



Strategic Decision-Making: Research Mapping from Exploratory Factor Analysis and Multidimensional Scaling

Tomada de Decisão Estratégica: Mapeamento das Pesquisas a Partir da Análise Fatorial Exploratória e Escalonamento Multidimensional

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ABSTRACT

To understand the connection between authors, concepts and theories that address strategic decision-making, in this article the citations and co-citations of works published up to 2014 were analyzed. The sample consists of 489 articles published in international periodicals included in the Web of Science-ISI Web of Knowledge database. The search was conducted using key words that enabled the identification of the highest possible number of articles on the subject in question. Through Multidimensional Scaling (MDS) and Exploratory Factor Analysis (EFA), the conceptual and theoretical relationships involved in these studies were identified. The results show that from 1980 to 2014 three different factors are highlighted: the first has to do with studies on conflict; the second factor is the Top Management Team (TMT) and decision-making; and the third is related to processes. More recently (2013-2014), studies on strategic decision-making are converging towards analysis of conflict and process, composition and control, with Upper Echelon Theory being maintained as the central theory in these studies. This finding is the main contribution of this article.

Keywords: Decision-making; Upper Echelons; Strategy.

RESUMO

Para compreender as conexões entre autores, conceitos e teorias que abordam o tema de tomada de decisão estratégica, neste artigo foram analisadas as citações e co-citações de estudos publicados até 2014. A amostra foi de 489 artigos publicados em periódicos internacionais incluídos na base da Web of Science - ISI Web of Knowledge. A pesquisa foi realizada com a utilização de palavras-chave que possibilitaram a identificação do maior número possível de artigos relacionados ao tema. Por meio do Escalonamento Multidimensional-MDS e da Análise Fatorial Exploratória-EFA foram identificadas as relações conceituais e teóricas envolvidas nestes estudos. Os resultados demonstram que de 1980 a 2014 três diferentes fatores se destacam:

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o primeiro relacionado com estudos sobre conflitos; o segundo fator ligado ao *Top Management Team-TMT* e a tomada de decisão; e o terceiro relacionado aos processos. Também foi identificado que mais recentemente - de 2013 a 2014 - os estudos sobre a tomada de decisão estratégica estão convergindo para a análise de conflito e processo, composição e controle, mantendo-se a Teoria do Alto Escalão como a teoria central nesses estudos, sendo esta a principal contribuição deste artigo.

Palavras-chave: Tomada de decisão; Alto Escalão; Estratégia.

1. INTRODUCTION

Strategic decision-making is an important and recurring theme in business literature, as the success (or lack thereof) of an organization is directly related to decision-making by its managers. Badly made decisions can lead to negative consequences in the short, medium and long term. However, understanding decision-making at the strategic level can be highly complex, as it involves a series of variables that are often difficult to identify and measure (Amason, 1996; Cohen, March, & Olsen, 1972; Eisenhardt & Bourgeois, 1988; Sun & Shin, 2014; Ribeiro, 2015).

Upper Echelons Theory, developed by Hambrick and Mason (1984), is central to these studies. It links the characteristics of executives to strategic decision-making. These characteristics can be observed from psychological or observable perspectives (Chatterjee & Hambrick, 2011; Giberson et al., 2009; Hambrick, Humphrey, & Gupta, 2015; Wiersema & Bantel, 1992). The psychological perspectives are related to cognitive aspects such as individual experiences, personality and values (Bromiley & Rau, 2016; Khanna, Jones, & Boivie, 2014). The observable perspectives include elements such as age, functional tracks, experiences, education, socio-economic roots, financial position and the heterogeneity of groups of executives (Bantel & Jackson, 1989; Finkelstein & Hambrick, 1996). As each person interprets a situation differently, these characteristics can shape decision-making in different ways (March & Simon, 1958).

In addition to the characteristics of decision makers, process and conflict are also recurring dimensions in studies on the theme. Regarding the decision-making process, Eisenhardt and Bourgeois (1988), Bourgeois and Eisenhardt (1988) and Eisenhardt and Zbaracki (1992) investigated the role of politics in this process. The authors claimed that the actors involved play a fundamental role in decisions. Conflict is also highlighted in studies on decision-making, as it is inevitable in groups and organizations due to the complexity of organizational life (Renshon & Kahneman, 2017). Thus, it is of fundamental importance to understand how Upper Echelons Theory relates to these concepts.

Seeking to understand the relationships between decision-making studies, this paper analyzed the main authors, concepts and theories addressed in the literature, considering Upper Echelon Theory as central to these studies. For this purpose, the main published works and the most prominent authors in this field of study have been identified. The article is based on the following research question: What are the main dimensions investigated in the field of strategic decision-making?

The research procedures are, in part, similar to the studies of Serra, Serra and Tomei (2014) and Pinto, Guerrazzi, Serra and Kniess (2016). For this study, the works published in the ISI - Web of Science database for all the periods available in the base up to the year 2014 were analyzed. The sample was made up of 489 articles in which the analyses indicate the existence of

three different groups of works for the total period of publications. These groups investigate the dimensions of conflict, top-management team (TMT) and decision-making, and process. Separate analyses of the periods of 1980-2002, 2008-2012 and 2013-2014 were also conducted, and we observed an evolution of the theme.

This article is divided into six sections. Following this introduction, Section 2 contains a literature review. The third section discusses the method that was employed. The fourth contains an analysis of the results. The results are discussed in the fifth section, and the work is brought to a conclusion in Section 6.

2. RESEARCH ON STRATEGIC DECISION-MAKING

Several elements are observed in strategic decision-making studies: the environment and decision process, conflicts, policy, models and individual characteristics. The environment has a close relationship with strategic decision-making. A very competitive or dynamic environment can create temporary advantages, which also requires high-speed decision-making (Chen, Lin, & Michel, 2010). In this context, the decision maker plays a central role in organizational direction to overcome uncertainties caused by the competition and environmental dynamism (Heavey, Simsek, Roche, & Kelly, 2009).

In a high-speed environment, politics can interfere in how quickly decisions are made, slowing down the process (Eisenhardt & Bourgeois, 1988). Strategic decision-making means reallocating organizational resources. Thus, politics influences decisions because those involved almost always have their own interests, and there are often divergences among members of the organization, including the top managers (Allison, 1971).

Several studies on decision-making have concentrated on analyzing conflicts between groups. These conflicts can be observed through two perspectives, task conflict and emotional conflict. Task conflict is a condition in which the members of a management team disagree over a certain task, such as organizational goals or decisions related to key areas. Emotional conflicts occur when there are confrontations, characterized by the existence of frustration, anger and other negative feelings (Pelled, Eisenhardt, & Xin, 1999). Nevertheless, there are many difficulties involved in distinguishing the type of conflict, be it task or emotional. This occurs because all of these forms appear to have a considerable number of issues related to emotions (Jehn, Greer, Levine, & Szulanski, 2008).

Decision-making models are also much explored in research (Eisenhardt & Bourgeois, 1988; Lindblom, 1959; Queiroz, Reis, & Rocha, 2016; Ribeiro, Serra, & Serra, 2016; Serra et al., 2014; Simon, 1944; Yoshida, Wright, & Spers, 2013). Despite advances in research in this field, the subject continues to warrant deeper theoretical research (Kauer, Waldeck, & Schäffer, 2007). To analyze this relationship between individuals and decision-making, it is fundamentally important to analyze the characteristics of decision makers.

Although the importance of people in decision-making is well known, the minds of strategists for a long time were considered almost inaccessible to researchers, a black box (Maciel, Hocayen-da-Silva, & Castro, 2006). Such analysis is the basis of the upper echelons theory developed by Hambrick and Mason (1984). The theory shows that the characteristics of decision makers can determine the direction that an organization follows. In this sense, several observable characteristics linked directly or indirectly to strategic decision-making can be found

in the literature. A CEO's tenure, age, experience and formal education are some of the elements that can influence strategic choices (Nielsen & Nielsen, 2011).

A fundamental aspect of Upper Echelons Theory is related to the cognitive bases and values of executives (Medeiros Júnior, Serra, & Ferreira, 2009). However, the psychological background variables are extremely difficult to measure. Thus, the theory suggests that from observable managerial traits, it is possible to predict organizational behavior, since they are acceptable and efficient proxies for measuring psychological elements (Carpenter, Geletkanycz, & Sanders, 2004).

Research on decision-making based on observable variables has expanded. The changes related to how diversity is addressed in corporations has resulted in emphasis on demographics. Even with the large number of studies, studies have yet to provide clear results (Bell, Villado, Lukasik, Belau, & Briggs, 2011). This is due, at least partly, to issues related to the environment, the business context and the cognition of the organization's members, which may interfere in how each one interprets and processes information (Hambrick & Mason, 1984). Therefore, studies based on this theory continue to constitute a wide field of scientific research.

3. METHODOLOGY

For this study, we used the Web of Science database because it is one of the most widely used in applied social sciences and aggregates the main journals that address strategic decision-making. The search and save formats available on this database also facilitate the analysis phase through the Bibexcel Software used in data processing.

We used a series of keywords related to strategic decision-making, in accordance with Serra et al. (2014), adding the term Upper Echelons, in accordance with Ribeiro et al. (2016). This reading resulted in the identification of 489 articles that composed the sample. They were initially analyzed using Bibexcel software, and later using IBM SPSS v.20.

As the objective was to understand theoretical connections, we observed only the relationships found among the main studies that were cited by the 489 articles published up to 2014 (citation analysis). This analysis enabled the identification of the seminal studies and those that had a greater impact on the field, helping to reduce possible bias caused by the choice of a single database. After all the citations were written using Bibexcel Software, a matrix containing the number of joint citations (among the 27 most recurrent studies in the bibliographical references of the 489 articles) was prepared. This allowed a theoretical grouping of the studies by means of factors extracted.

Following an initial analysis of the co-citation of the 489 articles, published between 1980 and 2014 (total period of analysis), three new analyses of the co-citations were conducted, seeking to verify the theoretical evolution of this field. One of these dealt only with the 145 articles published between 1980 and 2007. Another included only the 167 articles published from 2008 to 2012. The last included the publications for 2013 and 2014. In these last two years, 177 articles were published. The criteria for delimiting the periods were defined from the evolution of the publications.

The main clusters were identified through Exploratory Factor Analysis (EFA). To Tabachnick and Fidell (2001), EFA seeks to describe, summarize and group correlated variables. For the analyses of all the periods, the adequacies of the values of Communalities > 0.5 , KMO > 0.5 , Bartlett $p < 0.05$, Variance Explained $> 60\%$ and Cronbach's Alpha > 0.6 were observed.

Although there is no consensus on this, these values have been deemed acceptable for the use of EFA (Hair, Black, Babin, Anderson, & Tatham, 2005; Pett, Lackey, & Sullivan, 2003).

The Multidimensional Scaling (MDS) technique was also used to facilitate the graphic visualization of the extracted factors. MDS is an exploratory technique that allows the proximities and distances between objects or persons to be represented in a reduced dimensional system. It can be combined/compared with other exploratory techniques, including EFA (Marôco, 2011). Recently, these techniques have also been used in other studies (Guerrazzi, Brandão, Campos Junior, & Lourenço, 2015; Pinto et al., 2016). Figure 1 shows the steps used in the analysis.

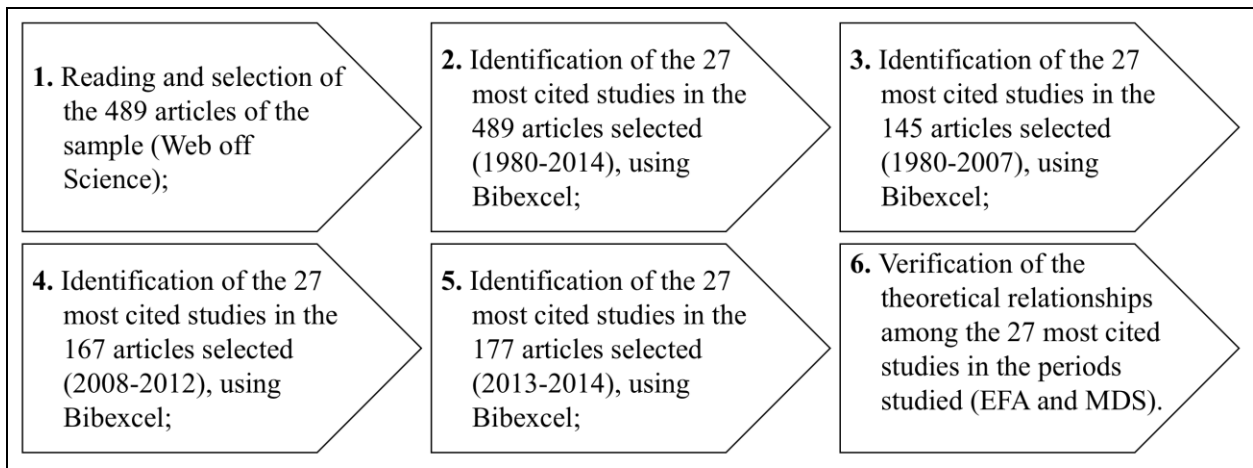


Figure 1. Synthesis of the method

4. RESULTS

Initially, the evolution of studies involving strategic decision-making was identified. The results obtained from the Web of Science database for all the years available up to 2014 enabled us to identify the number of publications for each year. The results showed an increase in the number of published articles. Figure 2 shows that the most significant increase occurred in 2013 and 2014. In 2012, there were 45 publications. In 2013, this number rose to 82 and to 95 in 2014.

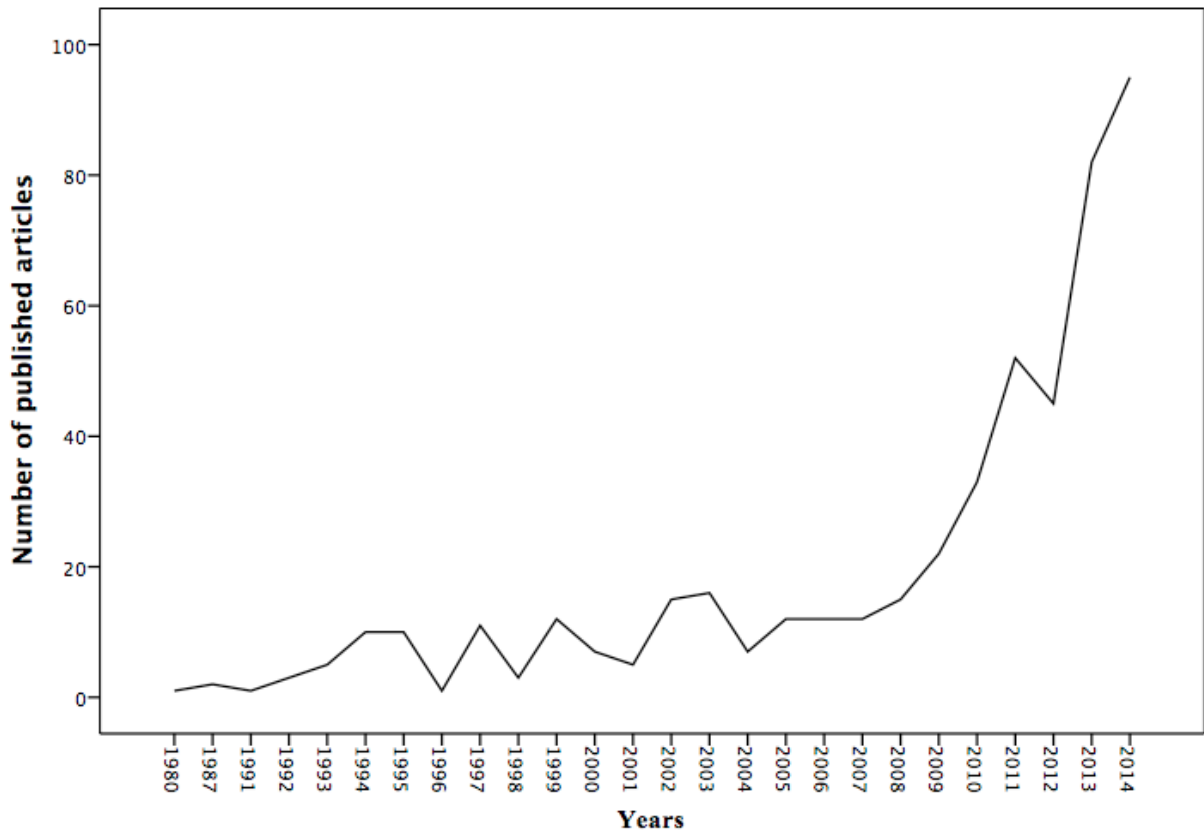


Figure 2. Evolution of publications on Decision-making

A list of the most frequently cited authors in the articles identified is shown below. The cut was made based on the 27 best positioned on the list. Table 1 shows the number of citations of each work and the percentage of citations in relation to the 489 articles used as a sample.

Table 1. Most frequently cited authors in the studies on decision-making

N	Authors	Citations (n)	Citations (%)
1	(Hambrick & Mason, 1984)	120	24.5%
2	(Amason, 1996)	103	21.1%
3	(Bantel & Jackson, 1989)	62	12.7%
4	(Eisenhardt, 1989b)	61	12.5%
5	(Eisenhardt & Bourgeois, 1988)	61	12.5%
6	(Finkelstein & Hambrick, 1996)	42	8.6%
7	(Jehn, 1995)	41	8.4%
8	(Amason & Sapienza, 1997)	36	7.4%
9	(Eisenhardt & Zbaracki, 1992)	36	7.4%
10	(Carpenter, Geletkanycz, & Sanders, 2004)	35	7.2%
11	(Finkelstein, 1992)	33	6.7%
12	(Bourgeois & Eisenhardt, 1988)	33	6.7%
13	(Eisenhardt & Schoonhoven, 1990)	31	6.3%
14	(De Dreu & Weingart, 2003)	31	6.3%
15	(Hambrick, 1994)	30	6.1%
16	(Finkelstein & Hambrick, 1990)	30	6.1%
17	(Fredrickson & Mitchell, 1984)	29	5.9%
18	(Carpenter & Westphal, 2001)	28	5.7%
19	(Hambrick, Cho, & Chen, 1996)	26	5.3%
20	(Jehn, 1997)	26	5.3%
21	(Dean & Sharfman, 1996)	26	5.3%
22	(Jehn, Northcraft, & Neale, 1999)	26	5.3%
23	(Pelled et al., 1999)	26	5.3%
24	(Fredrickson, 1984)	25	5.1%
25	(Hambrick, 2007)	23	4.7%
26	(Baysinger & Hoskisson, 1990)	23	4.7%
27	(Schweiger, Sandberg, & Rechner, 1989)	23	4.7%

The most frequently cited work is that of Hambrick and Mason (1984), on Upper Echelons Theory. Other studies that are cited in over 10% of the studies in question are Amason (1996), Bantel and Jackson (1989), Eisenhardt (1989b) and Eisenhardt and Bourgeois (1988).

The 27 studies were chosen from a list of 36 selected studies. However, nine studies were removed from this analysis: the book of Cyert and March (1963) on the theory of the firm; the book by Aiken and West (1991), which is on linear regression; Fama and Jensen (1983), analyzing the separation of property and control (problems of agency); the work of Dess and Davis (1984) on competitive strategies; the study of Baron and Kenny (1986), a conceptual article addressing moderation and mediation in social studies; Jensen and Meckling (1976), which is another study on agency theory; Bliese (2000) on multilevel theory; an article on agency theory by Eisenhardt (1989a); and a study by Pfeffer and Salancik (1978) on resource dependence theory. These studies, despite including concepts and theories that influence the field of studies on strategic decision-making, could interfere in the results because Upper Echelons Theory was the focus of the study.

To verify the theoretical and conceptual relationships between the 27 studies selected, a co-citation matrix using Bibexcel software was prepared. In this matrix, each study was related to the other twenty-six. From this matrix, an Exploratory Factor Analysis (EFA) was conducted, using the Main Components Method (MCM) with Varimax rotation. This method enables the

reduction of a group of variables to a smaller set according to their similarities (Hair et al., 2005). Three factors were identified, as shown in Table 2.

Table 2. Co-citation Factor Analysis

Authors	Factor 1	Factor 2	Factor 3
(Jehn, 1997)	0.887		
(Amason & Sapienza, 1997)	0.865		
(De Dreu & Weingart, 2003)	0.857		
(Pelled et al., 1999)	0.848		
(Jehn et al., 1999)	0.816		
(Jehn, 1995)	0.747		
(Hambrick, 1994)	0.731		
(Hambrick et al., 1996)	0.723		
(Schweiger et al., 1989)	0.715		
(Finkelstein & Hambrick, 1990)		0.849	
(Finkelstein & Hambrick, 1996)		0.805	
(Finkelstein, 1992)		0.775	
(Carpenter et al., 2004)		0.759	
(Hambrick, 2007)		0.750	
(Eisenhardt & Schoonhoven, 1990)		0.690	
(Bantel & Jackson, 1989)		0.628	
(Eisenhardt & Zbaracki, 1992)		0.593	
(Amason, 1996)		0.421	
(Baysinger & Hoskisson, 1990)		0.407	
(Fredrickson & Mitchell, 1984)			0.862
(Dean & Sharfman, 1996)			0.848
(Fredrickson, 1984)			0.815
(Bourgeois & Eisenhardt, 1988)			0.744
(Hambrick & Mason, 1984)			0.570
(Eisenhardt & Bourgeois, 1988)			0.559
(Eisenhardt, 1989b)			0.533
Cronbach's Alpha	0.932	0.891	0.857
Accumulated Variance (%)	25.0	46.6	65.7
Extraction Method: Principal Component Analysis.			
Rotation Method: Varimax with Kaiser Normalization.			

The three factors explain 65.7% of the total variance of the model; and, of the 27 works, only the study of Carpenter and Westphal (2001) was not linked to any of the factors. The model presented values (Communalities > 0.5, KMO = 0.586, Bartlett $p < 0.05$). The first factor accounts for 25% of the explained variance, with nine works included. The second factor has 10 works, accounting for 21.7% of the variance. The third factor explains 19% of the variance, as shown in Table 2.

Table 3. Description of studies

Jehn (1997) studied conflict using a qualitative approach to find that conflict affects performance and satisfaction negatively.	Conflict
Amason and Sapienza (1997) analyzed the relationship between team size and cognitive conflict and affective conflict.	
De Dreu and Weingart (2003) conducted a meta-analysis of relationship conflict, task conflict and their impact on team performance and satisfaction of team members.	
Pelled et al. (1999) studied how diversity and conflict influence the financial performance of a company.	
Jehn, Northcraft and Neale (1999) analyzed the effect of diversity and conflicts on different areas of work.	
Jehn (1995) investigated the up side and down side of intra-group conflicts.	
Hambrick (1994) analyzed the norms of interaction and communication in groups.	
Hambrick, Cho and Chen (1996) studied the influence of the heterogeneity of the TMT in relation to the competitive aspects of the organization.	
Schweiger et al. (1989) investigated three forms of decision-making: consensus, dialectical inquiry and devil's advocacy.	
Finkelstein and Hambrick (1990) investigated tenure and its influence on persistence and conformity.	TMT and Decision-making
Finkelstein and Hambrick (1996), Carpenter, Geletkanycz and Sanders (2004) and Hambrick (2007) reviewed studies on decision-making in top management.	
Finkelstein (1992) analyzed the power of a position.	
Eisenhardt and Schoonhoven (1990) investigated the characteristics of the team and the influence on results in a technology sector.	
Bantel and Jackson (1989) looked at the relationship between team composition and innovation capability.	
Eisenhardt and Zbaraki (1992) studied the role of politics in the decision-making process.	
Amason (1996) analyzed the effect of conflicts (task conflict and cognitive conflict) on organizational results.	
Baysinger and Hoskisson (1990) investigated the composition of the Board of Directors and strategic control.	Process
Fredrickson (1984) and Fredrickson and Mitchell (1984) investigated the relationship between comprehensive processes and their relationship with performance in stable and unstable environments.	
Dean and Sharfman (1996) analyzed the decision-making process from a relational and political perspective.	
Bourgeois and Eisenhardt (1988), Eisenhardt and Bourgeois (1988) and Eisenhardt (1989b) also investigated the role of politics in the decision-making process.	
Hambrick and Mason (1984) presented the Upper Echelons Theory.	

As the works identified for this first factor include studies related to team relationships and have a broad connection with existing conflicts, this factor was named (Factor 1): Conflict. The second factor is made up of studies with a wide range of approaches (characteristics, review of decision-making, power, politics and conflict) and was named (Factor 2): TMT and Decision-making. With regard to the third factor, although the study of Hambrick and Mason (1984) was included, this article also had factor loadings in the other groups, demonstrating that it is a benchmark for studies using diverse approaches to decision-making. All the other works in this factor are related to the decision-making process, and therefore it was named (Factor 3): Process.

To visualize the theoretical and conceptual relationships between the 26 articles that

resulted from the EFA, we prepared a co-citation map using Multidimensional Scaling (MDS). This analysis enables a graphic view of the elements related to a specific field of knowledge (Small, 1973). The map was generated using IBM-SPSS v. 20 software and is shown in Figure 3.

Figure 3. Co-citation map of researched authors

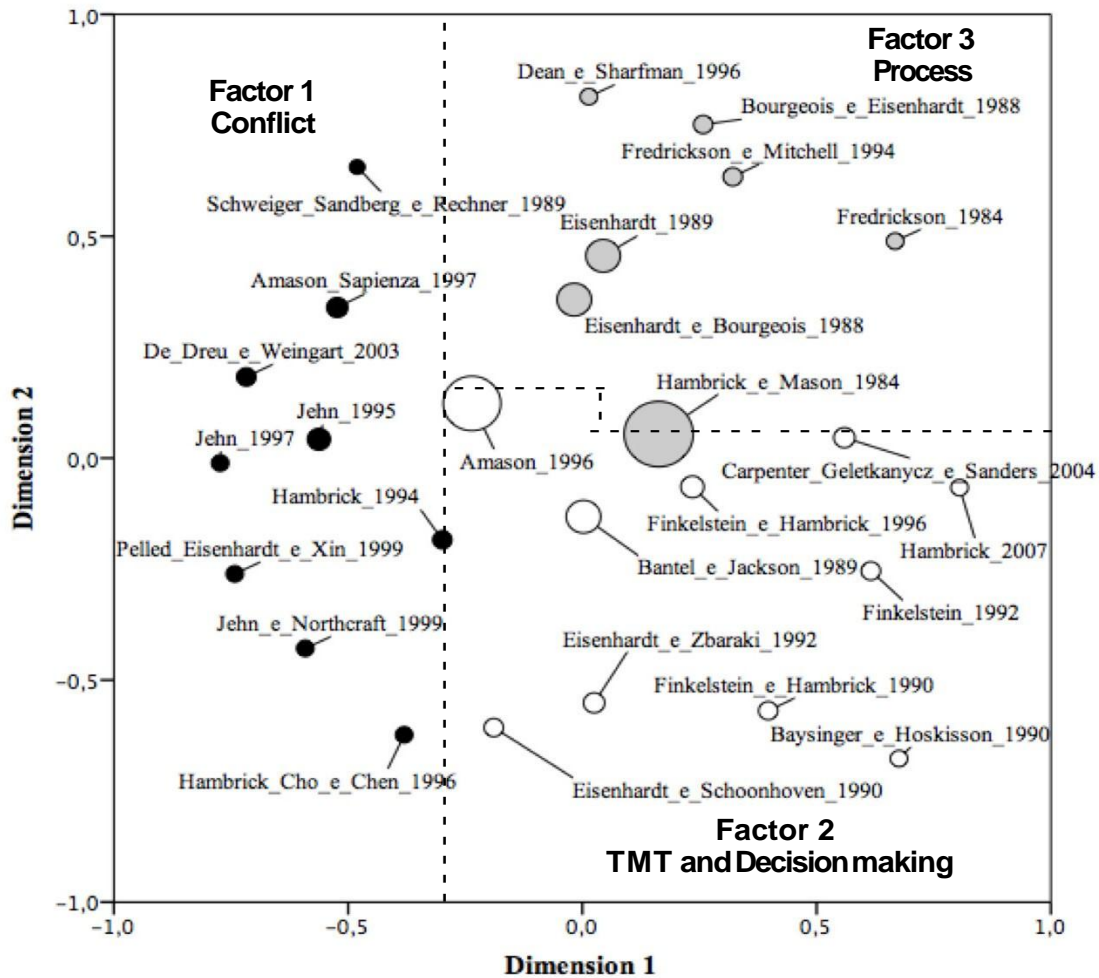


Figure 3 shows the 26 studies resulting from the EFA. The closer the circles are to the respective study, the more frequent the joint co-citation. The diameter of the circles is related to the number of citations of each study. The central studies in this model are those of Hambrick and Mason (1984) and Amason (1996). This graphic analysis strengthens the results of the EFA, indicating that there really are similarities between the studies included in each of the three factors.

Following this analysis, an EFA was performed for each period, as it was decided to analyze three separate periods. The first included all the studies published up to the end of 2007. The second period covered the years 2008 to 2012, and the last period covered the years 2013 and 2014. These periods were chosen based on the evolution of publications, as shown in Figure 2. Another criterion was the maintenance of at least 135 articles in each group, thus assuming the

use of at least five articles for each item observed. Again, the EFA was executed using Varimax rotation. Like the analysis for the whole period under study, for these new observations, the articles were filtered and only the 27 most cited authors and those who published works on decision-making were used. The first period, 1980 to 2007, resulted in four factors.

4.1. Factor Analysis by period (1980-2007)

In this first period, four factors were extracted. The model presented values (Communalities > 0.5; KMO = 0.535; Bartlett $p < 0.05$; Variance Explained = 66.7; Cronbach's Alpha > 0.7) and three studies were not linked to the factors. The first was (Factor 1): Process and conflict, as this factor includes a considerable part of the studies that address the decision-making process, such as the works of Fredrickson and Mitchell (1984), Fredrickson (1984), Bourgeois and Eisenhardt (1988) Eisenhardt and Bourgeois (1988) and Eisenhardt (1989b). Conflict and consensus were addressed in the studies of Dess and Origer (1987), Bourgeois (1980), Dess (1987), Schweiger, Sandberg and Rechner (1989) and Amason (1996).

The second factor, (Factor 2): Characteristics of decision makers, included the studies on tenure by Finkelstein and Hambrick (1990), demographic characteristics by Wiersema and Bantel (1992), the review of decision-making by Finkelstein and Hambrick (1996), diversification and interdependence of business by Michel and Hambrick (1992), and team composition and innovation capability by Bantel and Jackson (1989).

The third factor was named (Factor 3): Upper Echelons Theory as it was made up of the studies of Donald Hambrick, who developed this theory in his 1984 article and expanded the concept in ensuing studies. The fourth and last factor was named (Factor 4): Perspectives on decision-making, because it included diversified studies such as the analysis of politics in decision-making by Eisenhardt and Zbaraki (1992), research on characteristics and performance by Eisenhardt and Schoonhoven (1990), Pelled (1996), who analyzed demography, diversity and conflict, which was also studied by Jehn (1995).

4.2. Factor Analysis by period (2008-2012)

The analysis of the period covering 2008 to 2012 resulted in four factors. The model presented values (Communalities > 0.5; KMO = 0.510; Bartlett $p < 0.05$; Variance Explained = 68.0; Cronbach's Alpha > 0.6), and four studies were not linked to the factors. The first was named (Factor 1): Politics and conflict, as it included the studies of Eisenhardt and Bourgeois (1988), Eisenhardt (1989b), Eisenhardt and Zbaraki (1992), on the role of politics in the decision-making process. The studies of Jehn et al. (1999), Jehn (1997), Amason and Sapienza (1997), Pelled et al. (1999), De Dreu and Weingart (2003), Jehn (1995) and Amason (1996) looked at the effect of conflict on decision-making.

The second factor was named (Factor 2): TMT and decision-making, and included empirical and theoretical studies on upper echelons. The studies of Carpenter et al. (2004), Finkelstein and Hambrick (1996), Finkelstein, Hambrick and Cannella (2009) and Hambrick (2007) are reviews of upper echelons. Finkelstein (1992) concentrated on analyzing power, Finkelstein and Hambrick (1990) related tenure and performance, Fredrickson and Mitchell (1984) analyzed comprehensive processes in unstable environments, and Bantel and Jackson (1989) looked at the relationship between team composition and innovation capability.

The third factor was named (Factor 3): Upper Echelons Theory, as it includes only the studies of Donald Hambrick. The fourth factor (Factor 4): Control and process, includes the studies of Baysinger and Hoskisson (1990), and Hillman and Dalziel (2003), and addresses control in decision-making. Forbes and Milliken (1999) and Bourgeois and Eisenhardt (1988) analyzed the decision-making process. The last period in question was the years 2013 and 2014.

4.3. Factor Analysis by period (2013-2014)

The analysis of the most recent period resulted in only three factors, as occurred with the analysis of the entire period of publications. The model presented values (Communalities > 0.5; KMO = 0.584; Bartlett $p < 0.05$; Variance Explained = 61.7; Cronbach's Alpha > 0.6), and four studies were not linked to the factors. The first factor was (Factor 1): Conflict and process, which mostly included studies that addressed the decision-making process, such as the works of Eisenhardt and Bourgeois (1988) and Eisenhardt (1989b). Publications on conflict included the studies of Amason (1996), Amason and Sapienza (1997), Pelled et al. (1999) and Jehn et al. (1999). Works that revisited decision-making, such as those of Carpenter et al. (2004) and Hambrick (2007), were also included in this factor.

The second factor was named (Factor 2): Upper Echelons Theory, with three of the studies of Donald Hambrick, including the theory developed in 1984. The third and final factor was (Factor 3): Composition and control. It included studies by Adams, Hermalin and Weisbach (2010), who investigated the composition of the Board of Directors, and Adams and Ferreira (2009), who analyzed the diversification of gender in boards, and Adams and Ferreira (2007), who looked at the consultative role and the role of CEO monitoring. CEO performance was also analyzed by Boyd (1995). Hillman and Dalziel (2003) looked at the control of resources in decision-making, and Carpenter and Westphal (2001) analyzed the impact of social networks on the nomination of executives and the impact of international experience on organizational performance and executive compensation.

5. DISCUSSION

The results of this study enable a better understanding of the connections between the authors and the concepts that address strategic decision-making. From the analyses conducted of the citations and co-citations of the 489 articles published in the Web of Science database, we identified that during the period in question (1980-2014), the studies concentrated on three groups of research.

The first factor, Conflict, is a topic of great interests as contradictions remain in the results of the studies conducted on this theme (Elbanna, Ali, & Dayan, 2011; Kellermanns, Walter, Floyd, Lechner, & Shaw, 2011; Renshon & Kahneman, 2017). Several studies on decision-making have concentrated on analyzing conflicts between groups. These conflicts can be observed through two perspectives, task conflict and emotional conflict (Camelo-Ordaz, García-Cruz, & Sousa-Ginel, 2015). Task conflict is a condition in which the members of a management team disagree over a certain task, such as organizational goals or decisions related to key areas. Emotional conflicts occur when there are confrontations characterized by the existence of frustration, anger and other negative feelings (Pelled et al., 1999). Nevertheless, there are many difficulties involved in distinguishing the type of conflict, be it task or emotional. This occurs

because all of these forms appear to have a considerable number of issues related to emotions (Jehn et al., 2008).

Not only can levels of conflict interfere in the decision-making process but they can also have a negative impact on the implementation of strategic decisions. A low level of conflict can streamline the implementation of actions (Schweiger, Sandberg, & Rechner, 1989). Some aspects such as the heterogeneity of the team can create conflicts, as different decision maker profiles can have different attitudes to the risks inherent to the decision-making process (Deutsch, Keil, & Laamanen, 2011; Martín-Ugedo & Minguez-Vera, 2014). In these cases, actions related to greater participation in the decision-making process and improvements in the communication system can reduce conflict (Mazhar, Zaidi, Saif, & Zaheer, 2010).

Conflicts do not necessarily have a negative connotation when they are explicit. They can even encourage openness and acceptance within a group. This ends up having a positive impact on the organization, leading to divergences being accepted by the members, leading to positive effects or at least reducing the negative effects (Jehn, 1995). According to Elbanna et al. (2011), conflict can be destructive or constructive. Therefore, the organization should manage conflict. This management can seek cooperation and competition or even discourage conflict.

The second factor, TMT and decision-making, was the most diverse factor in terms of concepts, as it analyzed issues related to powerful positions, characteristics, policy and process, in addition to conceptual studies on decision-making. These observations are in agreement with those of Serra and Ferreira (2010), highlighting the existence of the great need for an understanding of the relationship between CEOs and top managers and strategic decision-making. This occurs because the management team has the ability to interfere significantly in decision-making that determines the direction that an organization will take (Hsu & Huang, 2011).

In the third factor, Process, the environment has a close relationship with the strategic decision-making process. Changes can lead organizations to achieve a good competitive position rapidly. At the same time, they can also be affected negatively. Thus, a very competitive or dynamic environment can create temporary advantages, which also requires high speed in decision-making (Chen, Lin, & Michel, 2010). In such a context, the decision maker plays a central role in organizational direction to overcome the uncertainties caused by the competition and environmental dynamism (Heavey, Simsek, Roche, & Kelly, 2009).

A formal analysis of the environment is directly related to organizational performance in highly dynamic and less dynamic environments (Mueller et al., 2007). In stable environments, decisions are made after an in-depth analysis of all the alternatives. In dynamic environments, there is a need for rapid changes, and the decision-making process may involve more shallow analyses and fewer strategic alternatives (Bonn & Rundle-Thiele, 2007).

Regarding the factors extracted for different periods, we noted that some dimensions remained present throughout all the periods in question. Conflict and processes were widely researched in all three periods, and Donald Hambrick's 1984 study remains a central theory for studies on decision-making. In Figure 4, we present an exemplification of the dimensions identified in the three periods under study. An evolutionary tendency can be seen in studies on strategic decision-making.

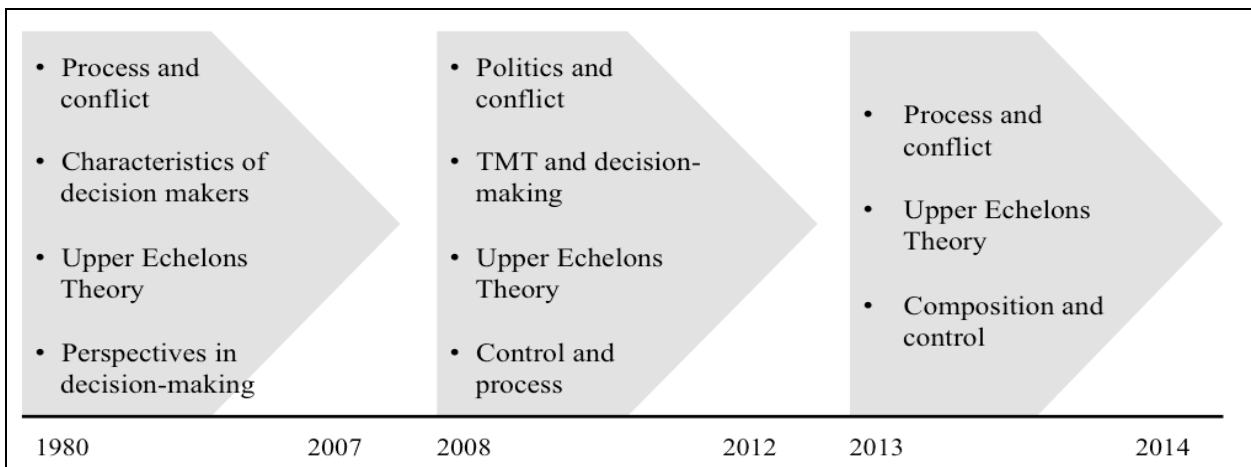


Figure 4. Dimensions of research in decision-making

These observations can be explained because political issues interfere in decision-making process. Policy is formed around small stable coalitions that develop from the demographic characteristics of organizational members (Eisenhardt & Bourgeois, 1988). When power is highly centralized, conflict is submerged in the use of politics (Pfeffer, 1981). The Factor, Composition, stands out in the last period (2013 to 2014). To Muller-Kahle and Lewellyn (2011) difficulties remain when it comes to understanding the influence of team composition, individual characteristics and the behaviors of the members on decision-making. These are some of the reasons why decision-making in top management is still considered a black box (Barroso, Villegas, & Pérez-Calero, 2011; Rivas, 2012; Wincent, Anokhin, & Ortqvist, 2013).

5.1. Limitations and future studies

Although there are limitations related to the choice of a single database, limiting the analysis to 489 articles, the analysis of co-citations provides important information on the study of strategic decision-making. The results are also limited to the presentation of data grouped from the factors extracted from each period, as it is not the purpose of this study to delve into the characteristics of each of the 489 articles and their relationship with the identified theoretical dimensions. Furthermore, Upper Echelons Theory was the central theory of the study, and Brazilian researchers who research the subject were not included in this research. However, we expect that the form of data analysis (analysis through co-citations) also minimized these limitations.

The results reveal that some theoretical gaps remain in these studies. The mapping shows that a deeper theoretical approach is required to understand better the interrelations involving concepts related to the characteristics of members, processes and conflicts. The results demonstrate that these phenomena cannot be treated in isolation. This is an important indicator for the development of further research.

6. CONCLUSION

In this study, the theme of strategic decision-making was researched to understand the connection between the authors, concepts and theories involved in this topic. The citations and

co-citations of the most recurrent authors in 489 published articles were identified. The data obtained from the publications up to the year 2014 in the Web of Science - ISI Web of Knowledge database provided important evidence of the dimensions researched in this field of study. Thus, the main contribution of the study is the indication that even though there are different theoretical dimensions, we have verified that these elements are not treated in isolation. Issues related to conflict, process, individual characteristics, group composition and control are closely linked. These results provide further aid for new researchers studying strategic decision-making to help them understand the multifaceted nature of this field of study.

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