

Entrepreneurial Orientation and the Handling of Complexity in Small and Medium Enterprise Research

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Abstract Entrepreneurial small- and medium-sized enterprises (SMEs) are regularly operating in very complex settings. The methods and tools used by SME research to account for that complexity are commonly derived from only one of both worlds: Either the world of entrepreneurship with its emphasis on personal traits and characteristics of the entrepreneur, or from the world of large corporations and its focus on singular issues, such as processes or organizations. SME research is stuck in the middle, being the step-child of two unlikely parents who live in worlds apart. Specific research, targeted at entrepreneurial small and medium enterprises as a whole, could help to close this gap and to integrate the different approaches in a comprehensive context. A holistic view of the formation and growth process as well as on later stages, using a company-related perspective, is needed in SME research. One approach that could prove helpful is configurational analysis using the concept of Entrepreneurial Orientation. Configurational approaches are helpful particularly in ongoing transformation phases, as common in young companies. Embedding of Entrepreneurial Orientation in the context of the company therefore could establish an instrument that would make it possible to analyze especially small and medium enterprises in all phases of their lifecycle appropriately. The complexity of the enterprise as such as well as of its environment can hereby be described and analyzed in a holistic way, independent of the stage and age of the company, thus providing a bridging of the gap described above.

Keywords Configurational analysis • Entrepreneurial orientation • SME research

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1 Introduction

There is no doubt that young, emerging companies are regularly operating in very complex settings: Markets are often niche markets with hidden characteristics and may be just emerging or developing rapidly, the dependence on business partners and other players may be very high and hard to control, and a number of resources typically prove to be valuable but very rare, and therefore of strategic value (cf. e.g., Bhidé, 1994; Santos & Eisenhardt, 2009; Venkataraman, Van de Ven, Buckeye, & Hudson, 1990). Also, especially technical start-ups deal with new technologies that could change the game in major or minor ways, and may have unforeseen implications for both society in general as well as on specific markets. Furthermore, the resource constraints set on most freshly founded, and often underfinanced, companies lead to a high need to manage this complexity in a most efficient way (cf., Lechner & Dowling, 2003; Timmons & Spinelli, 2009)—and all of this has to happen in an area of extreme uncertainty.

One could argue that the complexity found in the environment of the entrepreneurial company is not an inherent attribute of entrepreneurship, but following the deliberate choosing of this specific environment by the entrepreneur: The founder could very well choose to act in a less chaotic environment, i.e. a stable market with little need for rare resources and being not dependent on relationship with partners. However, this does not only contradict the Schumpeterian approach of “creative destruction” and its inherent tendency to (limited) chaos and complexity, out of which new paradigms may arise (cf., Schumpeter, 1912). Also, from a market point of view, these complexities often serve as barriers to entry (Tushman & Anderson, 1986), making success in this environment more difficult, but also more rewarding, leading in the case of success to above-average returns, and therefore attracting entrepreneurs by nature (cf. Forlani & Mullins, 2000).

While the complexity of the environment of the start-up is quite apparent, the complexity inside the organization is considerably smaller at first look. The entrepreneurial team consists rarely of more than three to four people, and limited resources add to keeping the number of employees manageable, in most cases. Therefore, hierarchies are flat, communication channels direct and ways of decisions short, with decisions often made collectively among the founders. Also, the need to use resources efficiently often takes companies with inefficient and overly complex processes in an early stage right out of the market. This may not be the whole picture, though: Complexity may arise from the fact that most processes are still very informal and subject of constant change. Such may be change in personnel, with not only acquiring additional staff (and therefore additional knowledge and skills) that have to be incorporated, but maybe even losing important members, whose skills and knowledge have not been absorbed by the company and are therefore hard to replace. Also, the business model or production processes may change, or the product range may be adjusted or extended, as is quite common in the growth process. All of these changes will lead to needs to adapt by other parts of the organization, and therefore to more complex day-to-day operations.

This situation changes quite drastically with time: The environment of the company becomes more stable over the years, with more mature markets, smaller growth rates and more forgiving relationships. On the other hand, surviving companies often have grown to a significant size, thus having a more complex organization as well as more defined processes. Hierarchies and specializations make the decision making process more formalized, which clear responsibilities. Product development has often reached a higher level so that further improvements will not be as drastically as in the first years, and research advances may not be incorporated as fast as in the beginnings. Consequently, the complexity of small and medium enterprises in general is differing significantly from the complexity of start-ups—not necessarily in the amount of complexity, but in the type.

2 Researching Small and Medium-Sized Entrepreneurial Companies

Many concepts have been transferred to the Entrepreneurship and small- and medium enterprise (SME) sector from large corporation research (Tan, Fischer, Mitchell, & Phan, 2009; Torrès & Julien, 2005), arguing that the most successful companies will grow into large-scale corporations, eventually, and may therefore be seen just as ‘small large companies’. Thus, relatively little research has been undertaken to develop tools and methods specifically for entrepreneurial SME, or at least to adapt existing tools based on theory building, not only on empirical testing.

While this must not necessarily be a problem, it turns out that most methods and tools are not used for research in entrepreneurial SME because of their great use and valuable contributions, but merely because they are already there, and are already used on (seemingly) similar research subjects. Tan et al. (2009, p. 242) emphasize:

[T]o date, it is arguable that relatively little of our energies as researchers studying small entrepreneurial firms have been devoted specifically to theory building. To a much greater extent, we have tested, and occasionally marginally refined, theories developed to explain the behavior of larger firms.

This leads to the situation that most tools used today in (entrepreneurial) SME research are neither developed specifically for entrepreneurial SMEs, nor argued for if they account for the specific complexity of small and medium entrepreneurial enterprises. This lack of targeted research and theoretical background that could serve as a base for empirical studies and the development of approaches as well as theories should be seen as a critical issue.

Instead, the methods and tools used for SME research are commonly derived from only one of both worlds: Either the world of entrepreneurship with its emphasis on personal traits and characteristics of the entrepreneur, or from the world of large corporations and its focus on singular issues, such as processes or organizations. SME research is stuck in the middle, being the step-child of two unlikely parents who live in worlds apart.

The decision to use approaches from only one of the two worlds, general business administration or Entrepreneurship, is mostly due to practical considerations. Research often derives concepts and theories from other research subjects, which again focus on partial aspects. For example, a number of studies center on the entrepreneur himself as object of research, while other approaches use organizational theories which do not include the founder's personality at all. In general, intersections or interfaces between these approaches which would allow a cross-over view using both theoretical lenses do not exist. Thus, a continuous, integrated analysis over time is hardly possible. Shane and Venkataraman (2000, p. 217) summarize the problem:

As a result, many people have had trouble identifying the distinctive contribution of the field to the broader domain of business studies, undermining the field's legitimacy. Researchers in other fields ask why entrepreneurship research is necessary if it does not explain or predict empirical phenomena beyond what is known from work in other fields. Moreover, the lack of a conceptual framework has precluded the development of an understanding of many important phenomena not adequately explained by other fields.

This is not a purely theoretical problem: The methods management consultants use for entrepreneurial SME are either based on entrepreneurship consulting (which consists mostly on financial advising and counseling the entrepreneur), or large company consulting, which consists of advice in specific areas, such as process or innovation consulting. This seems not to be a successful way of providing support for entrepreneurial SMEs: Bennett and Robson (1990) find that consulting for SMEs has relatively small impact on business success, with less impact than e.g. (business) friends, customers or (external) accountants. Chrisman (1989) finds in his empirical study that operational and administrative advice from consultants are not found valuable by entrepreneurs, even if they sought specifically for that type of advice. The reason for this could be found in the failure of understanding the specific needs of entrepreneurial organizations: Rind Christensen and Klyver (2006, p. 305) states that literature agrees that "the main problem in consultancy is how to define the problem in the organization", both in consulting small and large enterprises. Accounting for the variation of complexity of companies in different stages, as described above, therefore seems to be necessary when solving this problem.

Specific research, targeted at entrepreneurial small and medium enterprises as a whole, could help to close this gap and to integrate the different approaches in a comprehensive context (cf. Torrès & Julien, 2005). The specific characteristics of the company need to be taken into account regardless of stage and age of the company. Therefore, a holistic view of the formation and growth process as well as on later stages, using a company-related perspective, is needed in SME research. This perspective allows to look at attitudes and behavior of both individuals as well as organizational units (Covin & Lumpkin, 2011) and would lead to a deeper understanding on how entrepreneurial action is performed. Moreover, it enables a distinction of the enterprise as such from the attitudes and behaviors of the individuals that form the company (Covin & Lumpkin, 2011), making thereby the next step from most entrepreneurial approaches that focus on the entrepreneur as

such. Also, an instrument is needed that addresses the company as a whole, not restricted on single aspects or organizational units of the company and therefore trimming complexity unnecessary.

3 Configurational Approaches in the Field of Entrepreneurship

Configurations (also called archetypes) contain “elements or items that represent a single domain or an aspect of organizations, such as environment, structure, or strategy” (Dess, Newport, & Rasheed, 1993, p. 776). Miller (1996, p. 510) emphasizes the importance of configurations for the company’s success: “Configuration, in short, is likely to be a far greater source of competitive advantage than any single aspect of strategy.”

Mintzberg, Ahlstrand, and Lampel (1999) explain further that configuration approaches are helpful particularly in ongoing transformation phases, as common in young companies. Embedding of Entrepreneurial Orientation in the context of the company therefore establishes an instrument that makes it possible to analyze especially small and medium enterprises in all phases of their lifecycle appropriately. The complexity of the enterprise as such as well as of its environment can hereby be described and analyzed in a holistic way, independent of the stage and age of the company, thus providing a bridging of the gap described above. Hence, a configurational approach could help to solve the second problem stated above: By accounting for the complexity not only of the organization, but also of its environment in an integrated model.

To account for this holistic approach, the inclusion of different perspectives is necessary. Miller (1987) states that the creation of archetypes of enterprises is basically determined by four imperatives: (1) the environment of the company (including the available technology), (2) the organizational structure, (3) the leadership and (4) the strategy of the company. A change in at least one of these imperatives is a prerequisite for a change of the configuration of the company, and thus for the transition from one archetype to another. Miller (1987) also assumes that configurations, while influenced by all of these imperatives, are in most cases dominated by one of the imperatives. However, he also notes that especially in phases of transition, several imperatives may have influence on each other, thus creating an area of tension in specific archetypes.

Hence, the key for configurational approaches to provide value in the research of entrepreneurial SMEs is the selection of the right variables to describe the research object. Again, usually applied variables are often based on entrepreneurship research, and therefore too dependent on the personality of the founder, or based on research of large corporations, using variables that cannot be measured effectively in small enterprises (e.g. Bruhn, Karlan, & Schoar, 2013; Brunswicker & Vanhaverbeke, 2015; Colombo, Piva, & Rossi-Lamastra, 2014). Thus, what is

needed are measures that span the company's lifetime and organizational growth and can be applied in any state, regardless if the founder is still with the company.

As discussed above, there are four domains determining the definition of archetypes: Structure, leadership, strategy and the environment of the company are imperatives for determining the configuration. First, we will discuss how these domains can be integrated in empirical analysis, i.e., which observable variables can be used that are available also for small and medium-sized companies. Here, we will include well-used variables from the literature, the "usual suspects" used in configurational research. Then, we will expand this first model by including Entrepreneurial Orientation and discuss its implications.

The domain that proves to be least difficult to describe for SMEs is the environment domain. Since the environmental challenges are the same for companies of all size and age, researchers can use established measurements from both entrepreneurship and business research.

The influence of its environment on the company is determined by three main factors, as Dess and Beard (1984, p. 55) explain. With reference to Aldrich (1979), they name the areas of availability of resources ("munificence"), market dynamics and complexity.

The greater the availability of resources in an industry, the higher the amount of reserve assets a company can hold, thus affecting its behavior and attitudes, such as willingness to take risks (cf. Boyd, 1995, p. 305). The availability of resource is according to Aldrich (1979, p. 55) primarily depending on market growth. According to Simerly and Li (2000, p. 38f.), Market dynamics also have significant impact: "[A]s the degree of environmental dynamism varies across industries, it is reasonable to expect that there should be significant differences in the adaptive capabilities required for survival, and that these differences should have performance implications."

Complexity is described by Boyd (1995, p. 306) as inequality of competitors in a given market. However, the competitive structure of an industry does not only lead to more or less complex environmental conditions, but even to more or less hostile conditions. As Covin and Slevin (1989, p. 82) explain: "[T]he findings do suggest general differences in the effective strategic management of small firms in these [hostile resp. benign] environments". They find that the reason for this is the necessary capacity for structural adjustment in hostile environments (cf. Hall, 1980) and for the use of different leadership styles (see Khandwalla, 1976).

While those measures can be easily adapted from organizational and entrepreneurship, this is much more difficult for the three domains of structure, leadership and strategy.

To describe the structure of the company, the size of the organization as well as its maturity can be used. Both of these variables are available for small companies and are well-used in configurational research (e.g. Anderson & Eshima, 2013; Child & Hsieh, 2014; Raymond & Croteau, 2006; Swoboda, Meierer, Foscht, & Morschett, 2011). However, relatively speaking, the structure of the company is for small enterprises less relevant, compared to the other domains (cf. Miller, 1987).

This is also due to the fact that the spread of possible values is relatively small for small companies.

Leadership in entrepreneurial companies are highly dependent of the ongoing influence of the founder, a variable that is specific to entrepreneurial companies. Ogbonna and Harris (2000) discuss that in management research as a whole, the focus has shifted away from the manager/entrepreneur and his personal traits and characteristics to leadership style and behavioral approaches. Furthermore, a number of studies argue that leadership can be measured by level of hierarchies, incentive and monitoring systems, and organizational aspects as controlling and planning systems or degree of specialization (e.g. Greenwood & Hinings, 1993; Hart, 1992; Mintzberg, 1979). Organizational aspects are, in turn, of course also dependent on the structure of the company, especially the before-mentioned aspects size and maturity of the organization. One might argue that these variables may be even more useful when measuring leadership than structure.

Measuring the strategy aspect of SMEs can prove to be quite difficult. Observing the implementation of strategies, like using R&D expenses as measure for innovation, is quite difficult in small companies with no dedicated R&D facilities or even departments. Due to resource restrictions, a number of strategies are also not feasible for SMEs, resulting in similar strategic approaches for most of the smaller companies: Miller (1987) argues that SME strategies build mostly on efficiency, such as cost leadership. This concentration of SMEs on a small number of strategies does not speak in favor of using ‘implemented strategy’ as a measure.

A number of studies fall back on observing the strategy building process, i.e. not what strategies are used, but how are those strategies derived (e.g. Hart, 1992; Kollmann & Kuckertz, 2006; Miller, 1983), thus including organizational aspects.

With the exception of environment, one can argue that the domains are overlapping to quite an extent, having similar or even the same measures to observe different aspects of the configuration. Furthermore, a number of measurements are working in large enterprises, but are not feasible in smaller companies, especially in the field of strategy. Here, a concept is needed that offers not only practical measures that can be obtained in small-as well as in medium and even large companies, thus allowing to observe the growth path of a company with an integrated tool. Furthermore, it should also offer a holistic view, filling the gaps between the dimensions and linking them together.

4 Entrepreneurial Orientation and Archetypes: A Holistic Approach

One inclusive approach that may prove helpful here is the concept of “Entrepreneurial Orientation”. This approach, differing from many other concepts in entrepreneurship research, shifts the focus of analysis from the entrepreneurial behavior

of individuals within a company to behavior or characteristics of the organization itself (Lumpkin, 2011).

Entrepreneurial Orientation is conceptualized usually in three to five dimensions. According to Miller (1983), an organization can only be seen as entrepreneurial oriented if it is willing to (1) take on risk, (2) is innovative, and (3) proactive in the market; Lumpkin and Dess (1996) also find the factors (4) autonomy, and (5) competitive aggressiveness to be important.

It is important to understand that Entrepreneurial Orientation is not a replacement of existing analyses, but rather an addition to the toolkit of the entrepreneurial scholar that helps to cover the entrepreneurial process. This is a crucial point, since it does not limit the concept on new ventures, but opens it for all kind of entrepreneurial behavior. Fayolle, Basso, and Bouchard (2010, p. 716) define Entrepreneurial Orientation as “a collective mindset that encourages and facilitates firm’s entrepreneurship behaviours [sic!]”. Covin and Slevin (1991, p. 8) emphasize the behavioral aspect as well: “A behavioral model of entrepreneurship is suggested because behaviors rather than attributes are what give meaning to the entrepreneurial process. An individual’s psychological profile does not make a person an entrepreneur. Rather, we know entrepreneurs through their actions. [. . .] In short, behavior is the central and essential element in the entrepreneurial process.”

However, Entrepreneurial Orientation is not necessarily limited to behavior of the entrepreneur as a single person, but may also refer to the behavior of a company, thus allowing for analyzing companies as a whole and is not limited to a department or an individual (Covin & Wales, 2012). It therefore provides a tool that can model the entire lifecycle of an enterprise and integrates elements of entrepreneurship as well as organizational and strategy research.

Thus, Entrepreneurial Orientation seems to add by allowing exploring new ventures over several lifetime stages, while still keeping the entrepreneurial mindset in focus, thus accounting for the first problem stated above.

Recently, most of the research on Entrepreneurial Orientation focused on it either as a summarized and therefore undifferentiated view of the five components, or on each dimension independently and isolated from each other (Covin & Lumpkin, 2011). A configurational approach to study the composition of Entrepreneurial Orientation itself has been largely neglected (Miller, 2011). However, such an approach may significantly improve our understanding of the development of Entrepreneurial Orientation in the process of corporate development; especially in the context of an external operating environment (see Covin & Lumpkin, 2011; Miller, 1983, 2011). Meyer, Tsui, and Hinings (1993) confirm that configurational approaches provide a holistic view.

We have therefore shown that a configurational approach using Entrepreneurial Orientation may have the potential to provide a stage-independent instrument for analysis of the entrepreneurial company that takes the complexity of organization as well as its environment into account. Also, we have argued for the applicability of configurational approaches in the field of entrepreneurship. Next, we will discuss how Entrepreneurial Orientation could be used in building archetypes. Finally, we

will analyze empirically if the inclusion of Entrepreneurial Orientation will bring additional value to configurational analysis of entrepreneurial SMEs.

5 Entrepreneurial Orientation and the Configurational Imperatives

Recent work (Jambulingam, Kathuria, & Doucette, 2005; Wiklund & Shepherd, 2005) use Entrepreneurial Orientation explicitly as an overarching construct, spanning various domains. Each of its dimensions can be seen as an aspect of one or more domains, as shown in Table 1 and discussed in the following paragraphs.

Miller (1983, p. 777) assigns the Entrepreneurial Orientation dimensions of proactivity, risk taking, and innovativeness, as well as entrepreneurship in general, to the strategy domain. Covin and Slevin (1989, p. 79) use the same three elements to represent the “strategic posture” of the company. Lumpkin and Dess (1996, p. 136) emphasize that Entrepreneurial Orientation, including the dimensions of autonomy and competitive aggressiveness, derives from the strategy selection of the entrepreneur. However, entrepreneurship and Entrepreneurial Orientation cannot be seen as purely strategic elements. The attitudes manifested in an organization’s Entrepreneurial Orientation are having effects not only on the company’s strategy, but also on its behaviors and structures.

The innovativeness of a company can be seen as part of its strategy. The ability to innovate, whether in technical or market, is a competence of the company. Innovativeness as the decision to use these skills in business and to promote them further is a strategic decision, as Miller and Le Breton-Miller (1996) discuss. However, the structure of the company may support implementing this strategy by including the definition of work tasks, i.e. the degree of specialization and cooperation of employees (cf. Saleh & Wang, 1993, p. 15f.).

Also, its risk orientation is partly due to a conscious decision of the company’s management about its fundamental orientation, and can therefore be located in the field of the strategy (see Miller & Friesen, 1977). However, more evident than with innovation, the personality of the decision maker in the company plays a decisive role, as Nicholson, Soane, Fenton-O’Creevy, and Willman (2005, p. 170) argue.

Table 1 Categorizing the dimensions of Entrepreneurial Orientation-according to the four imperatives of Miller (1987)

	Structure	Strategy	Leadership	Environment
Innovativeness				
Risk-taking				
Proactivity				
Competitive Aggressiveness				
Autonomy				

This rather speaks for an assignment to the leading domain, as is done for example in Gartner (1985).

Proactivity is often associated with the domain of strategy, for example by Miller and Friesen (1977), or Julien, Joyal, Deshaies, and Ramangalahy (1997). Lumpkin and Dess (1996, p. 146) emphasize its connection with first-mover strategies (see Lieberman & Montgomery, 1988) and refer to Miller and Friesen (1978, p. 923), which formulate the main question for proactivity: “Does it shape the environment?” All these mentioned points speak for an allocation of proactivity in the strategic domain.

According to Lumpkin and Dess (1996, p. 148), the dimension of competitive aggressiveness refers on the tendency of a company “to outperform industry rivals in the marketplace”, which indicates a strategic allocation. Based on Porter (1985), they further state that the target of competitive aggressiveness is “to achieving competitive advantage” (Lumpkin & Dess, 1996, p. 149). An allocation to the strategic imperative seems appropriate, although Miller (1983, p. 785) here as well as for risk orientation, emphasizes the influence of the entrepreneurial personality, which would allow an association to the leadership domain.

Employees of a company that show a certain autonomy lead to the formation of a particular strategy of this company. Mintzberg (1978, pp. 945ff.) notes that in addition to the explicit strategy of the company, it often also develops an emergent strategy out of its *modus operandi*. Hart (1992, pp. 338ff.) developed such an emergent strategy development as part of its integrative framework and called it “generative mode”: “Strategy is made via intrapreneurship—new product ideas emerge upward, and employee initiative shapes the firm’s strategic direction.” Lumpkin and Dess (1996, p. 141) argue that “the freedom to act independently” is a prerequisite for such initiative by the employees of the company, while high formalization and rigid hierarchies within the organization may hinder it. Hence, autonomy may be allocated either to the field of leadership or structure; Lumpkin and Dess (1996) call it “organizational autonomy”. In total, the different dimensions of Entrepreneurial Orientation cover three of the four imperatives given by Miller, with environment as the only aspect not covered. Thus, Entrepreneurial Orientation seems a possible instrument for analyzing entrepreneurial companies over its lifespan as a whole.

As we have seen, the strategy domain is widely covered by the Entrepreneurial Orientation of a company. The different dimensions of Entrepreneurial Orientation all have strategic reference and cover both the content and the process component of the corporate strategy (cf. Ansoff, 1965).

The structural domain can be found in the Entrepreneurial Orientation dimensions of autonomy and innovativeness. However, the size of the company is a limiting factor for both of these dimensions especially in the area of SMEs. Therefore, size will also be included in the analysis, as well as the degree of maturity of the organization, measured by the age of the company.

Risk-taking, competitive aggressiveness and autonomy constitute the domain leadership. The continued activity of the founder will also be included, since in

smaller enterprises, entrepreneurial managers have a great deal of power, as Daily, McDougall, Covin, and Dalton (2002, pp. 390ff.) discuss.

6 An Empirical Analysis of the Contribution of Entrepreneurial Orientation

While we have discussed that configurational analysis based on Entrepreneurial Orientation may be a valuable instrument, its contribution to analyzing complexity is still unclear. Thus, in the next part of this chapter, we will carry out an empirical analysis to see if configurational analysis including Entrepreneurial Orientation adds significant value in analyzing the complexity entrepreneurial SMEs.

To do so, we will compare what configurations can be found in a sample of 744 German SMEs with or without including Entrepreneurial Orientation measures. Our goal is to see if adding Entrepreneurial Orientation to the analysis will allow a more detailed view on the internal and external complexities that face an entrepreneurial SME.

6.1 Sample Description and Operationalizing of the Variables

The sample used in this analysis is based on an online survey that was distributed between April and August 2012. In multiple rounds, ca. 49,000 emails were delivered to companies and self-employed persons in Germany, taken from a business database.¹ 8250 recipients opened the questionnaire, with 1049 recipients finishing all questions.

In the questionnaire, Entrepreneurial Orientation was selected using a 7-point Likert scale. Besides Entrepreneurial Orientation, several statistic data was inquired, such as number of employees, revenues, age of company, and if the founder of the company was still actively involved.

For the questionnaires that were completed, the internet domains of the email addresses were inspected to map the respective companies to one of 21 industries, using the NACE-classification 2.0. During this process, a number of responses were dismissed since they were not given by members of a business, but by members of societies, families or private individuals. The remaining responses were then anonymized.

Based on the industry mapping, each case was then assigned the respective market's competitiveness and dynamics. Following Boyd, Dess, and Rasheed (1993), these data are calculated using historical indices. The Herfindahl-

¹ Discover Europe Package EUROPA 2010—Discover Germany—Companies.

Table 2 Variables and their operationalizing

Entrepreneurial orientation	
Innovativeness	Assessment by employees
Risk-Taking	Assessment by employees
Proactiveness	Assessment by employees
Competitive aggressiveness	Assessment by employees
Autonomy	Assessment by employees
Company structure	
Size of the company	Assessment by employees
Age of the company	Assessment by employees
Leadership	
Founder still active	Assessment by employees
Environment	
Market dynamics	Classification of industry sector
Complexity resp. market competitiveness	Classification of industry sector
Availability of resources	Classification of industry sector

Hirschman-Index (HHI) is a measure for competitiveness and is given by the monopoly commission of Germany each year. In this study, we use the report of the commission given in 2012, containing the data for 2009. Market dynamics are calculated following Simerly and Li (2000, p. 40f.; cf. Boyd, 1995; Dess & Beard, 1984; Keats & Hitt, 1988). They are based on the variance of sector's sales over a time span of 5 years—in this case, 2004 until 2008, as given by the German Federal Statistical Office in the years 2001–2012 (for example, Statistisches Bundesamt, 2010, p. 615). To use this data, the industry branch codes had to be transferred from NACE 1.1 to NACE 2.2. This data was also used to calculate the availability of resources, following Boyd (1995, p. 312).

A final dismissal of responses was necessary because of missing data for a number of industries. Companies of the sectors “agriculture and forestry/fishing”, “Mining and quarrying”, “Public administration, defense, social security” and “education” were removed from the sample. The final data set used for the analysis was ultimately compromised of 744 companies.

Table 2 gives an overview of the used variables and their operationalization.

6.2 Methodology: Cluster Analysis

To Search for structural similarities in multivariate data sets, the concept of cluster analysis has been proven helpful. Cluster analysis methods are heuristic methods for the classification of observations (of objects or individuals) in similarity groups. They are being used successfully in the field of strategy research (see, for example Hatten, Schendel, & Cooper, 1978; Langan-Fox & Roth, 1995; Zahra & Covin, 1993). The aim is to find groups whose members differ in terms of classifying

characteristics from members of other groups as much as possible, but are homogeneous among the members of one group.

A probabilistic cluster analysis is used, namely the implementation of the 2-step cluster analysis of the software package SPSS IBM Corp, 2011a). As a distance measure, the log-likelihood method is applied, which can be used with both continuous and categorical variables. To determine the number of clusters, both the Bayesian Information Criterion (BIC) and the Akaike information criterion (AIC) are used. The log-likelihood distance measure is principally composed of a normal distribution for continuous and categorical variables. For the present record, these distributional assumptions cannot be confirmed for any of this variable, but empirical tests showed that the software used is fairly robust against violations of these assumptions (IBM Corp, 2011b).

6.3 Results of the Empirical Analysis

To see if Entrepreneurial Orientation leads to a significant contribution in describing entrepreneurial firms, we will compare the resulting archetypes with and without inclusion of the Entrepreneurial Orientation variables. A first analysis shows the cluster analysis not including Entrepreneurial Orientation results in a total of seven clusters, with a silhouette coefficient of 0.6—a value that, according to Kaufman and Rousseuw (1990, p. 88), is linked with reasonably structured data.

In a second step, we introduce the Entrepreneurial Orientation variables as additional data points into the analysis. By including this data, we control for Entrepreneurial Orientation and see if this changes the outcome of the analysis, i.e. the model as such as well as its measures of clustering. By doing so, we essentially control for Entrepreneurial Orientation.

The differences of both analyses are shown in Table 3.

The difference can already be seen in the number of clusters developed by the algorithm. Seven different archetypes are found without the inclusion of

Table 3 Members of clusters including Entrepreneurial Orientation × Members of clusters without Entrepreneurial Orientation

# of companies	Cluster without EO							Total	
	A	B	C	D	E	F	G		
Cluster with EO	1	274	0	0	5	0	0	0	279
	2	0	94	0	1	0	0	0	95
	3	0	0	132	6	0	0	0	138
	4	0	0	0	1	78	64	0	143
	5	0	3	0	35	0	42	0	80
	6	0	0	0	0	0	0	9	9
Total	274	97	132	48	78	106	9	744	

Entrepreneurial Orientation, while six archetypes are developing with Entrepreneurial Orientation included in the analysis. While a number of clusters remain (virtually) the same by the inclusion of Entrepreneurial Orientation (i.e., 1-A, 2-B, C-3, 6-G), the clusters D, E, F and G are restructured by using the additional data. To a great part, cluster 5 consists of a combination members of the old clusters D and F, with Cluster F leaving its remaining members to clusters 4 and disappears. The diversity of the results of both models is also confirmed by a chi-square test: A chi-square value of 3161.26 results in a significance of 0.000, showing significant differences in both values. Also, the inclusion of Entrepreneurial Orientation leads to a significant drop of the silhouette coefficient to 0.27—a value that, according to Kaufman and Rousseuw (1990), may point out a weak structure that may be artificial.

Both of these results, the change in the number of clusters in the resulting model as well as the loss of silhouette, strengthen our point that including Entrepreneurial Orientation in the analysis of entrepreneurial small- and medium-sized enterprises makes a difference and may help to cover the complexity of these entities in a more complete picture.

7 Conclusion

As we have argued in this chapter, the use of configurational approaches, accompanied by the use of Entrepreneurial Orientation as measure for structure, strategy and leadership, may have significant impact on developing appropriate tools for analyzing entrepreneurial companies over several life-time stages. Contrary to other tools used in this area of research, this approach is not just adapted from other fields, but may provide a distinctive look at the complexity of small and medium-sized entrepreneurial companies and their environment, that cannot be offered by tools coming from the field of entrepreneur-centered research or research on large companies. Accordingly, our empirical analysis also showed that including Entrepreneurial Orientation in the analysis has significant influence on the resulting archetypes.

Thus, the application of the nowadays well-used Entrepreneurial Orientation in configurational research may help to develop a better understanding of the complex, yet neglected field of entrepreneurial SMEs.

7.1 *Implications of this Study*

The implications of these findings are important for both the scientific as well as the practical sector. In the scientific community, the introduction of Entrepreneurial Orientation may allow analyzing entrepreneurial companies from their founding over a longer time of their lifespan, making it possible to understand the complex

development of the company as a whole over time. This holistic approach may also help to improve counsel and consult for the owner of these companies as well as the managers. By considering the characteristics of the firm at any time, not only existing tools can be applied more accurately, but also new tools and methods can be developed that take the complex situation of the company into account, compared to reacting just to the environment of the firm.

7.2 *Limitations of the Study*

This study, naturally, has a number of limitations. First, while the argument for including Entrepreneurial Orientation can probably be fitted to most types of analysis, we focus on configurational analysis. This is mostly due to the fact that configurational analysis is well known for handling complexity, as we have explained earlier in this chapter. However, in studying entrepreneurial SMEs, their complexity should be accounted for regardless the methods applied. We believe that most points we make can be applied with other methods, as well.

Second, the empirical analysis we undertook does not add great value in understanding the complexity of entrepreneurial SMEs as such. The resulting archetypes are not described in depth, neither are they discussed with regard to their specific characteristics. Also, especially the archetypes resulting from the full set of variables do not offer great differentiation, as can be seen on their low silhouette values. However, this is not necessarily a problem: Since the goal of this exercise is not to provide excellent archetypes, but to show that the inclusion of Entrepreneurial Orientation leads to significantly different archetypes. While we have argued in this study for the usefulness and possibility of including Entrepreneurial Orientation in the analysis of entrepreneurial SMEs, the actual application and the task to build meaningful and conclusive models that help to understand the complexity of this companies will hopefully be found in other papers.

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