreneurs' personalities due to design and methodological limitations, which may explain the many weak results. For instance, personality characteristics fail to distinguish reliably between entrepreneurs and non-entrepreneurs and generally account for only a small proportion of the variance in entrepreneurial success (Cromie, 2000; Hisrich, 2000). Moreover, Hisrich et al. (2007) pose many questions about the personality characteristics of entrepreneurs and call for psychologists aiming to develop theory in this area to undertake empirical research and fill the gaps in the entrepreneur-centred literature. Psychology is considered to be key in helping identify the factors that influence new venture creation and success (Hisrich et al., 2007).

Finally, entrepreneurship needs to be assessed broadly on the individual level, preferably over longer periods of time (Davidsson, 2007). In addition, Atkinson and Hoselitz (1958) argue that studies should distinguish between entrepreneurs in different occupation types and firm sizes when exploring the relationship between personality traits and entrepreneurs. 'These reflections appear to indicate a series of important conditions for the design of a research project in the interrelations between entrepreneurship and personality' (Atkinson and Hoselitz, 1958: 108). This article therefore contributes a new approach – the measurement of the whole personality and psychological interpretation – with the aim of influencing future research.

Personality characteristics of entrepreneurs

Academic researchers have studied the characteristics of entrepreneurs due to their relationship with economic growth, as described above, and to understand why some become more successful than others (Shaver, 2007). In this vein, and as an example of most research in this field, Frese and Gielnik (2014) introduce the Giessen–Amsterdam model and propose that different action characteristics are important in different phases of entrepreneurship. In the first phase, the entrepreneur identifies and develops an opportunity for a viable business (Dimov, 2007). Second, the start-up activities establish viable business structures and operational procedures (Gartner, 1985) and the entrepreneur tests the product's appeal to buyers (Reynolds, 2007). In the third phase, the entrepreneur's handling of conflicts, negotiation of contracts, formation of alliances and development of new business strategies lead to firm survival and growth (Baron, 2007). Unfortunately, the

overall literature on the characteristics of an entrepreneur lacks empirical findings (Gregoire et al., 2006).

As briefly mentioned above in the methodological section, research on personality characteristics began in the 1960s and 1970s, focusing on the personality trait of a need for achievement (McClelland, 1967). Peaking in the 1980s, personality research on entrepreneurs has described entrepreneurs as anxious, inner-directed, moderate risk-takers with an internal locus of control (Kets De Vries, 2009; Miller et al., 1982), high achievement motivation and a need for autonomy, power and independence (McClelland, 1987). In contrast, entrepreneurship is also seen as a social construct (Chell, 2008), as entrepreneurial learning happens through action (Pittaway et al., 2009) and is related to the context (Harrison and Leitch, 2005; Leitch et al., 2012; Politis, 2005). The entrepreneurial learning approach has been further developed into learning to lead in the entrepreneurial context (Kempster and Cope, 2010). In this article, entrepreneurial leadership is seen as a pivotal attribute in manifesting the entrepreneurial idea and as an innate skill which can be developed through experience (Kempster, 2006; McCall, 2004). Besides learning through experiences, constant maintenance is a key requirement in contextual learning, such as network learning (Smith et al., 2017).

However, most descriptions of entrepreneurs depend on the moment and on social and environmental circumstances. Entrepreneurship is a complex, dynamic, multi-phase process in which the entrepreneur's personality characteristics are a mix of predisposing personality traits, lessons learned from the environment through, for instance, parents and teachers, and characteristics learned from the role itself (Østergaard, 2017).

Against this background, this study introduces a novel line of research to expand the literature. Accordingly, the article presents conflicting views on entrepreneurial behaviour as influenced only by the context and consensual views that take into consideration both contexts that provide a meaningful identity and entrepreneurial predispositions such as initiative-taking. Research in the field can be improved by adopting a mixed-methods approach to triangulate findings, offering novel perspectives (Jones et al., 2018).

Reasons to categorize entrepreneurs

The study findings indicate that some entrepreneurs independently found and operate businesses, while others found, operate and collaborate in businesses. Moreover, most entrepreneurs engage in activities that lie somewhere in between. Hence, the data on entrepreneurial growth should also be multifaceted. In some cases, growth is measured by the number of employees; in others, by the number of ventures or associated freelancers and partners. This study operationalizes and further categorizes these factor types.

First, regarding personality traits, the factor analysis, following the entrepreneurial typology, clearly shows that the leadership trait of willingness to delegate tends to influence entrepreneurs' behaviours. The six principal traits characterizing entrepreneurs are identified based on their frequency in the factor analysis: self-confidence and willingness to delegate, followed by dominance, passion, creative drive and risk willingness. Leadership arguably is essential to entrepreneurial performance, even more so than innovation, as the three traits of willingness to delegate, passion and dominance represent motivation management, and the traits of risk willingness and creative drive fall under change management, which are both part of the leadership attribute. Self-confidence is the only trait outside leadership.

Second, the innovation attribute marks significant differences among the factor types of entrepreneurs. In practice, the variation in innovation preferences indicates the differences between a traditional employee and an inventor with limitless ideas. In this construction, a traditional employee attitude applies to both a chief executive officer and a self-employed individual running a business. It is therefore suggested that factor 2, administrator, should be labelled as self-employed or a business owner rather than an entrepreneur. Examining leadership potential, though, shows that factor-2 individuals are not eager to manage employees, making it clear that this factor type better fits with the self-employed.

Third, the six principal traits of an entrepreneur emerging from the factor analysis certainly argue for the strength of leadership skills among what we could call genuine entrepreneurs. The importance of leadership, which apparently differs among the entrepreneurial factor types, is thus a subject for further discussion. For instance, it remains a question how the managing aspect comes into play, in contrast to leadership, as does the preference for stability over change. One factor type seen as a core managerial leader is not yet identified; however, the detailed differences among the positive and negative relationships to change management, motivation management and efficient management indicate a significant area for future research. In response to this indication, a third category is suggested: the business owner. A business owner launches a start-up with the aim of founding a family business or a similar enterprise expected to last for generations. In general, the business owner has high leadership skills and low interest in innovation.

In sum, the entrepreneurial types found here are similar to the factor types – the synnovation creator (factor 1), the team organizer (factor 4), the rebel (factor 7) and the adventurer (factor 8) – based on the positive and negative relationships of the personality traits measured. The exclusive emphasis on leadership and innovation skills indicates the innate entrepreneurial preferences of these four factor

types, though the last two mainly possess entrepreneurial potential to be further developed.

In general, the results analysed are congruent with research identifying entrepreneurial personality traits, such as risk willingness, achievement instinct and autonomy (Judge et al., 2002; McClelland, 1985; McClelland, 1998; McClelland and Burnham, 2003). The novelty of this study arises from the suggested categorization of entrepreneurs. The findings also point to a need for further empirical reflections among scholars, especially in relation to the detailed diversity among the nine factor types of entrepreneurs. For instance, the self-employed's lower inherent disposition towards innovation and interest in managing employees differs significantly from the common views of entrepreneurs. In addition, the characteristics of leadership skills differ among the business owner, the entrepreneur and the self-employed.

Concluding remarks

In response to the call to action in psychology from Hisrich et al. (2007), this article seeks to fill gaps in the entrepreneurship literature through this empirical research identifying the psychological factors that influence new venture creation and growth. The study contributes to the theoretical framing of entrepreneurship through explorative research on the personality traits of active entrepreneurs using factor analysis and psychological interpretation.

Taking as its point of departure the fact that good and poor entrepreneurs exist, this study suggests, based on empirical evidence, that the diversity among entrepreneurs most likely results from diverse personality traits suited for different purposes. This perspective recalls the ongoing scholarly debates on the measurement challenges in entrepreneurship and on whether the characteristics of an entrepreneur are inherent or learned. This research supports considering both and adds new empirical knowledge to the debates.

The results from investigating the personality characteristics of entrepreneurs demonstrate that the entrepreneurial factor types form at least two independent, differentiated categories. Moreover, the psychological interpretation of the personality traits involved in each factor type also describes the differences among entrepreneurial types. This diversity supports further categorizing entrepreneurs rather than considering all entrepreneurs to be equivalent. The psychological analysis finds different preferences among the factor types, which certainly influence the motivations for firm type and size and are argued also to affect the type of entrepreneurial growth. Considering this knowledge can help improve activities in, for instance, entrepreneurial learning, financial support and policy initiatives to increase economic growth through entrepreneurship.

In short, this knowledge based on empirically collected and thoroughly analysed personality trait data provides

implications for categorizing entrepreneurial people as self-employed, business owners or entrepreneurs. The findings from this exploratory study show that entrepreneurial personality characteristics determine (1) the distinctions among entrepreneurs; (2) the profound diversity in the directions of entrepreneurial activity; and (3) predictable variation in growth.

The entrepreneurial type categorized as self-employed has no interest in employing others. The self-employed are satisfied working alone in professions similar to many others, such as hairstyling. They need not innovate and are characterized by a strong target orientation. Their main motivation is maintaining a work–life balance. The self-employed spur growth in local environments mainly through local sub-suppliers and increased levels of local services, which are important in preventing rural–urban migration.

In contrast, the business owners lead companies with several employees with diverse backgrounds and educational levels. Business owners, however, have no interest in innovation, except for natural adaptation to stakeholder demands. Their main interest is to keep their businesses running, often for generations, facilitating local employment growth.

The entrepreneurial category of core entrepreneurs is the most innovative and differs significantly, especially in leadership preferences. Hence, core entrepreneurs are expected to be comparable with the synnovation creator (factor 1) and the team organizer (factor 4), while the rebel (factor 7) and the adventurer (factor 8) are comparable with potential entrepreneurs who could directly benefit from learning programmes.

In addition, the diversity found in the factor analysis enables scholars, politicians and practitioners to relate the entrepreneurial findings to the nine typologies of entrepreneurs. Two typologies (factors 6 and 9) are related to immediate recognition of the non-entrepreneurial mindset, one typology (factor 3) to spotting desperate survivors and two typologies (factors 7 and 8) to activating entrepreneurial learning, networking, teams, growth programmes and recruitment of potential enterprises for incubation parks. Two typologies (factors 1 and 4) are connected to the expected most prosperous outcomes, because they are expected to manage on their own and prefer to continue this way. The last two factor types (factors 2 and 5), with their more administrative preferences, point to the need to reorganize the concept of entrepreneurs into three categories. Nevertheless, the value of the findings could be increased by conducting further research across cultures.

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