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Strategic decision making in small firms: a taxonomy of small business owners

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Abstract: Most changes in firms take place after a decision has been made. Despite the small firms being no exception to this, the previous researches into decision-making processes have left this subject uncharted. The current study empirically investigates and identifies the different types of entrepreneurial decision makers. Drawing on a database of 646 entrepreneurs, five types of decision makers are distinguished: the Daredevils, the Lone Rangers, the Doubtful Minds, the Informers' Friends and the Busy Bees. We propose that the various types of Small Business Owners (SBOs) decision makers will differ in their cognitive abilities and find empirical support.

Keywords: strategic decision making; small- and medium-sized enterprises; SMEs; taxonomy; decision makers; cognitive ability.

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1 Introduction

Small and Medium-sized Enterprises (SMEs) play a key role in the modern market economy. The success of the small firms is, to a large extent, dependent on strategic decision-making practices (Robinson and Pearce, 1983). The strategic decisions made by the small and medium-sized business owners form the heart of entrepreneurship and can therefore be considered as essential for economic development. Yet, little is known about the decision-making process of those who are in charge of the small firms. The past researches focused mostly on the 'procedural rationality' of the decisions in large multinational firms (Brouthers *et al.*, 1998). These processes are often complex, involve multiple actors and are frequently an outcome of politics (*e.g.*, Eisenhardt and Zbaracki, 1992). However, there is a feeling among many researchers (*e.g.*, Papadakis *et al.*, 1998; Brouthers *et al.*, 1998; Gilmore and Carson, 2000) that the decision-making processes of the small businesses are different, which implies that many current models of strategic decision making are not suitable for explaining decision making in the small firms. Busenitz and Barney (1997) assert that entrepreneurs are more susceptible to the use of decision-making biases and heuristics than the managers of large organisations, which would imply a distinct decision-making process.

This paper explores how Small Business Owners (SBOs) make strategic decisions by developing a taxonomy of SBO decision making. We choose to focus on business ownership, since it has been recognised as a key dimension of entrepreneurship (Westhead *et al.*, 2005). Although it has been recognised that there are different types of SBOs (Birley and Westhead, 1993; Westhead and Wright, 1998; Wennekers and Thurik, 1999; Westhead *et al.*, 2005), little systematic research has been conducted to categorise the different types of SBOs and subsequently relate these types to the variations in the decision-making practices (*cf.* Forbes, 1999). Our main goal is to develop a taxonomy of the different types of decision makers in small firms. This is important not only for scientists, but also for practitioners. For the suppliers trying to sell

new applications and the policymakers who are designing policy interventions, for instance, it is important to understand how SBOs make strategic decisions so that they can carefully tune their actions to the decision-making process.

Drawing on a data set derived from 646 SBOs, we derive and validate a taxonomy of the five distinct types of SBOs with significant differences in their decision-making practices. We use a number of dimensions on which the SBOs may differ (confidence, innovativeness, the perceived risk, the consideration of alternatives, the problematic decision-making process and the economic situation). Besides developing a taxonomy of the SBOs, we follow up on Forbes' (1999) call to extend the work on the decision processes by adding a cognitive perspective. We include two important cognitive aspects that are expected to differ between the SBOs: experience (Hitt and Tyler, 1991; Cooper *et al.*, 1995; Brouthers *et al.*, 2000; Westhead *et al.*, 2005) and the level of education (Hambrick and Mason, 1984; Wiersema and Bantel, 1992; Wally and Baum, 1994; Brouthers *et al.*, 2000). In the next section, we describe the theoretical background of our study. Subsequently, the methodology is explained and the results are presented. The paper ends with a discussion and the limitations of the study and provides directions for future research.

2 Theoretical background

Strategic decisions are crucial to the viability of firms and are defined as "intentional choices or programmed responses about issues that materially affect the survival prospects, well-being and nature of the organization" (Schoemaker, 1993, p.107). They guide the organisation into the future and shape its course. For more than 40 years, scholars in the various academic disciplines have recognised the importance of strategic decisions, resulting in a broad variety of literature. We do not intend to provide the reader with an extensive overview of these works; rather, refer to the seminal articles of Eisenhardt and Zbaracki (1992), Schoemaker (1993), Schwenk (1995) and Hendry (2000) that present excellent overviews of the literature.

Entrepreneurs are often believed to have specific characteristics that influence the decision-making process (Brouthers *et al.*, 1998; Mador, 2000). They are also described as being distinct from other people (Low and MacMillan, 1988). Entrepreneurs are "decisive, impatient, action oriented individuals" (Smith *et al.*, 1988, p.224) that have been called "rugged individualists" (McGrath *et al.*, 1992). Empirical studies have demonstrated, for instance, that entrepreneurs are less comprehensive in their decision-making activities than the managers of larger firms (Smith *et al.*, 1988). A large empirical study by McGrath *et al.* (1992) also provided evidence for some of the unique cultural features of entrepreneurs compared to career professionals. Their results showed that entrepreneurs did indeed favour individualism, did not mind taking risks, were not egalitarians and were more motivated to make money. Similarly, Busenitz and Barney (1997) also claim that entrepreneurs and managers clearly differ from each other. One of the key differences relate to the way entrepreneurs perceive and think about risk. They tend to generalise easily from limited experience and are often overconfident that they will succeed.

In the entrepreneurship literature, there are two specific features identified concerning the context in which the small entrepreneurial firms operate. First, it is argued that these firms often face a hostile or uncertain environment in their decision-making activities (Hambrick and Crozier, 1985; Covin and Slevin, 1989). Unlike the managers in large firms, for instance, they do not have access to extensive information sources. The managers of large firms tend to be backed up by staff members to continuously scan the environment and gather information (Busenitz and Barney, 1997). Secondly, the environment of the small firms is dynamic and complex (Covin and Slevin, 1991). As a result, entrepreneurs tend to make decisions on the basis of biases and heuristics (Busenitz and Barney, 1997). Furthermore, in a more dynamic and complex environment, it is believed that the comprehensiveness (or rationality) of the strategic decision processes tends to be lower (Fredrickson, 1984; Fredrickson and Mitchell, 1984) and the cognitive issues become more important (Forbes, 1999).

However, the degree of uncertainty, dynamism and complexity will vary to a large extent, depending on the industry in which the small firms operate. Hence, not all small firm owners operate under similar circumstances. The environment in which a small firm operates might affect the propensity to exhibit certain cognitive biases (Baron, 2004), which will affect the decision-making processes. In line with Forbes (1999), we argue that there are indeed many different types of SBOs and that we should further explore the cognitive differences among them. Given the variety in the small firms, we think that there may be multiple types of decision makers in these firms. In a case study of the strategic behaviour among 20 small and medium-sized exporting businesses in Canada, Julien *et al.* (1997) identified three distinct types of small business and concluded that small businesses indeed do not behave like a homogenous group. Hence, we feel that it makes sense to further distinguish between the different types of decision-making processes of the SBOs.

In our study, we included several variables which we use to try to categorise the small firms on the basis of their decision-making behaviour. These variables are largely drawn from the entrepreneurship literature and are described and operationalised in the next section. Similar to Carter *et al.* (1994), we have actively searched the literature for the categories and properties of strategic decisions to build our taxonomy. We validate our taxonomy by analysing a set of variables that were not used to construct the classification, but is likely to differ across its classes (Hair *et al.*, 1995). Prior to explaining our methodology, we introduce two important cognitive factors that are believed to influence the strategic decision-making processes. We will not develop the hypotheses at this stage, since our intent is to develop, not test, theory. We do, however, want to indicate how these two factors may differ between the SBOs.

The importance of experience has been documented in a large number of studies. It has been shown that the amount of experience affects the strategic decisions. Through the development of cognitive frameworks, the experienced SBOs are expected to make decisions differently when compared with the less experienced SBOs (Hitt and Tyler, 1991). Hambrick and Mason (1984) also described the importance of experience. They found that the experienced managers focused on growth strategies, whereas the inexperienced managers focused on efficiency strategies. Westhead *et al.* (2005) argue that the stock and stream of experience largely determines the strategic decisions.

An individual's cognitive ability, reflected by a person's education level, also strongly affects decision making. Hambrick and Mason (1984), for instance, found that higher-educated managers had developed a more positive stance towards innovation.

Similarly, Wiersema and Bantel (1992) discovered that higher education was positively related to the likelihood of engaging in strategic change. Dollinger (1984) argued that highly educated people are more inclined towards extensive information search and analysis. The main reason for this is that they will be better equipped to deal with ambiguity and a large variety of stimuli (Bantel, 1993). The individuals with a greater cognitive ability will be more capable of making strategic decisions at a more rapid pace (Wally and Baum, 1994).

3 Methodology

3.1 Sample

For the current study, we used survey data that have been collected by the Dutch research institute EIM Business and Policy Research. Commissioned by the Dutch Ministry of Economic Affairs, this survey aimed to collect descriptive statistics and explore how the decisions in the small firms are made. It focused on those SBOs in small enterprises who had made at least one important decision in the past three years. The decision could be related to any innovation or project that was discontinuous (out of daily routine) and was perceived to be important. Various questions were asked on the characteristics of the SBO and the selected decision.

The data were collected by means of Computer-Assisted Telephone Interviewing (CATI) among 1200 SBOs within the Netherlands. The sample was limited towards the SBOs in the small firms, that is, the firms with no more than 100 employees. The respondents were sampled across eight industries: manufacturing, construction, trade, hotels and catering, transport, financial services, business services and personal services (like beauty parlours, fitness centres and hairdressers). The firms were equally distributed across the eight industries. The size class of a firm was measured by the full-time equivalents of employees. The distribution of the sample across the size classes was as follows: 0 to 4 employees (25.6%), 5 to 9 employees (15.0%), 10 to 19 employees (28.9%), 20 to 49 employees (12.8%) and 50 to 99 employees (17.8%). About 60% of the interviewed respondents had made an important decision in the past three years. The median of the investments related to the decision was 100,000 euros. Because the outlying and incomplete cases were skipped from the analysis, we could eventually use 646 respondents as a basis for our classification. All the respondents were responsible for the management of the day-to-day business and the strategic decisions of their firms. The median age of the respondents was 44 years (range: 21–76). Almost 88% of respondents were men and 13% had a university degree.

We remark that our data are not completely representative of the small business population in the Netherlands. For example, EIM (2004) shows that 5.2% of the small firms belong to the hotel and catering industry, whereas 12.5% of the small firms in the sample used for this paper represent this industry. This means that the small firms in the hotels and catering industry are overrepresented. One should notice, when reading this paper, that the descriptive statistics presented later on provide no reliable estimation of the population figures. This implies that, in practice, the frequencies of our clusters may be somewhat different. However, for the goal of our study, this is not considered problematic.

3.2 Measures

The survey asked the SBOs various questions on their most important decision in the past three years. The questions were constructed based on a qualitative pilot study and a search of the literature. The pilot was performed in 2002 and 2003 and consisted of 20 in-depth interviews with the SBOs (Gibcus and van Hoesel, 2004). Focusing on the recent decisions of strategic importance, it tried to recover what the decision-making process in the small firms looked like. The interview script was inspired by Mintzberg *et al.* (1976), it contained only open-ended questions (How did the idea come along? How did you experience complexity? How many alternatives did you consider?). Most of the theories concerning the decision-making process (Mintzberg *et al.*, 1976; Papadakis *et al.*, 1998; Mador, 2000) gravitate around the models of decision making that include the SBO, the environment and the characteristics of the strategic decision itself. The in-depth interviews confirmed that these were key aspects. As a basis for the current research, all researchers of the current paper analysed the interviews scripts and compared these with the literature to arrive at a selection of nine key variables that served as basis for our taxonomy. In Table 1, we present the measures that were included as basis for the classification of the decision-making SBOs, supplemented with the variables we use for validation purposes and to explore the connection between our typology and the SBOs' cognitive ability.

Table 1 Variables and descriptives (n = 646)

	<i>Description</i>	<i>Mean/Frequency</i>
<i>Classification variables</i>		
(1) Frequency of decision making	The number of decisions that the SBO had made in the last three years	2.8
(2) Dependence	The SBO was influenced by other persons (like employees, family or business contacts) in his/her decision-making process; coded 1, otherwise, coded 0 (independence has the value 0)	0.77
(3) Innovativeness	At the time of the survey, the SBO had new ideas or plans that would possibly lead to a new strategic decision; coded 1, otherwise, coded 0	0.47
(4) Information search	The SBO proactively searched for information to support the decision-making process; coded 1, otherwise, coded 0	0.66
(5) Consideration of alternatives	The SBO considered other possibilities or alternatives; coded 1, otherwise, coded 0	0.50
(6) Perceived risk	The SBO perceived risks in the decision-making process; coded 1, otherwise, coded 0	0.35
(7) Problems/Bottlenecks	The SBO encountered problems or bottlenecks during his/her decision-making process; coded 1, otherwise, coded 0	0.64
(8) Economic situation	The SBO felt that the economic situation influenced his/her decision; coded 1, otherwise, coded 0	0.44

Table 1 Variables and descriptives (n = 646) (continued)

	<i>Description</i>	<i>Mean/Frequency</i>
<i>Validation variables</i>		
(9)	Expenses	Expenses involved with the realisation of the decision; coded:
	• (<10,000 euro)	19%
	• (10,000–<25,000 euro)	7%
	• (25,000–<100,000 euro)	22%
	• (100,000–<500,000 euro)	28%
	• (500,000–<2,500,000 euro)	19%
	• (>=2,500,000 euro)	5%
(10)	Type of decision	The nature of the decision that was made; open-ended questions coded:
	• (cooperation or takeover)	15%
	• (organisational change)	46%
	• (development of new products or concepts)	14%
	• (other type of investment)	25%
(11)	Realisation of new-to-the-industry innovations	In the past three years, the SBO's firm had new product or process introductions that were new to the industry; coded 1, otherwise, coded 0
		0.27
(12)	Cooperation status	At the time of the survey, the SBO's firm cooperated with other parties (<i>e.g.</i> , other firms, research institutes) to developed innovations; coded 1, otherwise, coded 0
		0.51
<i>Cognitive ability</i>		
(13)	Experience as an SBO	Experience as a small business owner (in years)
		14.6
(14)	Level of education	The highest level of education that has been completed; coded:
	• (primary of high school)	20%
	• (business education)	34%
	• (university or professional education)	46%

The first variable measures the frequency of decision making. The respondents indicated how many strategic decisions they have taken in the last three years. In the pilot study, this was a significant characteristic; some SBOs made strategic decisions very frequently, whereas others only made decisions when they really had to. The frequency of decision making can actually be thought of as an indicator of expertise in decision making and was, therefore, included in our analysis.

As a measure of dependence, the respondents indicated if they felt influenced by other persons (*e.g.*, employees, family, business contacts) when making the decision. According to McGrath *et al.* (1992), entrepreneurs are rugged individualists. Their research suggests that entrepreneurs favour independent action and separation from groups and clans. Yet, the pilot study revealed that the SBOs can depend heavily on

others. Sexton and Bowman (1985) state that entrepreneurs differ in their need for autonomy and can, therefore, be expected to vary in their support from others, or to conform to their norms.

The third variable relates to the innovativeness of the SBO. The telephone survey focused on a single important decision that had been taken in the past. However, the survey also inquired for any new plans that would ask for a strategic decision in the near future. We regarded this question as a measure of innovativeness, which could be another distinguishing variable. Entrepreneurs are generally found to be more innovative than career professionals (McGrath *et al.*, 1992) but among the entrepreneurs, one can easily find the persons with different levels of innovativeness (Shane, 2003).

The fourth variable relates to information search. The respondents indicated if they had actively searched for information to support their decision-making process. Information search is considered to be among the first critical steps in the decision-making process (Christensen *et al.*, 1994; Shane and Venkataraman, 2000). The SBOs with limited experience may use simplified decision models to guide their search, while the opposite may apply to the experienced SBOs (cf. Gaglio, 1997). Cooper *et al.* (1995) found that novice entrepreneurs sought more information than the entrepreneurs with more entrepreneurial experience, but they searched less in unfamiliar surroundings. Overall, the SBOs can differ in their behaviour of acquiring information and tapping from the contacts that provide them with a flow of information related to opportunities.

Fifth, the pilot had revealed that some SBOs consider many alternatives before deciding what to do. The strategic decision makers in the small firms do not have access to extensive information unlike the managers of the large firms, so they may very well differ in their consideration of alternatives. Busenitz and Barney (1997) state that entrepreneurs do not have all the time in the world to consider all possibilities. Decision makers generally are not looking for the best or optimal option, but for a satisfying solution for a decision task (Simon, 1986).

The next variable we included inquired if the SBO perceived the decision-making process as risky. We regard this question as an indicator of an individual's risk-taking propensity. Some entrepreneurs are risk-averse, while others do not mind taking risks (Jackson *et al.*, 1972). Since decisions must be made within a constrained environment and as it is almost impossible to assess all information, a major goal of decision analysis could be to reduce uncertainty (Harris, 1998).

Another variable that we used to build the taxonomy is the presence of problems or bottlenecks that the SBO encountered during the decision-making process. The pilot study had revealed that on their way to a final decision, the SBOs face different problems. But more importantly, there were strong differences in the problems or bottlenecks that they face (or perceive), like financing, licenses or contracts.

Finally, it is possible that the decision-making process is influenced by and varies with the economic situation. A simple self-rated measure about this phenomenon was present in our database. Some SBOs were faced with a rapidly changing and fast-paced competitive environment, which places demands on the organisations to actively interpret the opportunities and threats when making strategic decisions (Dess *et al.*, 1997). At the same time, today's rapidly changing markets offer little assurance that a decision will not soon prove inappropriate or obsolete (Dickson, 1992). The economic situation is possibly an antecedent of why the SBO has to make a decision.

To validate any taxonomy, one should analyse the variables which were not used to construct the classification, but are likely to differ across its classes (Hair *et al.*, 1995). Our data set contained four variables that were feasible for external validation. The survey recorded the investments to realise the decision (ranging from <10,000 euro up until and including $\geq 2,500,000$ euro). Drawing on an open-ended question, it also distinguished between the four types of decisions related to, namely, cooperation or takeover, organisational change (*e.g.*, the recruitment of new employees, reorganisation, change of management), the development of new products or concepts, or other types of investments (*e.g.*, a new office building, computer machinery). The survey also contained some dichotomous questions on the innovation features of the SBOs' firms. New-to-the-industry innovation was a dichotomous question on the introduction of the products or processes that were new to the industry. This can be regarded as an indicator of radical innovation (OECD, 2005). A cooperation status asked the respondents if their firm cooperated with other parties to develop innovations at the time of the survey. We expected these variables to differ significantly across the groups in our taxonomy, *e.g.*, the expenses to realise the decision are expected to be higher in the groups of SBOs characterised by more frequent decision making, consultations of other persons, high confidence, innovativeness, information search, the consideration of alternatives, the perceived risk, the presence of problems and bottlenecks and a demanding economic situation.

Finally, to explore if the SBOs' decision-making style varies with their cognitive ability, we used two indicators that were part of our database: experience and the level of education. The survey had asked the respondents to provide their experience as an SBO in years. Besides, we disposed of the SBOs' highest level of education (primary or high school versus business education versus university or professional education).

4 Results

To derive a taxonomy of small firm decision makers, we performed cluster analysis. Cluster analysis is the generic name for a wide variety of procedures that can be used to create a classification. Its primary goal is to partition the respondents based on a set of specified characteristics. As cluster analysis is sensitive to outliers, we first examined our data for the outlying observations by calculating the standardised scores for our measures. The values exceeding +3.0 and -3.0 were considered as potential outliers (Hair *et al.*, 1995). After removing them and taking the missing values into consideration, we had 646 remaining observations to build the taxonomy with.

4.1 Descriptive statistics

Table 1 also lists the descriptives for the variables in our analysis. On average, the SBOs in the sample took 2.8 strategic decisions every three years. This implies that, on average, they take a strategic decision almost once a year. About three quarters of the SBOs indicated that they made their decision after consulting other persons. Nearly 50% of our SBOs can be regarded as innovative, *i.e.*, at the time of the survey, they already had new ideas that could induce a strategic decision, indicating that the respondents were 'serial

innovators'. Searching for information appeared rather important to most SBOs, as 66% proactively searched for information. We also checked the correlations between our classification variables. It appeared that although some pairs of variables were significantly related, the correlations revealed no major overlap. The Pearson correlations never exceeded an absolute value of 0.25, indicating that the variables used to develop the typology represent the different aspects of decision making.

4.2 Cluster analysis

We first transformed all the variables into standardised scores. As most of our variables are dichotomous, the similarity between cases may be sensitive to the differences in the measurement scales. Next, we performed an initial hierarchical cluster analysis based on Ward's method with squared Euclidian distances. Milligan and Cooper (1987) conclude that Ward's method generally provides excellent cluster recovery. As this method does not directly provide an acceptable or unacceptable solution, we used the dendrogram and the screen criterion to select a range of cluster solutions that might be feasible (cf. Hair *et al.*, 1995). This suggested between three and six clusters. We subsequently used the initial centroid estimates from Ward's method to perform the various k-means cluster analyses (a nonhierarchical clustering method). As we apply it here, k-means clustering improves the stability of a prespecified number of clusters by assigning cases to the clusters in an iterative process. This generally provides more stable and better cluster solutions (Milligan and Sokol, 1980) and allows for a test of the stability of the various competing cluster solutions by exploring the coefficient Kappa, the chance-corrected coefficient of agreement (Hair *et al.*, 1995). The values of Kappa equalled 0.783, 0.784, 0.878 and 0.806 for our three-, four-, five- and six-cluster solutions, respectively. Thus, our analyses suggested a taxonomy with five types of decision makers as being the most stable.

A table of summary scores across the five types assisted us in interpreting the taxonomy. We labelled the five types of small firm decision makers as the Daredevils, the Lone Rangers, the Doubtful Minds, the Informers' Friends and the Busy Bees (Table 2).

The first group of SBOs distinguishes itself by a high amount of perceived risk in the decision. They seem to be experienced decision makers, as the number of strategic decisions they have made in the past three years exceed the average, just like their innovativeness, information search and the consideration of alternatives. These decision makers also have a high score on the presence of problems or bottlenecks. Because the most striking finding is the large amount of risk that the SBOs perceive, we labelled this cluster as the Daredevils.

The second group makes strategic decisions independent of others. These SBOs seem to dislike consulting other persons who give feedback or influence the decision-making process. They also report few problems and bottlenecks. Furthermore, these SBOs score relatively on variables like information search and the consideration of alternatives. As this group apparently makes decisions on their own, we marked them as the Lone Rangers.

When we take a close look at the third group, we see that the economic situation is an important factor. Besides, the SBOs in this group perceive many problems and tend to consider the alternatives while the average number of strategic decisions in the past three

years is below the average. It looks like these SBOs have a low affinity with making strategic decisions; they prefer to seek alternatives rather than make a decision. For this reason, we called the SBOs in this group the Doubtful Minds.

The SBOs in the fourth group are also modest in their frequency of decision making. While they are all influenced by other persons, the consideration of alternatives is below the average and only a few of them perceive risk. Apparently, the help of other persons is enough to make a definitive decision and to reduce the perceived risks. Hence, these SBOs are called the Informers' Friends.

The fifth group entails some very experienced decision makers. On average, they make several strategic decisions in a single year. At the time of the survey, many of these respondents could mention one or several ideas that would probably ask for another strategic decision in the near future. Compared to the other groups, they seem to be very busy with decision making and do not hesitate to consult others who eventually influence their decisions. We labelled them as the Busy Bees.

4.3 Internal validity

We acknowledge that there are dozens of clustering methods available in the literature, making it possible that the clustering methods provide different results when applied to the same data. Therefore, we have thoroughly investigated the validity of the five types. We first followed Hair *et al.*'s (1995) recommendations to assess the internal validity. As a minimum requirement, the groups of any cluster solution should differ significantly in the variables used to derive the taxonomy. A one-way analyses of variance revealed that all the variables met this criterion. As Table 2 shows, the F-values always exceed the value of 13.7 ($p < 0.001$).

Table 2 The comparison of the five types of decision makers in the small firms

	1: Daredevils (n = 139)	2: Lone Rangers (n = 134)	3: Doubtful Minds (n = 126)	4: Informers' Friends (n = 210)	5: Busy Bees (n = 37)	Total sample (n = 646)	F-value
(1) Frequency of decision making (number of decisions in the past three years)	3.1	2.6	2.2	2.4	5.9	2.8	263.5**
(2) Dependence	97%	0%	96%	100%	100%	77%	1124.8**
(3) Innovativeness	67%	48%	23%	47%	60%	47%	14.5**
(4) Information search	77%	49%	86%	60%	60%	66%	13.7**
(5) Consideration of alternatives	66%	34%	89%	26%	65%	50%	51.3**
(6) Perceived risk	99%	22%	24%	5%	46%	35%	190.7**
(7) Problems/Bottlenecks	88%	46%	80%	46%	81%	64%	29.8**
(8) Economic situation	46%	32%	93%	21%	41%	44%	60.8**

Note: ** $p < 0.001$.

To further assess the robustness, we applied the TwoStep clustering method, which is part of SPSS 11.5 and later. The SPSS TwoStep method is quite different from the traditional and widely recognised hierarchical and k-means clustering methods. Its advantages include the use of log-likelihood distance measures (enabling the modelling of both the dichotomous and continuous variables) and an automatic determination of the number of clusters based on the changes in a distance measure (Chiu *et al.*, 2001; SPSS, 2004). Using these new features, SPSS TwoStep clustering confirmed that a taxonomy with five groups would be most feasible, while the classification of the cases was actually very similar to the groups in Table 2. Although the SPSS TwoStep method can be criticised and is still in its development phase – *e.g.*, Bachter *et al.* (2004) recently showed that it provides poor cluster recovery in the case of variables with different measurement levels – we regard this finding as additional evidence of the internal validity. The results of this analyses are not reported here, but it can be obtained from the authors upon request.

4.4 External validity

To assess the external validity, one should check if the types of decision makers differ on the variables that have not been used in the cluster analysis (Hair *et al.*, 1995). As discussed above, four variables were selected for this purpose, including the expenses to realise the decision, the type of decision and the two innovation indicators at the firm level (new-to-the-industry innovations and the cooperation status). A comparison across the five types of decision makers is presented in Table 3.

All variables had significant differences across the five groups: the χ^2 -tests were significant in at least the 1% level (Table 4). The types of decision makers significantly differ in the expenses that came along with the decision. The Daredevils and the Busy Bees are the biggest spenders: more than 60% of these SBOs have invested at least 100,000 euro. This may contribute to the fact that both types of SBOs perceive risks relatively often. The Doubtful Minds are the most reserved with spending money. This fits well with our earlier conclusion that these SBOs have a low affinity with strategic decisions.

The types of decision makers also differ when it comes to the type of decision. In the total sample, decision making is most often related to organisational change, followed by 'other investments'. For organisational change, we might expect a high degree of dependence, since effective organisational change demands consultations and the participation of other persons (*e.g.*, the employees, middle managers). In this context, we are not surprised to find the Lone Rangers finishing last on the decisions related to organisational change. Another example in support of external validity is the relatively high frequency of the Daredevils on the decisions related to cooperations or takeovers. In the process of organisation development, these are discontinuous and risky events (Jones, 2004) and they, therefore, fit the profile of the Daredevils.

Table 3 The comparison of the five types of decision makers on the validation variables

<i>Variables</i>	<i>1: Daredevils (n = 139)</i>	<i>2: Lone Rangers (n = 134)</i>	<i>3: Doubtful Minds (n = 126)</i>	<i>4: Informers' Friends (n = 210)</i>	<i>5: Busy Bees (n = 37)</i>	<i>Total sample (n = 646)</i>	χ^2 - <i>value</i>
(9) Expenses							43.4*
<10,000 euro (%)	12	20	25	21	12	19	
10,000 to 25,000 euro (%)	3	11	8	6	6	7	
25,000 to 100,000 euro (%)	17	23	24	26	9	22	
100,000 to 500,000 euro (%)	33	31	25	24	27	28	
500,000 to 2.5 million euro (%)	25	11	15	20	34	19	
>2.5 million euro (%)	10	4	3	3	12	5	
(10) Type of decision							42.3**
Cooperation or takeover (%)	22	18	10	13	11	15	
Organisational change (%)	53	34	59	42	43	46	
Development of new products or concepts (%)	12	22	11	11	20	14	
Other type of investment (%)	13	26	20	34	26	25	
(11) New-to-the-industry innovations	38%	24%	30%	18%	38%	27%	21.1**
(12) Cooperation status	65%	31%	56%	48%	65%	51%	36.9**

Notes: ** $p < 0.001$; * $p < 0.01$.**Table 4** The comparison of the five types of decision makers on the cognitive ability indicators

<i>Variables</i>	<i>1: Daredevils (n = 139)</i>	<i>2: Lone Rangers (n = 134)</i>	<i>3: Doubtful minds (n = 126)</i>	<i>4: Informers' friends (n = 210)</i>	<i>5: Busy Bees (n = 37)</i>	<i>Total sample (n = 646)</i>	<i>Test of significance</i>
(13) Experience as an SBO	12.2	16.6	13.6	15.4	14.6	14.6	F = 3.5**
(14) Level of education							
Primary or high school	13%	29%	18%	21%	14%	20%	$\chi^2 = 22.9$ **
Business education (%)	29	35	32	38	31	34	
University or professional education (%)	58	35	49	41	56	46	

Note: ** $p < 0.001$.

The Daredevils and Busy Bees both represent the SBOs in the firms that relatively often introduce radical innovations. The share of the respondents in these two categories that recently introduced products and/or processes that are new to the industry is well above average (38% versus an average of 27%). On the other hand, the Informers' Friends tend not to have such innovations at their disposal. This is well in line with their perceptions of risk, problems and bottlenecks, as we found in Table 3. For the other innovation indicator of cooperation status, the Busy Bees and Daredevils appear to represent the most cooperative group of firms, while the Lone Rangers seem to be the most reserved when it comes to cooperation. In conclusion, the significant differences between the five types support the validity of our taxonomy.

4.5 Cognitive ability

Our survey data contained two more indicators on which our five types of decision makers can be expected to differ. Both indicators relate to the cognitive ability of the SBOs. They include experience (the number of years of experience as an SBO) and the level of education (Table 4).

Table 4 shows that the Lone Rangers are the most experienced of the decision makers, while the Doubtful Minds and Daredevils are below average. This result confirms that the amount of experience affects how strategic decisions are made. Being the most experienced, the Lone Rangers probably feel most comfortable with making a decision on their own and are reluctant to let others influence their decision-making process. On the other hand, the Doubtful Minds could search for information to support the decision-making process because they are less experienced. The Daredevils seem to be somewhat younger and more reckless, a trait that is often found among the less experienced.

The table also demonstrates a correlation between the SBOs' level of education and the type of decision making. Here, the Lone Rangers can be contrasted with the Daredevils and the Busy Bees. In the former group, the SBOs with a modest education level are overrepresented, while in the latter groups, more respondents with a university or professional education are found. It confirms that the highly educated SBOs are more inclined to search for information and consult other people.

5 Discussion and conclusion

As far as we know, this study is the first to present an empirically derived taxonomy of the decision makers in small firms. Drawing on the survey data of 646 SBOs, we developed and validated a taxonomy of the five types of decision makers: the Daredevils, the Lone Rangers, the Doubtful Minds, the Informers' Friends and the Busy Bees.

In the past, much effort has been made to compare the decision-making practices of the managers in large firms with the SBOs in small firms. As many of these studies implicitly assume that the small firm decision makers share similar characteristics, our taxonomy confirms that decision making in small firms is far from being a one-way phenomenon. Our taxonomy shows that some of the most basic features of the decision makers in small firms substantially differ, including the frequency of decision making, innovativeness, the perceptions of bottlenecks, the dependence on other persons and the influence of the economic situation. On the basis of our data, we were

able to clearly distinguish between the five distinct types of decision makers. These results are in line with Julien *et al.* (1997) and Wennekers and Thurik (1999), who proposed that there are distinct types of small businesses and entrepreneurs. The five types could also be sensibly connected with the variables that were not used to develop the taxonomy, including expenses, the type of decision, the innovation indicators and the cognitive ability indicators.

As mentioned in the Introduction, a taxonomy of decision makers is important for anyone who wants to elicit change within a firm or a group of firms. Various groups of stakeholders can be identified here. First, the suppliers of any product, service or technology could take notice and try to identify how the SBOs make decisions. On an attempt to sell a product to a Lone Ranger, for example, one would probably need a different approach in comparison with a Daredevil. Second, one could think of the policymakers who strive to stimulate the small firms towards any kind of behaviour (*e.g.*, innovation, making investments, recruiting underprivileged employees). Third, even the employees who want to 'sell' their ideas to their boss might benefit from knowing what type of decision maker is in charge of their daily work. Each type of decision maker has particular characteristics that one could account for when trying to exert influence. For example, the Daredevils are most willing to take risks and try new things. Here, new product offerings or policy interventions, which deviate from what is common, would be more fruitful than in any other cluster of decision makers. The Lone Rangers seem less willing to have others (family, friends, *etc.*) influence a decision. In comparison, they avoid taking risks but are not very happy to consider alternative options, either. Here, any offer would probably have to be very much in line with the SBOs' preferences, feelings and opinions. The Doubtful Minds are the most eccentric in their consideration of alternative options when making decisions. Combined with their low propensity to take risks, this type of SBO might be sensitive to rational arguments and new alternatives in case of doubt. For the Informers' Friends and the Busy Bees, one could easily think of similar characteristics that are important in trying to influence their decision making.

Of course, this study had some limitations that should be the subject of future research. We first stress that most of the variables that we disposed of to develop the taxonomy were dichotomous questions. This implies a major drawback in our analyses, because the widely recognised methods of hierarchical and k-means clustering give the best results if applied to continuous variables (Milligan and Cooper, 1987). Recently proposed alternatives like SPSS TwoStep clustering are still in their development stage. Their potential to recover cluster structures is still unexplored, so these methods do not find much use in practice yet (Bachter *et al.*, 2004). Although dichotomous questions are not undecidably disadvantageous (they generally result in better response rates and decrease the common-method variance (Churchill, 1999)) and we extensively investigated the validity, we propose that the future taxonomic exercises should try to use more sophisticated measures to see if a similar typology of decision makers can be reproduced.

Another question that rises is how one can identify the types of decision makers in practice. Although we did find some variables, which are feasible for assessment (*e.g.*, the frequency of decisions, expenses, innovation indicators at the level of firms), future research should attempt to further identify the characteristics of the various types of decision makers and provide rules of thumb for their identification.

Finally, we propose that our findings provide an opportunity for a detailed exploration of the differences, antecedents and consequences of the various styles of decision making. One can easily think of other dimensions that would be interesting to explore. Our exploration of the connection with the cognitive ability indicators is just the first example. Another example would be to investigate the association with personality characteristics (*e.g.*, the locus of control, optimism and self-efficacy). The taxonomy also provides a basis for more detailed research into the circumstances and characteristics that precede decision making. For example, we should try to find more details on the types of environments that influence the decisions of the SBOs. The perceived influence of the 'economic situation' could be related to a wide range of factors, including market turbulence, technological development, scientific progress, institutional change or new legislation. Future research should also reveal the consequences for the various types of decision makers in the long run, as decision-making SBOs may benefit differently in terms of growth, profit and satisfaction.

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