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THE INFLUENCE OF THE STRUCTURE ON THE ATTENTION OF ORGANIZATION MANAGERS

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A INFLUÊNCIA DA ESTRUTURA NA ATENÇÃO DOS GESTORES DE ORGANIZAÇÃO

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THE INFLUENCE OF THE STRUCTURE ON THE ATTENTION OF ORGANIZATION MANAGERS

POR

NAIRANA RADTKE CANEPPELE BUSSLER

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THE INFLUENCE OF THE STRUCTURE ON THE ATTENTION OF ORGANIZATION MANAGERS

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Membro interno: Professor Doutor Julio Carneiro da Cunha

Membro interno suplente: Professor Doutor Marcos Rogério Mazieri

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"Ninguém escapa ao sonho de voar, de ultrapassar os limites do espaço onde nasceu, de ver novos lugares e novas gentes. Mas saber ver em cada coisa, em cada pessoa, aquele algo especial, um objeto singular, um amigo – é algo fundamental. Navegar é preciso, reconhecer o valor das coisas e das pessoas, é mais preciso ainda".

Antoine de Saint-Exupéry

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ABSTRACT

In this thesis, my objective was to understand the aspects of the structural distribution of attention that influence the attention of individuals in organizations. I carried out three distinct and interconnected studies, each with its conceptual development and methods. In the first study, I carried out a bibliometric analysis using matching and cocitation techniques to analyze the knowledge bases, trends, and possible paths for the field of Attention-based View (ABV). This study enabled me to understand the structural and intellectual influences and the evolution and trends in research related to the topic. The second and third studies are considered experiments. In the second study, I evaluated the effect of training (as a proxy for the function) on managerial attention and the individual characteristics of future managers, students from Administration and Accounting courses at federal universities. The professional profile of these individuals influences the choice of information (AOI) for the allocation of care. In the organizational environment (internship), the structural distribution of attention influences the choice of information (AOI). In the third study, looking for external validity, I evaluate the effect of function/position on managerial care and the individual characteristics of professionals working in organizations. It concludes that the professional profile of managers influences the choice of information (AOI) for the allocation of care. This thesis contributes to the advancement of knowledge, considering that, through empirical research, it was possible to identify the aspects of the structural distribution of care that influence the attention of individuals in organizations. Individuals make decisions or develop strategies using the information that the environment in which they live provides, also because of the way they allocate attention in this space, understanding that their initial training becomes less relevant than their professional profile, which is shaped based on their experiences and professional practices. Depending on the area or sector in which the individual works, one piece of information will be perceived and interpreted or taken into account differently from the other because it allocates its attention and has processes of perception and analysis that can be influenced, others not.

Keywords: Attention-based View; Structural Distribution of Attention; Decision Making; Individuals; Organizations.

RESUMO

Nesta tese o meu objetivo foi compreender os aspectos da distribuição estrutural da atenção que influenciam a atenção dos indivíduos nas organizações. Realizei três estudos distintos e interconectados cada um com desenvolvimento conceitual e métodos próprios. No primeiro estudo eu elaborei uma análise bibliometrica utilizando as técnicas de pareamento e cocitação para analisar as bases de conhecimento, tendências e possíveis caminhos para o campo da Visão Baseada na Atenção (VBA). Este estudo me possibilitou compreender as influências estruturais e intelectuais e a evolução e tendências da investigação relacionadas ao tema. O segundo e o terceiro estudo são considerados experimentos. No segundo estudo avaliei o efeito da formação (como proxy para a função) na atenção gerencial e nas características individuais de futuros gestores, estudantes dos cursos de Administração e Ciências Contábeis de universidades federais. O perfil profissional destes indivíduos influencia a escolha de informações (AOI) para a alocação da atenção. No ambiente organizacional (estágio), a distribuição estrutural da atenção influencia a escolha da informação (AOI). No terceiro estudo, buscando a validade externa, avaliai o efeito da função/cargo na atenção gerencial e nas características individuais de profissionais atuantes nas organizações. Conclui que o perfil profissional dos gestores influencia a escolha de informações (AOI) para a alocação da atenção. Essa tese contribui para o avanço do conhecimento, considerando que, por meio de pesquisa empírica foi possível identificar os aspectos da distribuição estrutural da atenção que influenciam a atenção dos indivíduos nas organizações. Os indivíduos tomam decisões ou desenvolvem estratégias utilizando as informações que o ambiente onde estão inseridos fornece, também pela forma como alocam a atenção neste espaço, compreendendo que sua formação inicial se torna menos relevante que o seu perfil profissional que é moldado com base em suas experiências e práticas profissionais. Dependendo da área ou setor que o indivíduo atua, uma informação será percebida e interpretada ou levada em consideração de forma diferente do outro, porque ele aloca a sua atenção e possui processos de percepção e análise que podem sofrer influências, outras não.

Palavras-chave: Visão Baseada na Atenção; Distribuição Estrutural da Atenção; Tomada de Decisão; Indivíduos; Organizações.

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1 Introduction

Research in Applied Social Sciences is criticized for the limited view of strategic phenomena (Miller, 2007). Despite being an academic field that drifts towards specializations and even sub-specializations, it has the challenge of not losing its foundations based on theories already developed (Hambrick, 2004). However, due to their limited scope, resulting from specializations, these theories and paradigms can distract researchers, as they work in a way that borrows from other areas of knowledge. For research to be considered valuable in strategic management, it is necessary to discover new arguments, facts, patterns, or relationships that, convincingly, help to understand better some phenomenon that has social and scientific consequences (Miller, 2007).

Research in the strategic management field places less emphasis on empirical regularities. For a field that seeks the meaning of the real world, it makes no sense to put only theory in front of facts. It is necessary to understand "what" a phenomenon consists of before explaining "why" it occurs. Thus, it will be possible to produce and publish findings of empirical regularities that will construct new theories for testing (Helfat, 2007). Assessing empirical phenomena enables us to analyze organizational problems and phenomena that are not new but that have changed as a result of culture, society, technology, and economics. Therefore, we understand that understanding phenomena may require researchers to develop new interdisciplinary approaches (Ployhart & Bartunek, 2019).

Practices in organizations are not implemented based on published research; instead, they provide data that are the results for publications. It is necessary to observe the nature of the investigated social phenomena, the imprecise and fragmented theorization, the inadequate design of projects and the inevitable dependence on untested assumptions, which favors the idea that complexity is one of the central factors influencing clarity (Yaniv, 2011; Miller & Tsang, 2011). It helps to improve the effectiveness of empirical research in the search for answers aligned with strategies in organizations. Researchers in this area need to employ techniques, not yet usual, such as experiments and quasi-experimental designs to complement traditional research (Miller & Tsang, 2011).

The decision-making process within organizations is carried out by managers who engage in various strategic management processes and practices. They seek to develop and implement better strategies to provide more satisfactory results, influencing financial performance or

competitive advantage. Conducting experiments to analyze the experiences of these subjects who experience the phenomenon in practice can be valuable. It allows capturing the details and richness of strategic management as practiced in real organizations over time (Kouamé & Langley, 2018).

Managers are responsible for organizational decisions at different levels influenced by psychological aspects such as moral understanding, values, personality, ethical behavior, attention, and a sense of justice. All integrated to the cognitive system relating the brain to the social system, which can influence the position in the decision-making process. These aspects, which are little addressed in research in the strategic management field, seem to be fundamental for understanding the phenomena that happen at the macro-level of the organization. Analyzing the behavior of individuals allows us to understand the micro-foundations, that are the microeconomic behaviors that influence business (Barney & Felin, 2013). As researchers in strategic management, we may count on neuroscientific tools that help us analyze subconscious and underlying events to cognition, behavior, and mental activities.

My theoretical choice in this thesis is the Attention-Based View (Ocasio, 1997). It provided me the opportunity to test and analyze the construct of attention in future professionals and active managers using a neuroscientific tool. Ocasio (1997) argues that company behavior results from channeling and distributing the attention of its decision-makers. The author presents three principles: focus on attention, situated attention, and structural distribution of attention. In this thesis, I seek to understand the structural distribution of attention, which is managers' attention in situations conditioned by the organization's structure and social relations. This work is specifically related to their organizational structural function and, eventually, to their previous training.

Therefore, my objective was to understand the aspects that influence the structural attention of managers in associations. It is possible to answer the following study question: What is the attention to structural attention in association managers?

To answer this research question, I carried out three studies. The first was a systematic review supported by the bibliometric technique called bibliographic coupling to analyze the knowledge bases, trends, and possible paths to the field of Attention Based View in an attempt to understand the influences and intellectuals of investigation, as well as the evolution and trends of research to develop a future research agenda for the field.

The second and third studies are empirical, and based on one of the gaps identified in the first study. These are experiments performed with the support of a neuroscientific eye tracking tool

while viewing an image with information about an organization. In study two, the objective was to evaluate the effect of training (as a proxy for the function) on managerial attention and the individual characteristics of future professionals, students of Business Administration, and Accounting courses, at Brazilian Federal Universities. The third study aimed to evaluate the effect of function/position on managerial attention and the individual characteristics of professionals working in organizations.

To propose these objectives, I developed the study presented in Appendix A. Using the bibliometric coupling technique, I aimed to understand how neuroscientific tools are used and discussed in the ongoing research on strategic management.

I divided this thesis into four sections. In the first section, the introduction, the problematization, the general and specific objectives, the justification, and finalized with the work structure with the methodological matrix. In the second section, called Study 1, I present the bibliometric research on Attention-Based View. Empirical studies make up the third section of the document. In the fourth section, I present the conclusions, in the fifth the references, and finally, in the sixth section, I present the appendices of the study.

1.1 Research problem

In organizations, decisions are taken considering the channeling and distribution of individuals' attention. Attention is a process of taking possession by the mind of information or lines of thought that are simultaneously possible, which will only be possible with focus and concentration. It is a process of making choices considering that decision-makers need to focus their energy, effort, and attention on a limited number of problems to achieve sustained strategic performance (Ocasio, 1997).

As it is considered limited, attention activates by signals that are significant to the organization. Still, it also requires the ability of decision-makers to perceive all the signs in the environment that may be strategically relevant. Attention limits ensure that certain types of data go entirely unnoticed, preventing interpretation at all (Shepherd, Mcmullen & Ocasio, 2017). Decision-makers may focus attention on their knowledge and experience, or from something in the environment capturing their attention. However, little empirical research has tested this relationship to understand and describe the influence of organizational structure on individuals' attention.

Organizations are places where data is available, but the challenge is the interpretation process to understand what that data means for the whole organization.

The absence of empirical studies that address the construct of attention in decision-making processes may also be related to the lack of scientific methods in Applied Social Sciences for measuring and analyzing the process. In the last two decades, it was possible to verify the increase of publications in strategic management (APPENDIX A) that use neuroscientific tools to observe cognitive processes. These articles use or cite neuroscientific tools in strategic management and point the lack of experiments in the field addressing decision-making, and the psychological foundations of strategic practice. Since most of what the brain does occurs below the level of our consciousness, some underlying emotional factors shape behavior in organizations and therefore need to be investigated.

To assert that the limited attention span of decision-makers is influenced by the allocation of roles and responsibilities in the organization's structure, we need to understand how and why this allocation occurs and how it is channeled and distributed in different stimuli or to other aspects the situation they experienced. This research problem involves organizational structural and procedural factors but has not yet been answered, tested, or resolved with empirical research.

1.1.1 Research Question

Organizations provide general stimuli for attention channeled by the behavior of decision-makers and consequently stimulate actions. With the aid of a neuroscientific eye tracking tool, I sought to answer the following central research question:

What is the influence of organizational structure on individuals' attention?

1.2 Objectives

1.2.1 General objective

Understand the aspects of the structural distribution of attention that influence the attention of individuals in organizations.

1.2.2 Specific objectives

1. Analyze the knowledge bases, trends and possible paths to the field of (ABV) in an attempt to understand the structural and intellectual influences of investigation, as well as the evolution and trends of investigation in order to develop a future research agenda for the field.

2. Evaluate the effect of previous training (as a proxy for the function) on managerial attention and on the individual characteristics of future managers.

3. Evaluate the effect of the function on managerial attention and on the individual characteristics of professionals working in organizations.

1.3 Justification

Research in strategic management has practical and philosophical problems that make it difficult to test theories. Countless mechanisms act simultaneously, preventing or making it difficult to isolate the effect of each one of them and test the propositions of theories about their behavior. In this sense, although emerging from biological and psychological bases, I understand that social phenomena cannot be explained based on theories at these levels, as they involve mechanisms at various levels, which must be incorporated into the strategic management research (Miller & Tsang, 2011).

This thesis has as its theme the attention to the decision-making process. It is a social phenomenon that emerges from biological and psychological bases, which was analyzed using a neuroscientific tool capable of demonstrating unconscious responses. It is a pertinent study, as it presents the analysis of relevant facts not yet documented and published, counting on a large sample like the one in this thesis. To analyze the results, I considered the human factor as part of the process content and strategy implementation (Hambrick, 2004; Hambrick, 2007).

Ocasio (1997) links the processing of information and the behavior of individuals to the structure of companies. Thus, the distribution of attention is a consequence of the division of labor in social organizations. For both theory and practice, the results of this thesis show that organizations require distributed attention and information processing to perceive, interpret environmental data, and coordinate the activities of individuals and groups.

When well distributed, attention streamlines the decision-making process, facilitating routinization and simplifying tasks. Creating organizational structures and structural positions

capable of channeling and distributing decision makers' attention to specific and relevant questions and answers is a competitive and strategic differential for organizations. Not investigating the attention process or the procedural and communication channels means to insist on the failure to induce decision-makers to channel their attention to unwanted questions and responses to the organization's strategy.

The possibilities of the practical application of the results presented in this thesis and the discoveries of new arguments, facts, patterns, and relationships may help to understand the phenomenon of attention in the decision-making process. It is justified, as the experiments connect with a theory even though they are based on phenomena (Doh, 2015; Miller, 2007).

Research contributions are incremental, theoretical, and method-oriented, with a focus on the observed phenomenon (Doh, 2015). I performed a quantitative research using a neuroscientific tool, allowing for incremental replication (Miller, 2007), in addition to providing results that are part of an interdisciplinary process regarding methods and tools framed as a frontier of knowledge in strategic management.

1.4 Work structure

I present the thesis structure in the Methodological Matrix (Table 1). It includes the justification for distinguishing the studies, including the research question and the general objective of the entire work. The specific objectives, summary of the studies, the hypotheses, the methods, the context and unit of analysis, the procedures and data collection, and the procedures for analyzing the data of each study were presented.

Table 1

Mooring Methodological Matrix

Thesis Research Question: What is the influence of organizational structure on individuals' attention?						
General objective: Understand the aspects of the structural distribution of attention that influence the attention of individuals in organizations.						
Specific objectives	**Studies**	**Hypotheses and/or Propositions**	**Methods**	**Context and Unit of Analysis**	**Procedures and data collection**	**Data analysis procedures**
Analyze the knowledge bases, trends and possible paths for the field of ABV in an attempt to understand the structural and intellectual influences of investigation, as well as the evolution and trends of investigation in order to develop a future research agenda for the field.	**Study 1** Systematic review supported by the bibliometric technique called bibliographic coupling.	[Not applicable]	Systematic review and bibliometric study	Check in the Business Administration field, specifically in the "business or management" sub-field, studies that use and analyzed the Attention-based view. The survey is important as it allows us to define suggestions for future research.	The selection of the sample was performed using the keywords described in the database, namely "attention-based view" and "attention based view". The search yielded 138 articles from 1997 to 2019. The search was refined using the categories of Web of Science Management, Business, Applied Psychology, Experimental Psychology, Multidisciplinary Psychology, Psychology, Biological Psychology, Clinical Psychology, Developmental Psychology, and Psychiatry.	Analysis of bibliographic coupling and cocitation was performed with the support of Bibexcel and SPSS. Performed exploratory and factor analysis.
Evaluate the effect of training (as a proxy for the function) on managerial attention and on the individual characteristics of future managers.	**Study 2** Experiment carried out with the support of a neuroscientific eye tracking tool while viewing an image with	H1: The professional profile of individuals influences the choice of information (AOI) for the	Experimento descritivo e quantitativo.	The research subjects were 73 university students in the penultimate year of undergraduate courses in Accounting and 78 university students in the penultimate year of undergraduate courses in Administration. The choice	Students watched an image using a neuroscientific eye tracking tool. Then they performed a self-report on the information they analyzed.	Performed static T-test analysis, Hotelling's T^2 (H1), Exploratory Factor Analysis for self-report and GLM analysis (H2).

	information about an organization.	allocation of attention. H2: In the organizational environment (internship), the structural distribution of attention influences the choice of information (AOI).	of Accounting students and other courses is justified by the fact that there is no overlap between the mandatory subjects in relation to the Administration course, as they are students from a federal university.		
Evaluate the effect of function/position on managerial attention and on the individual characteristics of professionals working in organizations.	**Study 3** Experiment carried out with the support of a neuroscientific eye tracking tool while viewing an image with information about an organization.	H1: The professional profile of managers influences the choice of information (AOI) for the allocation of attention.	The total number of research subjects was 140 managers, but we analyzed the responses of those who had five years or more of experience in the position or function, totaling 85.	Managers watched an image using a neuroscientific eye tracking tool. Then they performed a self-report on the information they analyzed.	Performed static T-test analysis, Exploratory Factor Analysis for self-report, MANOVA (H1).
Understand how neuroscientific tools are used and discussed in ongoing research on strategy in organizations.	**Appendix A** Bibliometric study using the matching technique.	[Not applicable]	Check in the Administration area, specifically in the "business or management" sub-area, studies that used neuroscientific tools.	It was performed on the Web of Science and Scopus, available in the business or management sub-area. Only articles from journals with an H-Index above 50 and that presented neuroscience*, neurostrategy* and neuroscientific* in their titles, abstracts or keywords were selected. 120 articles from 1990 to 2020 were part of the sample.	Coupling analysis supported by Bibexcel, SPSS and Ucinet software. Performed exploratory and network factor analysis.

Note: Mooring Methodological Matrix adapted from da Costa, Ramos and Pedron (2019).

2 Study 1 - Knowledge Base, Trends and Possible Paths to the Field of Attention-Based View (ABV)

2.1 Introduction

Attention precedes actions. Organizational variables such as culture, context, and economic resources will predict the organizational attentional focus (Ocasio, 1997). Ocasio's Attention-Based View (ABV; 1997) is under development. It is being built by several authors who have analyzed mechanisms and constructs, such as the merger and acquisition integration process (Yu, Engleman & Van de Vem, 2005), and timely and effective management decision-making (Barnett, 2008).

In the last decade, studies addressed topics like: monitoring and the board of directors (Tuggle, Sirmon, Reutzel & Bierman, 2010; Guerrero, Lapalme, Herrbach & Séguin, 2017); the relationship between executive attention standards, the dynamism of the sector, and the performance of corporate recovery in declining companies (Abebe, 2012); senior management's attention to discontinuous technological change (Maula, Keil & Zahra, 2013); shared emotions in the innovation process (Vuori & Huy, 2015); and decisions technologies (Palmié, Lingens & Gassmann, 2015).

At the organization level, studies used ABV to analyze competitive new product development strategies (McCann & Bahl, 2016), organizational conflict (Joseph & Wilson, 2017), and organizational responses to social issues (Ferreira, 2017). Investments in ecological and social environments (Mithani, 2017), the relationship between sustainable development and corporate governance (Galbreath, 2018; Park, 2018), cultural distance and foreign expansion (Hendriks , Slangen & Heugens, 2018), the management of physical impacts of climate change (Pinkse & Gasbarro, 2019), subsidies to research and development and technological collaborations (Bianchi, Murtinu & Scalera, 2019), and how the CEO's narcissism can affect the choice of corporate social responsibility (Chen, Zhang & Jia, 2019), are also part of the research in ABV.

In general, attention refers to the set of elements that occupy the conscience of decision-makers (Dutton, Walton & Abrahamson, 1989). It has been identified as a critical strategic resource in organizations (Ocasio, 1997) and constitutes a broad interdisciplinary research field. Attention can be defined as a concentration of mental activity that receives a limited part of the vast flow of information available. It means that if an individual does not pay attention to a

specific item, that item does not exist in his/her cognitive system (Shomstein, Lee & Behrmann, 2010). Attention is a cognitive process in which the focus is selectively focused on one aspect of the environment, ignoring others, actively processing a limited amount of information (Strayer, Drews & Johnston, 2003; Sternberg, 2000).

In ABV, attention is portrayed as a meta-construction describing the observation, encoding, and interpretation of available stimuli and tracking time and effort, providing a meta-theory of action and organizational adaptation focused on attention (Ocasio, 1997; Ocasio & Joseph, 2005). It links to Simon's (1947) original conception of how organizations structure the attention of individual decision-makers. Therefore, managerial attention is a multilevel process in which individuals, organizations, and the environment interrelate. The information processing by individuals is conditioned by procedures, communication channels, and attention structures in companies (Ocasio, 1997).

Along with the perspective of social cognition and structural processes in decision-making, ABV places the attention-based perspective in a privileged position to explain the relationship between organizational structures, processes, and results. Attention is understood as a socially structured pattern by decision-makers within an organization (Ocasio, 1997; Cho & Hambrick, 2006).

Decision-makers need to solve problems, but they have a limited attentional capacity (Simon, 1947). Performance is largely determined by the managerial allocation of attention, which is a scarce but vital organizational resource. The allocation and distribution of attention is the starting point for understanding organizational behavior (Cyert & March, 1963; March & Olsen, 1976; Simon, 1947; Ocasio, 1997, 2011). To explain the behavior of organizations is necessary to explain how the attention of decision-makers is distributed and regulated, identifying organizational responses through the analysis of how time and effort are structurally distributed in organizations (Ocasio, 1997; Ferreira, 2017).

The concept of attention is used to describe not a single mechanism or phenomenon but a variety of distinct but interrelated mechanisms, processes, structures, and outcomes that operate at various levels of analysis. Understanding the sort of research on attention requires us to recognize that the multiple studies use not only various conceptualizations of attention, but also apply different and sometimes conflicting metatheories to make sense of their data (Ocasio, 2011).

Given the various levels of analysis and concepts employed, research-based on an attentive perspective can rely on a variety of methodologies, including ethnographies, case studies, historical analysis, field experiments, content analysis, and computer simulations. In the case of this sample, I observed that most studies were carried out with secondary data and others are literature reviews, with a minority being empirical studies.

The research on attention is based on different metatheories and on different definitions and understanding of the construct of attention itself. Studies can be carried out with various methodologies and levels of analysis. My objective in this article is to analyze the knowledge bases, trends, and possible paths to the field of ABV. It is an attempt to understand the structural and intellectual influences of investigation and the evolution and trends of investigation to develop a future research agenda for the field. For that, I carried out a bibliometric study using the cocitation and coupling technique.

The intellectual structure identified in this study starts from the decision-making process to analyze the cognitive processes, competencies, capacity, and individual learning. These are all the mechanisms that form the research fronts of the cognitive capacities supported by specific neural networks. The decision-making process is also considered an intellectual structure and the capabilities and organizational routines that support research fronts related to organizational structures and information processing systems.

To discuss all these findings, I made a brief presentation of the subject in the introduction, then we approached some key concepts about ABV through a brief theoretical framework. The methodology is presented below with an explanation of all the steps and methods used to carry out and conclude the study. The knowledge base and the research front, also called AFE factors, are presented in the results that were used to develop the conceptual model of the knowledge base of research fronts in the field of ABV as well as an agenda for future research. The article ends with the conclusion.

2.2 The Attention-based View

The behavioral theory of the firm and managerial cognition are metatheories used to study attentional structures, processes, and results (Ocasio, 2011). Both metatheories and ABV approaches are critical determinants of strategic action and adaptation. Whereas ABV focuses on the structural determinants that drive strategic action and adaptation, approaches to

managerial cognition focus on direct observation and measurement of the cognitive structures of attention that shape strategic decision-making (Ocasio 1997, Gavetti & Levinthal 2000).

To develop the ABV, Ocasio (1997) drew on Simon's (1947) ideas about bounded rationality. ABV is a theoretical approache that seeks to explain how decision-makers pay their attention to issues to understand behavior and outcomes. It is a suitable theory to study how decision-makers, such as boards of directors, can direct attention through a multidimensional outcome (Galbreath, 2018).

Ocasio (1997), in his seminal theoretical essay, defines that company behavior is the result of how the companies channel and distribute the attention of their decision makers, which depends on which questions and answers focus their attention. The author proposed the ABV built on three principles: focus on attention, where managers are selective in their attention to certain issues that guide their decision-making processes; situated attention, the focus of attention of individuals depends on specific contexts; and structural distribution of attention, understanding that the attention paid by managers in the situations faced are conditioned by the structure and social relations of the organization.

The corporate governance literature has been used to explain the behavior of board members or to explore the situational and structural conditions that guide board members' focus of attention (Tuggle, Schnatterly & Johnson, 2010). However, none of these studies tested the main premise of the ABV, stating that the focus of attention of decision makers guides behavior (Guerrero, Lapalme, Herrbach & Séguin, 2017).

Other possible relationships are related to Resource Dependence Theory and ABV. Resources need to be managed and require attention, too; applications of both theories share a focus on executive behavior. Resources jointly determine the distribution of attention from headquarters between domestic market strategies and expansion strategies (Hendriks, Slangen & Heugens, 2018). Although senior management theory asserts that managerial, psychological characteristics can influence a firm's strategic choices (Hambrick & Mason, 1984; Hambrick, 2007), it cannot explain why executives prefer one strategic initiative over another (Chen, Zhang & Jia, 2019). Thus, the relationship between Upper-echelon Theory and ABV is complementary. ABV allows it to be identified and indicates that decision-makers selectively focus on strategic choices (Ocasio, 1997).

The attention processes determine how decision-makers decide and behave. Therefore, which exchange relationships they will choose. It is essential to consider the resources and

exchanges on which you focus your attention (Amalou-Döpke & Süß, 2014). But attention is a resource that is unevenly distributed (Bouquet, Morrison & Birkinshaw, 2009), and can be considered a scarce resource in organizations (Hansen and Haas, 2001).

Attention, however, is a cognitive process that can be directed to a stimulus in two ways. In some moments, the decision-maker concentrates his mental activity on an interesting stimulus in the environment that captured his attention. In this case the processing happens from the bottom-up. Other times, the concentration of mental activity is performed, because the decision-maker wants to pay attention to some specific stimulus, it is the top-down processing (Shomstein, Lee & Behrmann, 2010).

The neuroscience literature categorizes attentional mechanisms into at least three distinct forms of attention, identified through brain imaging techniques and called: selective attention; attentional surveillance; and executive attention (Ocasio, 2011). In organizational studies, to distinguish between the varieties of meaning, Ocasio (2011) classified the concept of attention into three ideal types, based on its focus on structure, process or result, calling it attentional perspective, attentional involvement, and attentional selection.

The attentional perspective is defined as the cognitive and motivational structures that use a bottom-up process to generate greater awareness and focus overtime on relevant stimuli and responses. Attentional involvement is defined as the process of intentional (top-down) and sustained allocation of cognitive resources to guide problem-solving, planning, meaning-making, and decision-making. On the other hand, attentional selection is the emergent result of automatic or intentional attentional processes that result in focusing attention on selective stimuli or responses to the exclusion of others, involving top-down and bottom-up processes (Ocasio, 2011).

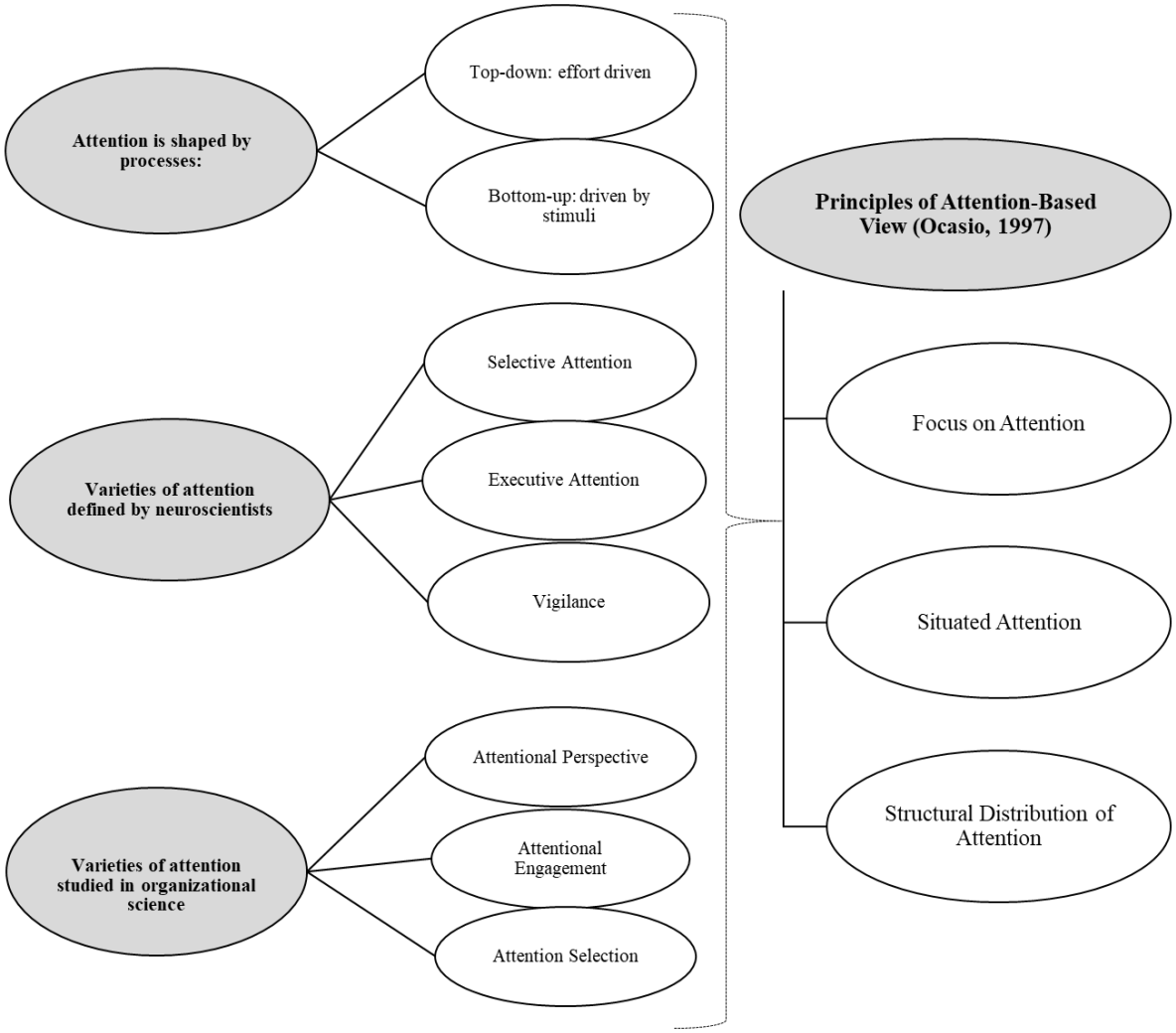
Both the types of attention processes and the variety of denominations are linked to an individual's action in the organization. In Figure 1, I present a summary of the concepts and definitions already used about ABV. Ocasio (1997) developed a model that incorporates the three ABV principles in an integrated framework to analyze ABV in organizations.

In summary, ABV seeks to demonstrate how decision-makers select between stimuli and decide how to respond to selected stimuli, how they allocate their energies, efforts, and time to deal with issues such as strategic opportunities and threats, and the actions they take to address them (Kahneman, 1973; Ocasio, 1997, 2011). The emphasis is on the influence of organizational structure and context in channeling attention to certain stimuli and not others

(Nigam & Ocasio, 2010; Ocasio, 2011; Rerup, 2009). For Ocasio (1997), attention is not only related to knowing whether the stimuli are being noticed but also to how the stimuli are interpreted, since the interpretation of stimuli influences the amount of attention dedicated to these stimuli (Cho & Hambrick , 2006; Pinkse & Gasbarro, 2016).

Figure 1

Synthesis of definitions related to ABV based on Ocasio (1997; 2011)



The ABV emphasizes that several contextual and situational factors influence organizational members' and individuals' attention (Ocasio, 1997, 2011). It reveals the sequential and cyclical nature of attention, where what people get first likely shapes what they get later (Weick, 1979). Although the creation of structural channels may allow interaction between groups can promote the comprehensive sharing of information (Joseph and Ocasio,

2012), the existence of such channels is not sufficient. People can still avoid creating sensitive issues or refuse to listen to others during their interaction episodes (Vuori & Huy, 2015). In these group contexts, specialization is needed because an individual can not handle everything, while integration is needed to combine different points of view (Vuori & Huy, 2015).

2.3 Methods and research techniques

2.3.1 Data collection procedures

I collected the data from a secondary source, considering the bibliometric research. The chosen database was Web of Science, which has search tools that facilitate bibliometric research. I consider that this base is more complete. This study is based on international journals with the impact factor shown in Table 2.

Table 2

List of most cited journals and their impact factors

Journal	Articles qty	ISSN (Online)	Impact Factor (2020)
Strategic Management Journal	12	1097-0266	8.641
Organization Science	8	1047-7039	5.000
Journal Of Business Research	4	1873-7978	7.550
Journal of Business Venturing	4	1873-2003	12.065
Long Range Planning	4	1873-1872	8.802
Advances in Strategic Management	3	0742-3322	0.976
Entrepreneurship Theory and Practice	3	1540-6520	10.075
International Entrepreneurship and Management Journal	3	1554-7191	5.940
Research Policy	3	1873-7625	8.110
Psychological Science	3	1467-9280	7.029

2.3.2 Research sample

The sample selection was carried out using the keywords described in the database, which were “attention-based view”. The search yielded 138 articles from 1997 to 2019. The

search was refined using the categories of Web of Science Management, Business, Applied Psychology, Experimental Psychology, Multidisciplinary Psychology, Psychology, Biological Psychology, Clinical Psychology, Developmental Psychology, and Psychiatry. The seminal article Attention Based View is by Ocasio (1997), and for this reason, articles published from 1997 onwards are part of the sample.

2.3.3 Analysis Procedures

Bibliometrics helps control biases brought about by subjectivity, which is common in qualitative reviews carried out without empirical tools (Ramos-Rodriguez & Ruiz-Navarro, 2004). We also consider that through the statistical analysis, a significant amount of bibliographic data can be considered (Vogel and Güttel, 2013; Zupic & Čater, 2015).

In this study, I used bibliometric techniques called bibliographic coupling and cocitation. Bibliographic coupling is a measure of similarity based on how often two documents in the sample share at least one common reference. That is, documents in a sample are grouped according to their bibliographies overlap. The greater the number of references shared by two documents in the sample, the greater will be the similarity between them (Vogel & Güttel, 2013; Zupic & Čater, 2015). Cocitation makes it possible to measure the frequency with which a pair of articles are cited together. It is helpful to detect paradigm shifts and schools of thought (McCain, 1990; Zupic & Čater, 2015).

Bibliographic coupling analysis was performed first. A co-occurrence matrix (Bernard & Ryan, 2010) was generated in Bibexcel, from the references of each pair of articles in the sample. The cocitation analysis was carried out from the references of the sample of articles used for the bibliographic coupling. To perform the bibliographic coupling, I reduced the sample and only articles with at least 6 loops. The reduced sample result of the coupling was 45 articles. To carry out the co-citation, I used the references of the 45 articles in the bibliographic coupling, I reduced the sample to articles that had at least 6 ties. and we had a total co-citation sample of 62 articles. This procedure, performing the co-citation of the coupling sample, allowed me to verify the intellectual structures that specifically influence the current research agenda represented by the articles.

With the matrix of 45 matching articles and 62 cocitation articles, I used the Exploratory Factor Analysis (EFA) using the SPSS software. As a selection criterion for the number of

components to be retained for analysis, I used the “elbow” method (Cattell, 1966) and also the Kaiser (1960) eigenvalues criterion. Both methods converged to an ideal number of 3 components to be extracted for both bibliographic coupling and cocitation. The three components of paring explain 58.1% of the total variance of the matrix, in the case of cocitation 65%. The KMO of bibliographic coupling is .834 and of cocitation .799. Com a matriz de 45 artigos do pareamento e 62 artigos da cocitação, utilizei a técnica para a redução da dimensão denominada de Análise Fatorial Exploratória (AFE) utilizando o software SPSS. Como critério de seleção do número de componentes a serem retidos para análise empreguei o método do “cotovelo” (Cattell, 1966) e também o critério de *eigenvalues* de Kaiser (1960). Ambos métodos convergiram para um número ideal de 3 componentes a serem extraídos tanto para o pareamento quanto para a cocitação. Os três componentes do paremento explicam 58,1% da variância total da matriz, já no caso da cocitação 65%. O KMO do pareamento é ,834 e da cocitação ,799.

I used an orthogonal rotation, as the possibility of correlation between the components that the oblique rotations allows is not important in the analysis. I chose Varimax with Kaiser normalization among the orthogonal rotations because it maximizes the sum of the load variances, allowing a better analysis of the relationship between the components and the documents that compose them. The load criterion to justify the presence of certain documents in a component was that the component must have an absolute load greater than or equal to 0.4 (De Camargo Guerrazzi, Brandão, de Campos Junior & Lourenço, 2015). For factor analysis, the same matrix was used in the UCINET software. I chose to highlight in different symbols and colors the documents mentioned for each component. In Table 3 we present a summary of this information from the Exploratory Factor Analysis.

Table 3

Exploratory Factor Analysis Information

Total sample of 138	
Bibliographic coupling	45 articles
EFA	3 factors
KMO	,834
Matrix total variance	58%
Sample of the co-citation of the references of the coupling sample	62 articles
EFA	3 factors
KMO	,799
Matrix total variance	65%

I also performed the calculation of the centrality, density, and cohesion of networks. Centrality measures how many connections a node has about other nodes, and the degree of centrality refers to the number of links a node has in relation to other nodes. Those who have more connections may have multiple alternative paths and resources to achieve goals and have a relative advantage. Centrality is calculated by the network as a whole, unlike density and cohesion, where factors perform the calculation.

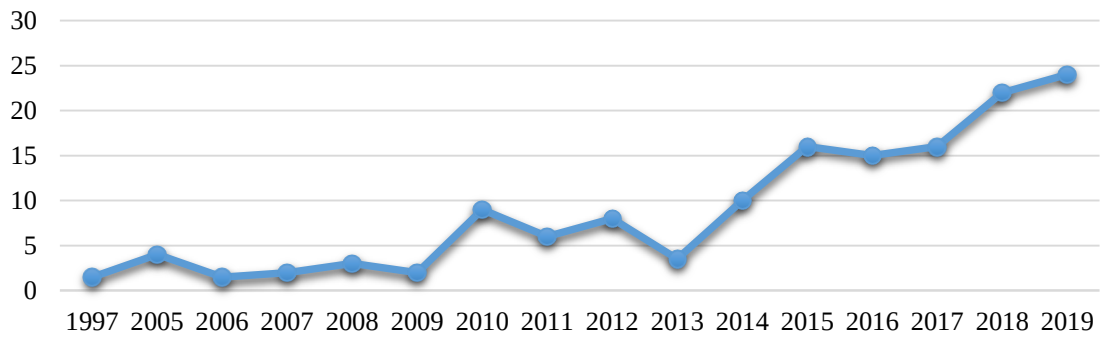
Density is a measure that indicates the level of connectivity within the factor. In most cases, the greater the density, the greater the cohesion within the group. By measuring the centrality, it is possible to verify the most important studies in the sample. At the same time, from the density, it is possible to point to a greater volume of relationships between the studies, making it possible to identify those less involved in the network. Cohesion is also an attribute of a factor that will be highly cohesive if its members are densely interconnected. It indicates to what extent a research subfield seeks an agenda independent of other discourses (Farina, Silva, Da Silva Filho, Da Silveira, Ozaki & Benevides, 2013; Vogel & Güttel, 2013).

2.4 Results

The annual scientific production on ABV started in 1997 with the article by Ocasio (1997) and came into evidence in 2014 and since then it has been in focus for researchers in the area (Figure 2).

Figure 2

Evolution of annual scientific production on ABV



Different reasons can be analyzed to justify the growth of publications in 2014. Mainly the advent of technology and neuroscientific equipment that can support and are fundamental to discoveries in this area where it becomes possible to join points between human interaction and effective organizational practices. As it is a relatively new theoretical approach, with few studies found, they chose to verify the influences of references (cocitation) in articles (bibliographic coupling). We performed a cross-reference analysis in the articles. Since they constitute articles and references, and this structure the approach of an article, this analysis allows us to assess the influence between the basic approaches and the currents of research used to investigate our theme.

2.4.1 Bibliographic coupling analysis

Bibliographic coupling shows the growing fields of publication. It is a measure of similarity, based on the frequency with which two documents in the sample share at least one common reference because the greater the number of references shared by two documents in a sample, the greater the similarity between them (Vogel & Güttel, 2013). This method indicates the research front in a field (Zupic & Čater, 2015), and helps detect trends and possible paths towards a field of publication.

To determine the analysis factors or the research fronts of the theory, we use the EFA. The results indicate the degree to which an article belongs to the factor. The factor represents the subfield or theme (Nerur, Rasheed & Natarajan, 2008), with the articles that are closer together tend to have higher loads in the same factor. The reduction of dimensions united 45 articles out of the 138 found in three factors, presented in Table 4.

Table 4

Analysis of bibliographic coupling factors

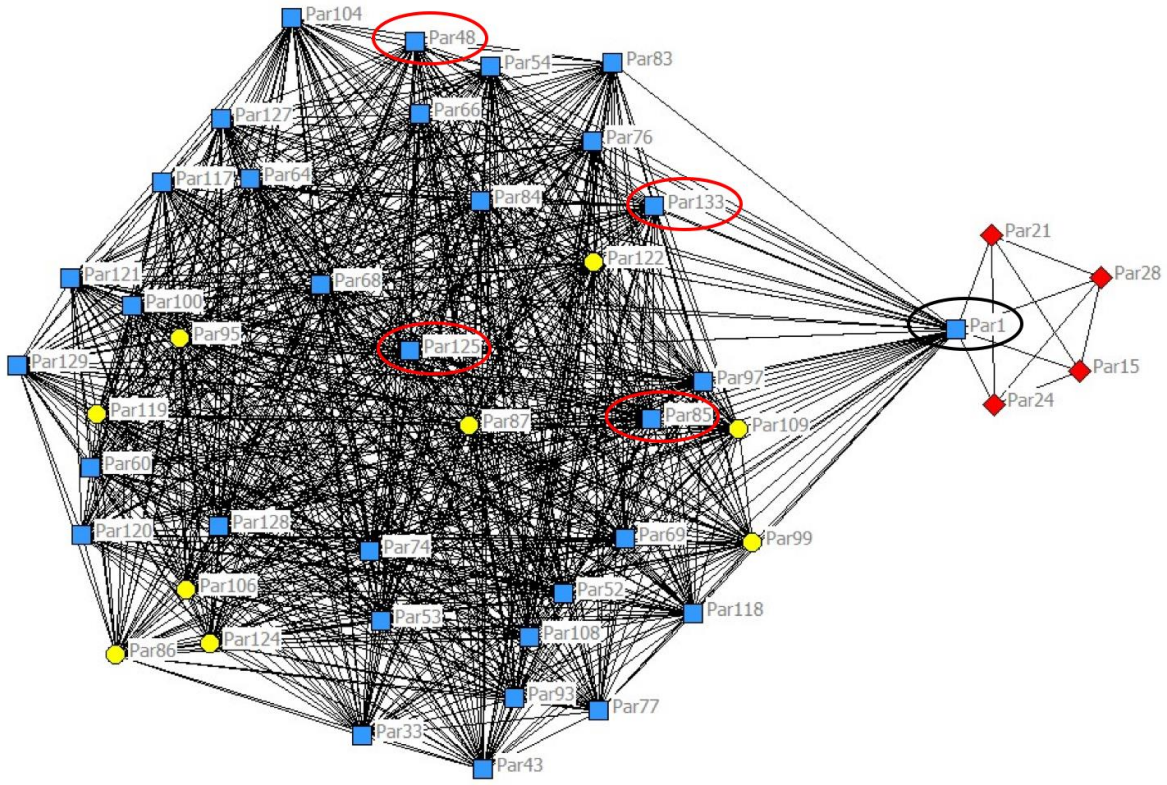
Exploratory Factor Analysis					
	Fators			**Comunalities**	**Cronbach**
	Fator BC1	Fator BC2	Fator BC3	**h2**	**α**
Par68. Greer, Carr and Hipp (2015)	.848	-.002	.000	.719	.968
Par77. Park, (2018).	.832	-.027	-.020	.694	
Par54. McCann and Bahl (2016)	.799	.102	-.076	.655	
Par53. Joseph and Wilson (2017)	.793	.159	-.011	.654	
Par125. Gorgijevski, Holmström Lind and Lagerström (2019)	.792	.250	-.165	.716	

Par85. Guerrero, Lapalme, Herrbach and Séguin (2017)	.786	.191	-.059	.658	
Par66. Galbreath (2018)	.776	.296	.043	.692	
Par43. Plambeck (2012)	.766	-.017	-.104	.597	
Par133. Soemer (2019)	.755	.166	.103	.608	
Par120. Yang, Chen and Zhang (2016)	.753	.357	.145	.715	
Par108. Amalou-Döpke and Süß (2014)	.749	.204	-.129	.619	
Par104. Hendriks, Slangen and Heugens (2017)	.744	.139	.097	.582	
Par127. Chen, Zhang and Jia (2019)	.742	.119	-.223	.614	
Par93. Liu, Wu and Lee (2018).	.725	.418	-,083	.707	
Par83. Oh e Barker (2015).	.661	.380	.215	.628	
Par128. Ma, Kor and Seidl (2019)	.649	.285	-.316	.602	
Par76. Abebe (2012)	.644	.189	.139	.470	
Par97. Pohl, Wolters and Ponseti (2015)	.641	.190	-.107	.458	
Par74. Moors, Germeys, Pomianowska and Verfaillie (2015)	.631	.367	-.067	.537	
Par48. Von Briel, Davidsson and Recker (2017)	.629	.232	-.300	.539	
Par84. Mithani (2017)	.628	.413	-.195	.604	
Par33. Pugliese, Minichilli and Zattoni (2014)	.611	-.007	.181	.406	
Par64. Daniel and Stewart (2016)	.604	-.238	-.270	.494	
Par69. Gress, Anderson and Laws (2011)	.593	-.205	-.297	.482	
Par129. Hughes, Souchon, Nemkova, Hodgkinson, Oliveira and Sy-Changco (2018)	.585	.467	-.069	.564	
Par100. Irwin (2013)	.581	.544	-.041	.635	
Par121. Koulaguina, Drisdelle, Alain, Grimault, Eck, Vachon and Jolicoeur (2015)	.540	.511	-.029	.554	
Par118. Haq (2017)	.522	.394	-.143	.448	
Par60. Pinkse and Gasbarro (2016)	.513	.406	-.152	.451	
Par1. Ocasio, (1997)	.513	.085	.466	.487	
Par117. Kim, Kim, Kim and Cho (2018)	.501	.501	-.173	.532	
Par52. Surroca, Prior and Tribó Giné, (2014)	.500	.380	-.084	.401	
Par106. Deman, Jorissen and Laveren (2016)	.300	.788	-.020	.711	
Par95. Ferreira (2017)	..164	.700	-.154	.541	
Par119. Zappalà, Antfolk, Dombert, Mokros and Santtila (2015)	-.239	.700	-.100	.557	
Par99. Wilson and Joseph (2015)	.414	.690	-.042	.649	
Par109. Bianchi, Murtinu and Scalera (2019)	.434	.667	.134	.651	.860
Par87. Coenen (2012)	.145	.666	-.113	.477	
Par122. Sebrek (2014)	-.083	.652	-.131	.448	
Par86. Palmié, Lingens and Gassmann (2015)	.417	.555	-.223	.531	
Par124. Downing, Kang and Markman (2019)	.432	.505	-.104	.452	
Par24. Maula, Keil and Zahra (2013)	.105	-.035	.910	.841	
Par15. Vuori and Huy (2015)	-.169	-.240	.748	.646	
Par21. Graebner, Heimeriks, Huy and Vaara (2017)	-.114	-.192	.727	.578	.682
Par28. Galbreath (2011)	-.119	-.185	.725	.574	

Figure 3 is the bibliographic matching network. I used the final solution sample of 45 articles (specified in the data collection section and Table 4). The “knots” represent the sample items. Lines represent shared references. The thicker the line between two articles, the more references they share.

Figure 3

Bibliographic coupling network



Note: ■ Fator 1; ● Fator 2; ◆ Fator 3.

Three main groups were formed, considering the overlap with the EFA factors (Table 4). I identified that the central article of the network is by Soemer (2019), Par133, followed by Von Briel, Davidsson and Recker (2017), Par48, Guerrero, Lapalme, Herrbach and Séguin (2017), Par85, and Gorgijevski, Holmström Lind and Lagerström (2019), Par 125. The network metrics are shown in Table 5.

Ocasio's (1997) article, Par 1, links the two large coupling clusters. The results also indicate that Factor 2, despite being originated and part of Factor 1, indicates some differences in ideas from negative factor loads. Factor 3 is an independent factor for the same reason.

Table 5

Bibliographic coupling network metrics

BC netowrk metrics			
	Factor BC1	**Factor BC2**	**Factor BC3**
Cohesion	1.647	0.928	0.784
Density	0.960	0.888	0.750
Centrality	**Par133**, Par48, Par85, Par125		

The factors identified in the EFA were named as follows:

BC1. Cognitive abilities and the decision-making process

BC2. Organizational structures and attention

BC3. Information processing systems, emotions and cognitive structures

Factor BC1. Cognitive abilities and the decision-making process

Simon's work (1947) explained how decision-making in companies is affected by restrictions on managers' cognitive abilities to respond to stimuli and understand information. Therefore, decision processes within organizations are affected by how the organization directs the attention of decision-makers to matters that are considered important (Ocasio, 1997; Simon, 1947). Thus, attention emerged as a meta-construction in organizational studies (Rerup, 2009). Although a company's strategy and resources affect the degree of innovation, investment, or expansion, part of this effect is mediated by the executives' assessment and attention to the triggering event.

Therefore, managerial cognition is a relevant factor in the interpretation of events within organizations (Plambeck, 2012). It is important to understand that the cognition and action of individuals are not predictable based on the knowledge of individual characteristics but are a consequence of the situations that decision-makers experience. Therefore, attention is directly related to the context in which cognition and action are situated. It is a multilevel descending process that combines structure and cognition to explain organizational behavior (Ocasio, 1997; Ferreira, 2017).

There are two forms of cognitive restrictions within organizations, attention dilution, and managerial insight. Managers often receive vast amounts of information that exceeds their cognitive capacity, thus increasing management costs and reducing the quality of management decisions through attention dilution (Liu, Wu & Lee, 2018). As a consequence of an emotional

state, attention and cognitive processes must be analyzed from the perspective that they are structures of the information processing approach, which are individual and are related to emotional contexts and memories (Gress , Anderson & Laws, 2011).

The ways of paying attention, for each decision-making, provide different importance. Visual-spatial attention is important for the maintenance of information in short-term memory (Irwin, 2013). It is used, for example, when decision-makers pay attention to technologies and markets, alleviating the time and effects of myopia in investment decision-making (Yang, Chen & Zhang, 2016). Auditory attention is relevant for perceiving tone and signals presented in complex auditory scenes (Koulaguina, Drisdelle, Alain, Grimault, Eck, Vachon & Jolicoeur, 2015). What will hardly happen in an organization is the use of joint attention, a process by which an observer allocates their attention based on another person's attention to make their decisions (Moors, Germeys, Pomianowska & Verfaillie, 2015).

Thus, it is possible to see that the attention of decision-makers is directed to the general collection, interpretation, evaluation, and sharing of information to plan, develop strategies and options before choosing in the market (Hughes, Souchon, Nemkova, Hodgkinson, Oliveira, Boso & Sy-Changco, 2019). Analyzing cognitive processors provides a more nuanced view of how key strategic resources, knowledge, and attention, drive success (Daniel & Stewart, 2016).

Considering the cognitive abilities of decision-makers, recruitment and selection approaches that mimic the practices (processes) of large companies are positively related to a perceptual measure of the company's performance. The perceptions of founders, owners, managers, or decision-makers about the strategic importance of human resources moderate the relationship of company performance with imitative recruitment practices and growth-oriented selection practices. Thus, company performance is positively associated with the selection emphasis on candidates' ability to grow with the company, their cognitive abilities (Greer, Carr & Hipp, 2015).

Empirical research, such as Greer, Carr and Hipp (2015) found that there is an ideal scenario for ABV in small companies, as managerial attention is more restricted, with less opportunity for decision-makers to delegate responsibilities. It happens because they are close to the team and processes. There is a strategic relevance or importance perceived by the human resources area, which can affect the company's performance.

From the standpoint of decision makers' attention, emerging market multinationals are different from small businesses, particularly about issues that must be addressed or ignored. In

complex situations, such as in foreign markets, the information available often exceeds the decision makers' cognitive abilities to calculate a solution based on more extensive analysis. Thus, their attention is selective and shaped by their individual cognitive schema, which is reinforced rather than renewed by the experience. Cognitive schemas or bases are updated along with the contexts and contents or organizational or environmental stimuli of their experiences (Park, 2018).

Another way of evaluating the attention carried out in multinational companies is related to the relationships between headquarters and subsidiaries, which compete with each other for resources and attention from the headquarters to obtain approval and implement their specific initiatives (Mudambi, 1999; Hansen & Haas, 2001; Haq, 2017). Headquarters, where decision-makers concentrate, receive a plethora of information. Given the constraints of time and resources, they need to be selective about what information they choose to focus on, interpret and act on (Haq, 2017). The challenge facing headquarters is to properly maintain the increased attention by avoiding limited attention to these strategically important subsidiaries and at the same time having active and diversified attention, offering some form of attention to all the different subsidiaries present in the organization (Rerup, 2009; Haq, 2017).

It is necessary to consider that another relevant factor regarding the limited attention of decision-makers towards their subsidiaries is related to time constraints, which is also limited to focus attention on specific questions and answers. Applying this definition to the daily analysis of subsidiaries that belong to headquarters, Gorgijevski, Lind and Lagerström (2019) state that the amount of attention a subsidiary receives depends on numerous factors, such as the structural and relational position of the subsidiary, as well as strategic efforts on behalf of subsidiary managers to attract the attention of headquarters. For the authors, headquarters' acceptance of subsidiary initiatives is a matter of drawing headquarters' attention to various proactive tactics. Formal and informal communication channels are essential in this process and produce information to identify the elements of interactions (Kim, Kim, Kim & Cho, 2018).

It is possible to see with the example of the study by Haq (2017) and Gorgijevski, Lind and Lagerström (2019) that the company's competitive, institutional and regulatory contexts happen both internally and externally and rely on the help of communication channels for inputs a significant role in goal setting (McCann & Bahl, 2016). Thus, a attention structure and processes that place the sustained focus on business growth issues need to be observed. It is necessary to understand that there are cognitive foundations of growth and that how corporate

interventions direct management attention and the identification and advancement of new opportunities in support of growth (Joseph & Wilson, 2017).

On the other hand, attention patterns and an organizational structure interact formally and can cause tensions between decision-makers, and this factor can trigger the design of new sub-units. Within a multidivisional firm, preference takers often differ in their perceptions of opportunities, and orientations for environmental stimuli are regulated by their allocation of attention to above or below signals (Joseph & Wilson, 2017).

Ocasio (1997) states that the most critical actors in organizational attention are the CEO and the leading executives. ABV is relevant to CEO analysis because it can help analyze what issues or aspects the CEO becomes aware of and gets involved. It highlights which issues he will pay attention to. Another important factor is that the CEO's attention structure affects the potential sources of advice he will be engaged. You may need to understand how his attention is structured. CEOs' attention structure also affects how they handle the advice they receive when it is multiple (Ma, Kor, & Seidl, 2019).

Considering the leading executives who are part of the boards of directors, the fundamental mechanism of government in organizations, they are considered to act as monitoring and performance managers, providing advice and access to resources (Pugliese, Minichilli & Zattoni, 2014). But considering the cognitive groups, in which CEOs focus their attention on similar strategic elements when seeking to maximize their company's competitive advantage (Surroca, Prior & Tribó Giné, 2014), board members will not always be involved in monitoring and counseling tasks, which can affect performance internally and externally by regulations, as they affect their behavior, not challenging CEOs if the company is operating profitably (Pugliese, Minichilli & Zattoni, 2014).

Another way of evaluating the attention carried out in multinational companies is the relationships between headquarters and subsidiaries, which compete with each other for resources and attention from the headquarters to obtain approval and implement their specific initiatives (Mudambi, 1999; Hansen & Haas, 2001; Haq, 2017). Headquarters, where decision-makers concentrate, receive a plethora of information. Given the constraints of time and resources, they need to be selective about what information they choose to focus on, interpret and act on (Haq, 2017). The challenge facing headquarters is to properly maintain the increased attention by avoiding limited attention to these strategically important subsidiaries and at the

same time having active and diversified attention, offering some form of attention to all the different subsidiaries present in the organization (Rerup, 2009; Haq, 2017).

It is necessary to consider that another relevant factor regarding the limited attention of decision-makers towards their subsidiaries is related to time constraints. It is also limited to focus the attention on specific questions and answers. Gorgijevski, Lind and Lagerström (2019) state that the amount of attention a subsidiary receives depends on numerous factors, such as the structural and relational position of the subsidiary and strategic efforts on behalf of subsidiary managers to attract the attention of headquarters. For the authors, headquarters' acceptance of subsidiary initiatives draws headquarters' attention to various proactive tactics. Formal and informal communication channels are essential in this process and produce information to identify the elements of interactions (Kim, Kim, Kim & Cho, 2018).

As exchanges are carried out when there is attention on the part of decision-makers, which affects the organization's performance in different ways, analyzing the company's environment is also important. In cases where the organization is in decline and operates in dynamic environments, they tend to improve their return performance when decision-makers focus their attention on sectors related to the market - competitors and customers. But the recovery performance of declining firms appears to be negatively affected by a disproportionate focus on industries related to the input of the task environment, suppliers, and creditors (Abebe, 2012). Therefore, from the point of view of attention, environmental uncertainty can increase the possibility of strategic imitation (Oh & Barker, 2015).

In this sense, the ABV explains that investments in any domain consume significant managerial resources that make it challenging to meet other organizational choices. For example, it is possible to analyze the sources of past successes, which generated superior economic performance and will continue to be the focus of management. Given historically defined positive outcomes, decision-makers will have limited cognitive and material capacity to address ecological or social concerns (Mithani, 2017).

In addition to explaining the investments, the ABV highlights the potential bias created by existing organizational structures and perceptions of the context in which companies are located in relation to how they perceive and interpret events (Pinkse & Gasbarro, 2019). It is justified because, for ABV, attention does not only refer to attention in terms of knowing whether the stimuli are noticed, but also to how the stimuli are interpreted, since the

interpretation of stimuli greatly influences the amount of attention dedicated to them (Cho & Hambrick, 2006; Pinkse & Gasbarro, 2019).

Finally, considering the cognitive abilities, limited rationality, and selective attention of decision-makers, I can consider that the choices will be made taking into account the temporally closer benefits than those that occur later. As well as the principle of ABV's situated attention, the future is less important than the present (Von Briel, Davidsson & Recker, 2017).

Factor BC2. Organizational structures and attention

Organizational attention explains organizational behavior, considering that both depend on the structural characteristics of the organization and the influence of actors (Ocasio, 1997). In this factor, the focus is on the effects of attention structures and the allocation of attention on organizational outcomes, which are a combination of cognitive and structural processes that affect the quality of decisions that are made based on information distributed by the organizational structure (Palmié, Lingens & Gassmann, 2015; Ferreira, 2017).

Attention structures are considered economical, social, and cultural that direct the focus of attention of decision-makers and can affect organizational attention and organizational results. Thus, organizational performance results from the various effects and specific contingencies of attention structures in the organizational attention process (Ferreira, 2017; Ocasio, 1997). The patterns of cognition and attention distributed within an organization are part of the organization's cognitive structure (Hutchins, 1995) and can operate independently of the organizational structure (Wilson and Joseph, 2015). Stimuli that arouse more emotion tend to capture attention more than relatively neutral stimuli (Zappalà, Antfolk, Dombert, Mokros & Santtila, 2015). The auditory attention process involves mediating the inhibition of irrelevant information rather than focusing on relevant information (Coenen, 2012).

The actions of decision-makers depend on which issues they focus their attention on, and for that, the context or particular situations can shape and direct this allocation of attention (Ocasio, 1997). The ownership structure of a private company is a contextual factor that influences the decision makers' attention to the activities. But the concentration of ownership reduces attention to monitoring, unlike when governance members are hired (Deman, Jorissen & Laveren, 2016).

Deman, Jorissen & Laveren (2016) argue that the decision maker's ownership level is a situational factor that can reduce attention, since ownership can be considered a proxy for the alignment of personal interests. A decision-maker will be fine if the company's performance is favorable. According to the authors, decision-makers selectively devote attention to important issues according to the ABV, depending on situational and structural factors (Ocasio 1997; Simon 1947).

The contingent aspect of organizational attention also mediates the relationship between attention structures and financial performance, as it is a multi-level process influenced by individual, organizational and environmental factors. For this reason, it is possible to state that the ABV is broad enough to cover the effects of decision-makers on organizational attention (Ferreira, 2017). As an example, it is possible to cite the study by Wilson and Joseph (2015), the authors claim that the attention given to problems within and between units of an organization affects their ability to engage in distant and local research, modeling how the problems are perceived and addressed.

Thus, the relationship between attention and knowledge can be considered because attention to certain problems will illuminate the interpretation of a given problem and expand the knowledge used to develop solutions (Wilson and Joseph, 2015). It will only be possible if the organization provides an environment where decision-makers are exposed to a large amount of information transmitted by signals. However, with limited attention due to time and processing power constraints, they selectively respond to a restricted number of stimuli from the environment (Bianchi, Murtinu & Scalera, 2019).

The allocation of attention within organizations shapes adaptation in the form of behaviors. Strategic adaptations, at times, are constrained by cognition, as decision makers' mental models are subject to situations such as routines. Thus, organizations can arrive at broader solutions through multiple paths, extending to the organization's cognitive structure. Both attentional mechanisms can operate simultaneously in an organization to generate performance benefits (Wilson and Joseph, 2015).

The organization's cognitive structure will provide the necessary assistance if critical external events arise that have a fundamental impact on the strength and duration of the decision makers' attention given that the attention-based dynamic tends to unfold as the uncertainty rate increases. This improves strategic decision making (Sebrek, 2014).

Few studies show how companies structure decisions from an organizational point of view and how attention is distributed throughout the decision process to identify, process, and transfer information between the organizational units involved (Palmié, Lingens & Gassmann, 2015). What is known is that it is impractical to monitor or pay attention to the entire company. As a result, organizations fail to detect threats and avoid calamities, not because of lack of signals or insufficient knowledge, but limited processing (Ocasio, 1997; Ocasio, Laamanen & Vaara, 2018). In addition, misalignment between decision-makers and a threat can also cause attention gaps (Downing, Kang & Markman, 2019). Awareness is an opportunity, as it precedes motivation and ability to act and guides companies' attention and information-gathering efforts before rivalry occur (Chen, Su & Tsai, 2007; Downing, Kang & Markman, 2019).

Factor BC3. Information processing systems, emotions and cognitive structures

Capturing and retaining management attention is important, but it is a challenge in organizations, as any strategic choice is influenced by contextual factors in the environment and structural controls that focus attention on decision making (Ocasio 1997; Galbreath, 2011). In contexts of discontinuous technological changes, also called radical innovations or disruptive innovations (Maula, Keil & Zahra, 2013), or in periods of strategic changes and adaptations, the processes of allocation of senior management attention are central to shaping the effective response of a company to new paradigms, since the allocation of attention is a prerequisite for an effective organizational response. However, executives may fail to pay attention to these changes because of their information processing systems, emotions, and cognitive structures (Graebner, Heimeriks, Huy & Vaara, 2017).

Organizations' attention structures are crucial for organizational adaptations, as change processes involve significant emotional work and goals that require a differentiated emotional capacity (Vuori & Huy, 2015; Maula, Keil & Zahra, 2013). Emotions are experienced, not acquired, and are triggered by personal circumstances that can be negative (Graebner, Heimeriks, Huy & Vaara, 2017). They must be considered from the perspective of subgroups within an organization where the object of attention usually varies. An example presented by Vuori and Huy (2015) refers to senior managers who focused attention on external threats from competitors, while middle managers focused on internal threats to their own careers.

Considering that emotional states are repeated over time, it is possible to say that they are likely to have a systematic effect on the success of strategic change (Vuori & Huy, 2016). In a longitudinal study, Vuori and Huy (2016) analyzed how Nokia lost the smartphone battle. They argued that part of the reason was increasing time pressure from mid-level managers for high performance, increasingly tight deadlines, shared fears of superiors' sanctions, along with lows the fear of outside competitors due to competitive secrecy, led them to act in a way that harmed the company's work rather than lead to productive strategic changes. The shared emotions of mid-level managers during the smartphone innovation process influenced the company's ability to respond to the market. Considering the types of emotions associated with different temporal markers, how they evolve over time, and how specific changes affect the agents' actions are relevant to address strategic changes and adaptations (Vuori & Huy, 2016).

Cognition is intertwined with emotion, both individual and organizational levels (Vuori & Huy, 2016). Therefore, emotions direct people's attention to the specific event that triggers the emotion and facilitate actions that address that specific triggering event. As an example in the case of mergers and acquisitions, which to describe it, it is necessary to focus more on the emotional work processes of key managers, how they manage their own emotions. Different behaviors are also differentially affected by this integration process. Identifying these behavioral changes can help mitigate disruptions and create synergies in the integration context (Graebner, Heimeriks, Huy & Vaara, 2017).

When approaching organizational adaptation emphasizing the interactive character of attention, Maula, Keil, and Zahra (2013) considered creating meaning and adaptation processes through which individuals bring new knowledge from their connections. Thus, decision makers' attention to allocation processes becomes critical to shaping strategic actions. In the case of mergers and acquisitions, when they happen, they require a long term so that vertical integration can internally cultivate the affective tone necessary to move forward or backward in the value chain (Graebner, Heimeriks, Huy & Vaara, 2017).

Integration includes converging processes and causes disruptions when different worlds collide, and substantive incompatibilities evolve. The primary source of tension is a clash of cultures, and few credible explanations for organizations' poor performance have been identified despite decades of research into the strategies and characteristics of companies involved in mergers and acquisitions and the transactions and financial details. What is known

is that both positive and negative emotions must be considered in the analyses, as negative emotions can also trigger positive results (Graebner, Heimeriks, Huy & Vaara, 2017).

Another important factor to be considered when observing information processing systems, emotions and cognitive structures of decision makers is related to environmental stimuli, such as the rules, resources and social relations of the company that regulate and control the distribution and allocation of questions, answers, however, what is known is that there are serious restrictions in the levels of attention. While some evidence suggests that organizations' decision-makers are paying attention to climate change, the only objective is to ensure that shareholder returns are maximized. The focus of attention is on financial performance, not climate change (Galbreath, 2011).

2.4.2 Cocitation analysis

The data obtained from the cocitation analysis can change over time as a field evolves. It allows checking how often two articles are cited together, measuring the degree of connection between them (McCain, 1990). This analysis can indicate research groups that share common theoretical and methodological themes (Small & Garfield, 1985), being useful to detect paradigm shifts and schools of thought (Zupic, & Čater, 2015). It also reflects the past influence and impact of publications.

To determine the analysis factors I used the EFA, which is an indicator of the degree to which an article belongs to the factor and the factor represents the subfield or theme (Nerur, Rasheed & Natarajan, 2008), with the closest articles tending to have higher loads on the same factor. The reduction of dimensions united 62 articles that belong to the references of the 45 articles that belong to the EFA of the coupling, which are presented in Table 6.

Table 6

Cocitation factor analysis

Exploratory factor analysis					
	Factor			**Comunalities**	**Cronbach**
	Factor CC1	Factor CC2	Factor CC3	h2	α
Coc5. Barr (1998).	.885	.102	.006	.793	,969
Coc52. Levinthal and Rerup (2006)	.835	.348	-.052	.822	
Coc71. Rerup (2009)	.833	.356	.035	.822	
Coc74. Salvato (2009)	.823	.375	-.139	.838	
Coc91. Weick and Sutcliffe (2006)	.804	.368	.000	.782	

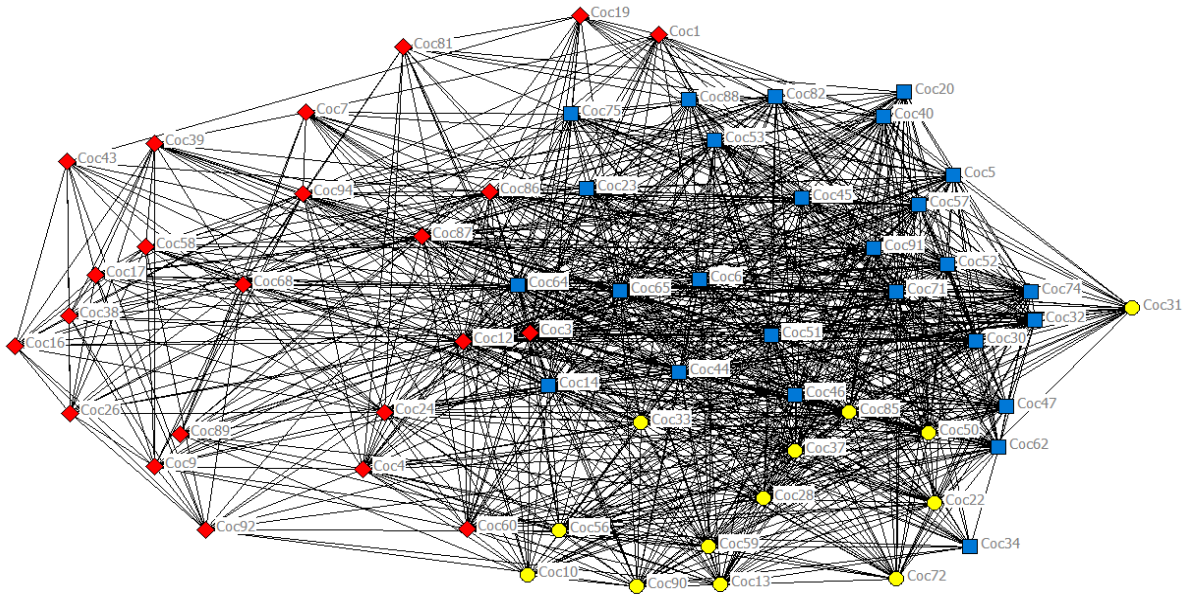
Coc47. Kaplan (2011)	.789	.394	-.002	.778	
Coc32. Grant (1996)	.785	.407	.005	.782	
Coc23. Eggers and Kaplan (2009)	.763	.193	.329	.727	
Coc30. Gilbert (2005)	.756	.315	.004	.671	
Coc75. Sharma (2000)	.743	.039	.324	.659	
Coc51. Levinthal and March (1993)	.736	.501	-.055	.795	
Coc45. Kaplan and Tripsas (2008)	.728	.318	.028	.632	
Coc6. Bouquet and Birkinshaw (2008)	.716	.464	.215	.774	
Coc46. Kaplan (2008)	.715	.519	.003	.780	
Coc62. Nutt (1984)	.709	.482	.025	.735	
Coc64. Ocasio and Joseph (2005)	.703	.371	.363	.764	
Coc53. Li, Maggitti, Smith, Tesluk and Katila (2013)	.701	.059	.277	.571	
Coc82. Thomas and McDaniel (1990)	.679	.053	.294	.550	
Coc44. Joseph and Ocasio (2012)	.671	.537	.110	.751	
Coc57. Maula, Keil and Zahra (2013)	.663	.337	.057	.556	
Coc65. Ocasio (2011)	.650	.418	.330	.705	
Coc88. Vissa, Greve and Chen (2010)	.609	.247	.146	.453	
Coc40. Hoffman and Ocasio (2001)	.595	.282	.249	.495	
Coc14. Cyert and March, J. G. (1963)	.556	.442	.447	.704	
Coc20. Dushnitsky and Lenox (2005)	.509	.363	.183	.424	
Coc34. Hansen and Haas (2001)	.400	.376	.398	.460	
Coc56. March (1991)	.148	.845	-.020	.736	
Coc13. Cohen, March and Olsen (1972)	.211	.829	.030	.733	
Coc90. Weick (1979)	.037	.826	.113	.696	,938
Coc37. Henderson and Clark (1990)	.377	.778	-.021	.749	
Coc28. Gavetti and Levinthal (2000)	.411	.724	.056	.696	
Coc72. Rosenkopf and Nerkar (2001)	.422	.714	.003	.688	
Coc50. Leonard-Barton (1992)	.537	.704	-.090	.792	
Coc59. Mintzberg, Raisinghani and Theoret (1976)	.385	.638	.188	.590	
Coc85. Tripsas and Gavetti (2000)	.597	.630	-.041	.754	
Coc22. Dutton and Ashford (1993)	.470	.603	.204	.625	
Coc31. Gioia, Corley and Hamilton (2012)	.383	.541	.213	.485	
Coc33. Hambrick and Mason (1984)	.473	.539	.259	.581	
Coc10. Chatterjee and Hambrick (2007)	.252	.522	.347	.457	
Coc68. Podsakoff, MacKenzie, Lee and Podsakoff (2003)	.192	.079	.846	.758	
Coc38. Hillman and Dalziel (2003)	-.094	-.078	.825	.696	,894
Coc58. Minichilli, Zattoni, Nielsen and Huse (2011)	-.053	-.033	.814	.666	
Coc16. Daily, Dalton and Cannella (2003)	-.139	-.107	.806	.681	
Coc26. Forbes and Milliken (1999)	-.164	-.048	.806	.679	
Coc17. Garg, Walters and Priem (2003)	-.064	-.041	.805	.653	
Coc43. Jensen and Meckling (1976)	-.095	.030	.792	.637	
Coc9. Carpenter and Westphal (2001)	-.061	-.020	.781	.614	

Coc39. Hillman, Withers and Collins (2009)	.190	-.110	.736	.591
Coc94. Yu, Engleman and Van de Ven (2005)	.298	.116	.712	.609
Coc87. Tuggle, Schnatterly and Johnson (2010)	.487	.067	.669	.689
Coc81. Teece, Pisano and Shuen (1997)	.229	.228	.624	.494
Coc86. Tuggle, Sirmon, Reutzel and Bierman (2010)	.486	.046	.611	.612
Coc3. Barnett (2008)	.549	.312	.589	.746
Coc12. Cho and Hambrick (2006)	.501	.327	.571	.684
Coc92. Westphal and Zajac (1995)	-.393	.349	.535	.563
Coc7. Bouquet, Morrison and Birkinshaw (2009)	.447	.116	.531	.495
Coc89. Vuori and Huy (2015)	.255	.279	.528	.422
Coc24. Eisenhardt (1989)	-.174	.517	.527	.576
Coc60. Nadkarni and Barr (2008)	.331	.258	.526	.452
Coc19. Driscoll and Starik (2004)	.407	.129	.507	.439
Coc1. Bansal (2003)	.493	.146	.498	.512
Coc4. Barney (1991)	.170	.410	.453	.403

Figure 4 presents the cocitation network. I used the final solution sample of 62 articles (specified in the data collection section and Table 2). The “knots” represent the sample items. Lines represent shared references. The thicker the line between two articles, the more references they share.

Figure 4

Cocitation Network



Nota: Fator 1; Fator 2; Fator 3.

Three main groups were formed, considering the overlap with the EFA factors (Table 2). We identified that the central article of the network is by Ocasio (2011), Coc65, followed by Cyert and March, JG (1963), Coc14, Cho and Hambrick (2006), Coc12 and Barnett (2008), Coc3. Network metrics are shown in Table 7.

Table 7

Cocitation network metrics

	Network metrics		
	Factor CC1	**Factor CC2**	**Factor CC3**
Cohesion	1.353	1.085	.686
Density	.850	.793	.575
Centrality	**Coc65**, Coc14, Coc12 e Coc3		

The factors identified in the AFE were named as follows:

CC1. Individual and organizational attention: a relationship with managerial cognition, capabilities and routines.

CC2. Cognitive processes, skills, abilities and learning.

CC3. Top management teams and the decision-making process.

Factor CC1. Individual and organizational attention: a relationship with managerial cognition, capabilities and routines

Research on attention in the field of Applied Social Sciences focused on directly or indirectly explaining organizational adaptation and structural determinism, both in the external environment, by institutional and ecological pressures, or about the market structure, and at the level of the company, analyzing the routines and capabilities for a rational strategic choice (Ocasio, 2011). In these contexts, attention at the individual level is understood as facilitating the ability of companies to overcome inertial properties and exercise managerial discretion over their environments (Hambrick & Finkelstein, 1995; Ocasio, 2011). On the other hand, organizational attention is not just a structural, monolithic phenomenon that can be stabilized and controlled by top executives, but it is a dispersed and evolving process (Rerup, 2009).

The notion of dynamic capabilities is consistent with the ABV, as dynamic resources are the company's capabilities to integrate, create and reconfigure internal and external competencies to deal with rapidly changing environments - are processses (Teece et al., 1997;

Eisenhardt & Martin, 2000; Ocasio & Joseph, 2005). These processes make it possible to pay attention to internal and external stimuli, which allows the organization to adapt its activities to the requirements of a changing environment. In addition, these processes enable attention to be directed so that people can come together, analyze problems and opportunities, and make critical decisions about initiatives that address organizational change (Ocasio & Joseph, 2005).

Even defining attention as an organization's process, we know that the interpretations decision-makers develop about the event itself, and the main dimensions of its strategy are a key component in the organization's strategic response to unknown environmental events. To understand attention at the individual level, it is also necessary to look at the underlying cognitive processes, attention, and the individual's level of interpretation related to strategic adaptation (Barr, 1998). These interpretations, in turn influence the actions an organization takes and the environmental strategy it chooses (Sharma, 2000).

When analyzing attention in a strategic decision-making process, it becomes coherent to understand that this process is a set of tightly coupled networks of operational and governance channels (Ocasio, 1997; Ocasio & Joseph, 2005). It happens in a fluid and distributed way in the organizational environment acting at the individual level. In this process, attention is guided by distributed processes and decision-making channels through which information flows and through which people dialogue. Through these channels, organizational leaders communicate and make critical and discreet decisions that involve organizational resources. Therefore, strategy formulation emerges from the organizational attention pattern incorporated in the interaction network of concrete operational and governance channels, both at the corporate level and the business unit (Ocasio & Joseph, 2005).

Interactions within and across governance channels at various levels provide a platform for attentional integration through which different perceptions can be resolved, and adaptive behavior can be realized. In other words, organizational architecture will be reflected in adaptive behavior. It structurally distributes attention across the company and organizational levels, focusing attention on different aspects of the organization's agenda. This distribution occurs because attention is placed within the company's governance channels. Thus, the joint situated attention, created in the governance channels, generates the necessary decision-making patterns to identify opportunities and respond to competitive threats in a coordinated manner (Joseph & Ocasio, 2012).

When addressing individuals' cognitive processes and organizations' strategies, it is impossible to advocate using a single construct or method to address these issues. In addition, methods developed in cognitive psychology, both behavioral experiments and state-of-the-art neuroscientific brain-scanning techniques such as (fMRI), can bring new insights to the field (Kaplan, 2011). Attention intensity captures the extent to which individuals allocate cognitive capacity to the attention process and, therefore, is related to effort in relation to other activities and persistence allocated to the attentional process (Ocasio, 2011; Li, Maggitti, Smith , Tesluk & Katila, 2013).

In organizations, routines can be understood as having cognitive and motivational dimensions that embody an understanding of how things should be done, and what is rewarded. As a result, these routines and economic forces can reinforce the "attention traps that cause managers to fail to see change. Ocasio (1997), when describing ABV of the company, argued that a set of contextual factors shape the allocation of attention in the organization, and he called this the rules of the game, the routines and incentive systems that structure the process by which interpretations are made. These various workflows imply that cognition, capabilities, and incentives are interconnected factors that shape organizational outcomes (Kaplan, 2011). An example that can be related to this statement is about the notion of absorptive capacity, which is the inclination of a company to seek knowledge that resides outside its limits, which increases in the presence of strong internal research capabilities, as a result of incentives made and developed cognitive processes (Dushnitsky & Lenox, 2005).

Managerial cognition is important in understanding organizational outcomes and, considering the direction of cognition and its interaction with organizational factors provides a more nuanced view of behavior. It can be considered a dynamic management capacity that can shape the adaptation of established companies (Eggers & Kaplan, 2009). In studies that address managerial cognition, organizations are understood as interpretive systems that perceive, interpret, decide and act in response to the environment (Ocasio, 1997; Kaplan & Tripsas, 2008). Organizations are situated in a strategic context where political processes or decision-making processes generate ascending or "autonomous" behaviors that obtain, in a rationalized and translated way, changes in strategies that can be both measurable and significant for the practice of managers (Bouquet & Birkinshaw, 2008). Both the strategy and the information processing structure are related to how decision-makers label strategic situations and the range of variables they use during interpretation (Thomas & McDaniel, 1990). Considering that in

addition to the diversity of information sources, the status of an information source also plays an important role because knowledge and information from these sources carry different weights for decision-makers (Maula, Keil & Zahra, 2013).

To analyze managerial cognition, it is necessary to look together at the organizational capabilities and incentives, which are separately important in the formation of results and their alignment towards adopting a new strategy that leads to the highest levels of change. Cognition can compensate when factors at the organization level are lacking (Kaplan, 2008). It is justified because managers do not use the normative methods prescribed by scholars for sound decision-making. Most decision-making processes are solution-centric, even if a problem has multiple stimuli that require immediate attention (Nutt, 1984).

In the decision-making process, several factors must be considered, and attention must be used to interpret the context to identify what constitutes an appropriate action in a given circumstance. Therefore, the interpretation of results forms the basis of learning processes, which have high cognitive demands (Levinthal & Rerup, 2006), unlike the stable action of a routine that has reduced cognitive demands, as routinized behaviors are based on absence or in the reduction of active thinking (Cohen, Burkhart, Dosi, Egidi, Marengo, Warglien & Winter, 1996). Therefore, in an organization with many routines, there is an absence and demand for little attention, as a pattern of action is preserved (Levinthal & Rerup, 2006).

Learning from something that went wrong in the organization means developing different organizational projects from what is routinely carried out to prevent the crisis from happening again. In this context, it is suggested by Rerup (2009) that attentional triangulation be put into practice. It refers to the intersection of three interdependent dimensions of organizational attention: stability, liveliness, and coherence to identify issues with the potential to have critical consequences for the organization. This triangulation provides an effective learning base to help organizations proactively respond to subtle cues (Rerup, 2009).

Thus, learning generates knowledge, which resides in the individual. The organization's main role is knowledge application rather than creation, acting as an integrator to be useful for capabilities (Grant, 1996). For the author, organizational capabilities as a result of the integration of knowledge from complex productive activities and teamwork.

Concerning the routines, individual daily interventions should be monitored and carried out to provide a realistic description of how resources evolve and support organizational change and performance. For this to happen, it is necessary to encourage and motivate all units, sub-

units, external and internal collaborators to actively participate in experimenting with new solutions within the functioning of capabilities. These routine-oriented behaviors can result in organizational adaptations that will require understanding elements of individual attention to the emergence of adaptive capabilities (Levinthal & Rerup 2006, Weick & Sutcliffe 2006). Thus, the process will be conceived as involving the individuals' attention and their abilities to respond quickly to contextual signals (Salvato, 2009).

When people move away from routines, quality results are more affected than the quantity of attention. Routine elements support mindfulness in the form of a need to sustain the sensitivity of mindfulness of this process and to have rich routines available for recombination when people deal attentively with the unexpected. Elements of mindfulness underlie routines in the form of a need to code the context to see what is appropriate and code the results for learning purposes. Routines provide raw materials and continuity, mindfulness operationalizes logic and interprets outcomes (Levinthal & Rerup, 2006; Weick & Sutcliffe, 2006).

The notion of mindfulness is a new stream of organizational research alongside a body of work in the organizational literature that emphasizes the role of routine-oriented or less attentive behavior. For example, it is possible to address activities in organizations that follow routines, and the longer decision-makers are together, the fewer members will try new ways of doing things. With this, organizations or teams become less and less attentive unless problems or interruptions arise (Ancona, 1990).

However, the effectiveness of the mindfulness process is related to the available tools, where the quality of that set of tools is, in turn, determined by the richness of the set of well-rehearsed routines available for the construction of new recombinations. Each individual and organizational subunit cannot be aware of all problems, and therefore the depth and breadth of what they are aware of is likely to vary (Levinthal & March, 1993).

Responding to discontinuous changes requires more than just the commitment of resources. It is necessary that the underlying organizational routines that use those resources also adapt to these changes (Gilbert, 2005). Less conscious processes change when they are interrupted, which can lead to a shift from the automatic performance of routines to the conscious processing of information involved in acquiring a new routine (Cyert & March, 1963).

Depending on their organizational form, companies vary in their focus of attention when defining aspirations. Organizational form affects a company's responsiveness to performance feedback differently depending on the research domain. Vissa, Greve and Chen (2010).

Factor CC2. Cognitive processes, skills, abilities and learning

Organizational results, strategic choices, and performance levels are partially predicted by the characteristics of the managerial background and by the reflection of the values and cognitive bases of decision-makers (Hambrick & Mason, 1984). They act based on their interpretations of the world, representing their particular social reality, which is adopted as meaning. These adopted meanings are implicit guidelines that organize and shape interpretations of organizational events and phenomena (Weick, 1979).

Understanding the standards of attention within an organization, taking into account the particularities of each decision-maker is important. It is also considered that each individual in an organization has limited time to devote to the various things that require attention, and their values and cognitive bases will define that choice. Behavior variations in organizations are largely due to issues of who is paying attention and what that individual is paying attention to (Cohen, March & Olsen, 1972).

A decision-maker cannot examine all aspects of the organization and its environment. His field of attention is restricted, selectively perceiving only some of the phenomena, which imposes a strong limitation on eventual perceptions. Then, information selected for processing is interpreted through the cognitive basis and values to provide the basis for strategic choice (Hambrick & Mason, 1984).

In this context of limitations, a decision can be considered as a specific commitment to action, and the decision-making process is a set of actions and dynamic factors that start with the identification of a stimulus for action and end with the specific commitment to the action (Mintzberg, Raisinghani & Theoret, 1976). Decision-making can also be considered a process of solving problems, which are carried out and defined by choice selected as a function of dedicated attention. In some cases, standard management assumptions and procedures break down because everyone is paying attention to everything all the time (Cohen, March & Olsen, 1972).

The allocation of attention to an issue is indicated by various behaviors, whether it be naming, gathering relevant information, talking about the issue, or creating dedicated roles or task forces on the issue. The allocation of senior management decision-makers' attention to an issue is necessary for them to take substantive action. An organization's successful adaptation may depend, in part, on the organization's ability to discover, explore, and institutionalize a problem that allows individuals outside of senior management to be effectively involved in identifying, communicating, and understanding important issues (Dutton & Ashford, 1993).

Given the way knowledge tends to be organized within an organization, learning about change is unlikely to occur naturally. Understanding architectural changes and new interactions between components can therefore require explicit management and attention. But it may also be that learning requires a different type of organization and people with different skills (March, 1991; Henderson & Clark, 1990). Successful organizations shift their limited attention from learning a little about as many different designs as possible to learning a lot about dominant design (Henderson & Clark, 1990).

The notion of bounded rationality offers two different logics of choice and action that can be understood in the process of learning about change. One logic is stimulus-response learning retrospective and a prospective logic of consequences. Organizational behavior comprises both forms of intelligence, but some central phenomena are at the interface of these two logics and can only be explained by considering them together (Gavetti & Levinthal, 2000).

The decision-making process within organizations is rational, and the knowledge and information processing structure start to reflect the internal structure of the product or project being designed. Knowledge embedded in routines and channels becomes inert and difficult to change (Henderson & Clark, 1990). Changing a cognitive representation can act as a mode of adaptation, which results in the sequential allocation of attention to different facets of the environment. This shift in cognitive representation that results from efforts to construct meaning with respect to past experiences and plays an important role in seeding or restricting the learning process can be offset by the loss of tacit knowledge associated with prior cognition (Gavetti & Levinthal, 2000).

Therefore, it is possible to state that attention limits the interrelationships between four flows in the decision-making process: problems, solutions, participants, and opportunities for choice. These four flows require attention, and although they are not completely independent

of each other, each of the flows can be seen as independent and exogenous to the system (Cohen, March & Olsen, 1972).

Problems are of concern to people and must be considered both inside and outside the organization. They can arise about family issues, careers, group relationships within the organization, ideologies, and more. Someone develops the solution, and often in organizations, it is impossible to know in advance the question of solving an organizational problem before even knowing the answer. Participants who are part of this interrelationship are passengers in organizations. Each entry is considered an exit somewhere else. The distribution of entries depends on the attributes of choice left as well as the attributes of the new choice. Opportunities for choice are occasions that are expected in an organization to produce behavior that can be called a decision. Opportunities arise regularly, and any organization has ways of declaring an occasion for choice. For example, people are hired, promoted, or fired (Cohen, March & Olsen, 1972).

This loss of knowledge, resulting from the interrelationship of flows, is related to the main capabilities that are treated as groups of distinct technical systems, skills, and management systems rooted in values. These capabilities inhibit innovation, and it is up to decision-makers to understand the important role of emerging strategies, highlighting the need for change and leading the way (Leonard-Barton, 1992). Rosenkopf and Nerkar (2001) explored the role of organizational and technological boundary research and found that research processes that do not cross-organizational boundaries have lesser effects on subsequent technology evolution. The impact of research is greater when the research goes beyond organizational and technological boundaries.

Even considering the need for external analysis, the problems of the macro-environment are, ultimately, those that determine the organization's survival in the environment. For example, natural circumstances, availability of economic and other resources, political disturbances are beyond the group's ability to control but, to some extent, determine the organization's fate (Weick, 1979). The move to change is not necessarily a change in the external environment, but the potential for further improvement has become limited due to the current structure. In other words, the structure of an organization significantly influences the actors' perceptions about their problem space (Gavetti & Levinthal, 2000).

Some challenges of these changes are rooted in the decision-makers. The inflated self-vision and intense need for attention will affect how they identify and evaluate strategic

alternatives, taking into account what favors the purposes of the organizations and their people. These individuals have been called narcissistic CEOs. They tend to favor strategic dynamism and grandiosity instead of strategic incrementalism and stability. They offer extreme performance, whether profit or loss and fluctuating performance for their organizations (Chatterjee & Hambrick, 2007).

Senior management's time and attention in an organization are critical but limited resources. As a result, the organizational context makes some paths easier, accessible, and routinized (the bureaucratic context), and creates the background against which such activities are interpreted and evaluated by others (the normative and political contexts), providing decision-makers different resources and capabilities (Dutton & Ashford, 1993).

Therefore, decision-making processes are complex and dynamic (Mintzberg, Raisinghani & Theoret, 1976). Only by considering the role of cognition and its implications in terms of organizational learning dynamics can we obtain insights about changes in capabilities, learning processes, and, consequently, organizational routines. The challenge for decision-makers is related to the development of skills to distinguish between changes that only require the development of new capabilities from changes that also require the adoption of different strategic beliefs (Tripsas & Gavetti, 2000).

Factor CC3. Top management teams and decision-making processes

The emerging view of strategic decision-making attaches greater importance to top management teams (Eisenhardt, 1989). For strategies to be implemented, a combination of physical, human and organizational capital is needed, in addition to the talent of executives (Barney, 1991). They, however, can only act on the phenomena to which their attention is drawn (Hambrick, 1981). In the decision-making context, attention must be directed to the interactions of social, psychological, and sociopolitical processes, promoting an understanding of modern corporations' control (Westphal & Zajac, 1995).

In this factor, the context of top management teams was addressed. First, it becomes coherent to approach boards of directors that perform two important functions for organizations, monitoring management on behalf of shareholders and providing resources (Hillman & Dalziel, 2003). In addressing the board's monitoring function, Tuggle, Sirmon, Reutzel, and Bierman (2010) noted that board members do not maintain constant levels of attention to monitoring but

selectively allocate attention to their monitoring role. Board members have significant limitations in information processing (Simon, 1947; Ocasio, 1997). As a result, do not consistently monitor management to protect shareholder value, but their monitoring behaviors are influenced accordingly to contextual and structural factors (Tuggle, Sirmon, Reutzel & Bierman, 2010; Tuggle, Schnatterly & Johnson, 2010).

The provision of resources depends on the assets, capabilities, organizational processes, attributes, information, and knowledge controlled by the organization, allowing the conception and adoption of strategies that improve its efficiency and effectiveness in the market (Barney, 1991). Therefore, for companies to build, maintain and expand competitive advantages, processes, positioning and paths are needed. The combination of their managerial and organizational processes is supported and defined by the specific assets they hold and the available paths, conditioned by their history, generate routines, skills, and assets that are difficult to imitate or replicate (Teece, Pisano & Shuen, 1997).

Two theoretical paths were developed to analyze the behavior of these top management teams. Agency Theory states that the main board of directors activity is to monitor management on behalf of shareholders. Effective monitoring can improve company performance by reducing agency costs generated by contract agreements between owners and top management teams (Jensen & Meckling, 1976; Hillman & Dalziel, 2003). Board members are considered rational (Cyert & March, 1963). The second path is based on the Resource Dependence Theory, which is less explored. It is used to study the company's boards of directors and performance and how they reduce interdependence and environmental uncertainty whether by vertical mergers/integration, joint ventures and other inter-organizational relationships, action policies, and executive succession (Hillman & Dalziel, 2003; Hillman, Withers & Collins, 2009).

Understanding the nature of effective board of directors functioning is among the most important areas on the horizon of management research (Forbes & Milliken, 1999). At the micro-level of board effectiveness, Minichilli, Zattoni, Nielsen and Huse (2011) identified three processes as determinants, namely effort norms, cognitive conflicts, and the use of knowledge and skills as determinants of board control and consultative task performance. For the authors, board control is increasingly considered a primary measure of board effectiveness. However, when analyzing these teams, it is relevant to understand that board processes have a greater potential than demographic variables to explain the performance of board tasks. The performance of board tasks differs significantly between boards operating in different contexts

(Minichilli, Zattoni, Nielsen & Huse 2011). Contexts are environments with processes and content that deserve adequate management attention (Driscoll & Starik, 2004). Another factor to be noted regarding the effectiveness of the board, this one is related to its heterogeneity, which influences the discussion of business issues at meetings (Tuggle, Schnatterly & Johnson, 2010).

While in previous decades, boards of directors were characterized as essentially formal and passive institutions. Today they fulfill their functions with widely varying degrees of attention, analysis, and participation. They have their actions increasingly monitored closely by institutional investors and the media, which challenges them to explore available knowledge and skills and then apply them to their tasks. Board members are seen as managers of organizational resources that impact the entire society for better or worse (Forbes & Milliken, 1999).

The use of knowledge and skills is a board capacity. It represents the minimization of process losses and cross-training and collective learning among members (Hackman, 1987; Forbes & Milliken, 1999). This process is related to the behavioral dimension of social integration, which refers to a group's capacity for cooperation (Cohen & Bailey, 1997). It is also related to Weick and Roberts' (1993) concept of caring interrelationship, a complex and caring system of interaction held together by trust, where individual actions are subordinate and responsive to demands for joint action.

However, it is necessary to consider that if knowledge structures are well developed. They can impede the efficient processing of information outside the area of expertise (Carpenter & Westphal, 2001), as individuals with more concentrated exposure to a particular problem-solving approach, or strategy are less likely to notice or consider alternative approaches (Ocasio, 1997). In contrast, the socio-cognitive perspective indicates how experience on other boards can enhance or diminish the ability of board members to contribute to strategy by focusing their attention on relevant strategic issues (Carpenter & Westphal, 2001).

Developing socio-cognitive theories that address whether and when corporate leaders have the appropriate strategic knowledge will contribute to the corporate governance perspective. The behavioral processes of top management team members are important. Still, there is potential power in models that link the broader socio-structural context in which boards are embedded and the surrounding environmental conditions. Following different strategies and operating in unfamiliar business environments provides individuals with more knowledge and

insight into a wide range of potential strategic alternatives (Carpenter & Westphal, 2001). Alternative theories and models are needed to effectively discover the promise and potential of corporate governance (Daily, Dalton, & Cannella, 2003).

Following the analysis of senior management teams, it becomes important to verify the CEO's influence in the board of directors' selection process after analyzing the board of directors. When incumbent CEOs are more powerful than their boards of directors, new directors tend to be demographically similar to their CEO. That is, demographic similarity provides an important basis for coalition building. When boards are more powerful than their CEOs, new directors look like the existing board. Social, psychological, and sociopolitical factors drive existing CEOs and board members to favor new demographically similar directors, and the relative influence of CEOs and boards predicts which party is most likely to fulfill their preferences in the new director selection process (Westphal & Zajac, 1995).

Regarding the decision-making performance of CEOs, it is necessary that before taking effective measures to influence organizational processes and results, the levels of key variables inside and outside the organization and the causal relationships of these variables with each other and with the performance of the company must be analyzed (Priem & Harrison, 1994). This analysis will only happen when CEOs prioritize the external and internal areas that deserve their attention and then collect and interpret the most critical data. For the organization to adapt well when facing a certain level of dynamism, the proper verification of the external environment or the internal circumstances of the company alone would not lead to high performance. But this analysis is beyond the information-processing capability of any individual, so CEOs must prioritize how to deal with it. Thus, the cognitive limits of CEOs (Simon, 1957) force them to pay selective attention to key criteria in making strategic decisions. Therefore, the cognitive limits of CEOs require them to be selective in the control task. The greater use of information increases the sense of controllability and accuracy about the environment. The focus of information used should be mainly directed to areas considered important, given the competitive environment in which the company finds itself. Thus, attention will be diverted to variables not under direct control (Garg, Walters & Priem, 2003).

In addition to the contextual, structural, and economic factors that occupied a central place in the strategic management of organizations, the importance of emotions shared between various groups and their powerful impact on the competitiveness of companies must be considered when evaluating the decision-making performance of CEOs, as they are the ones

that influence distributed attention structures. These shared emotions can impede subsequent integration of attention, influencing innovation processes and outcomes and resulting in temporal myopia – a short-term focus (Vuori & Huy, 2015). Intense emotions such as frustration, distrust, and loyalty also shape organizational politics (Eisenhardt, Kahwajy & Bourgeois, 1988).

In the context of change and adaptation, managerial attention reflects both their deliberate intentions and their emerging behaviors (Yu, Engleman & Van de Ven, 2005). The reasoning for real intentions presupposes timely and effective management decision-making but does not address the ability of CEOs to deliver it. There are effects of a company's specific structures of concrete and contextual attention on how CEOs perceive, defend, acquire, maintain, exercise, and abandon the various real options in their portfolio. It will influence the business opportunities recognized and influence the degree to which decision-makers focus their attention on external or internal stimuli (Barnett, 2008).

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2.5 Intellectual Structure of Research Fronts in the ABV Field

In Figure 5 I present the intellectual structure of the research fronts in the field of ABV. This conceptual model was developed using the results of the bibliometric analysis and the interpretation of the data contained in Table 8. It resulted from the analysis of articles of the co-citation cited in the references of the bibliographic coupling sample. Therefore, considering the data from the AFE, the network parameters, and the entire bibliographic survey carried out, the studies are being carried out, taking into account the variety of mechanisms and levels of analysis.

The intellectual structure identified in this study starts from the decision-making process to analyze the cognitive processes, competences, capacity, and individual learning. These are all the mechanisms that form the research fronts of the cognitive capacities supported by specific neural networks. The decision-making process is also considered an intellectual structure and the capabilities and organizational routines that support research fronts related to organizational structures and information processing systems.

Table 8

Influence of Cocitation Factors Articles on Matching Factors

			Cocitation		
			Factor CC1	**Factor CC2**	**Factor CC3**
			26 articles	13 articles	23 articles
Bibliographic coupling	**Factor BC1**	32 articles	9.37%	5.76%	11.41%
	Factor BC2	9 articles	11.96%	14.52%	11.11%
	Factor BC3	4 articles	25%	21.15%	8.69%
	Total influence			10.71%	

Relating the findings to the three principles that Ocasio (1997) proposed the ABV, it is possible to state that when analyzing cognitive abilities and the decision process, we address the first principle. The Focus of Attention where managers are selective in their attention, that is, attention paid to issues that guides their decision-making processes. The Focus of Attention, or the selective attention of managers, is due to their limited cognitive abilities (Ocasio, 1997).

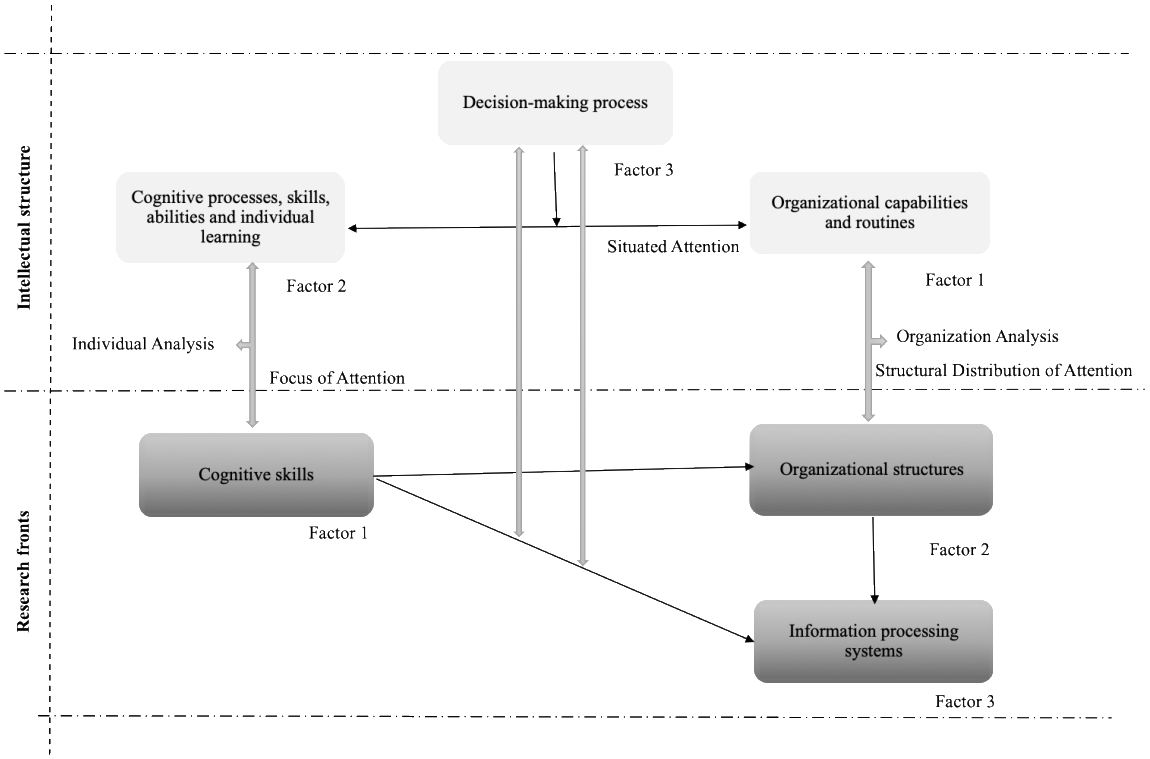
Organizational skills and routines refer to the fact that the focus of attention of individuals depends on specific contexts and information processing systems, emotions, and

cognitive structures that occur when the individual is experiencing the action. These factors are in line with Ocasio's (1997) second principle, Situated Attention. The focus of attention of decision-makers depends on the particular situation they are in, the situational context. Attention varies with context and can influence behavior. Situational contexts, in turn, are formed by the environmental stimuli received for decision making, by how questions and answers are incorporated with aspects of organizational identity, and by the procedural and communication channels established for interactions between the organization's members.

Organizational structures and attention focused on analyzing organizations and can be related to the third principle, the Structural Distribution of Attention. Ocasio (1997) stipulates that the structure and social relationships in organizations condition the situational context in which the manager finds himself and the attention that managers pay to the situations they find themselves. Decision-makers are involved with specific questions that demand different answers. These are influenced by the division of labor by functions in the organization, local procedures, and communication channels and activities. These questions and answers lead to variance in the focus of attention of managers and groups of managers in the company, depending on the functions to which they are allocated.

Figure 5

Intellectual structure of research fronts in the field of Attention-Based View



Decision-makers can focus attention based on their knowledge and experience or from something in the environment catching their attention. Organizations are places where data is available, but the challenge is interpreting data to understand what that data means to the organization. Because it is limited, attention is activated by signs that are significant for the organization. Still, it also requires the ability of managers to perceive all the environmental signs that may be strategically relevant. Attention limits ensure that certain types of data go completely unnoticed, preventing interpretation at all (Shepherd, Mcmullen & Ocasio, 2017).

Therefore, ABV demonstrates that the organization is seen as a set of attention failures considering decision-makers and other influential actors in the strategy, and the analysis of this process must be carried out both at an individual and organizational level. This is justified, as decisions and actions in organizations influenced by the focus and management attention (individual) are considered. Therefore, managers' attention will determine questions and answers that may help explain the behavior and adaptation or not of companies to the environment (Ocasio, 1997).

2.6 Discussion and Proposal for Directing Future Research in the Field of ABV

The literature on ABV noted the importance of structural determinants of organizational attention and is still in the early stages of validation. Resources, game rules, players, and social positions within the organization generate a set of values that order the legitimacy, importance, and relevance of questions and possible organizational responses for companies (Ocasio, 1997).

Researchers studying ABV are challenged to relate the structure within organizations and events outside their boundaries that can influence senior management's attention. In other words, research should be extended to include structures beyond the company's boundaries, as decision-makers in organizations are embedded in various inter-organizational structures that can influence their attention patterns (Maula, Keil & Zahra, 2013).

Another issue that should be considered in future research is the information available in electronic formats. It makes the attention that individuals can devote to searching, classifying, and interpreting available information (Hansen & Haas, 2001). As much as there is a wealth of information, there is a poverty of attention (Simon, 1947). Analyzing the dissemination of information in organizations is premised on the view that information is scarce and difficult to obtain. On the other hand, in information-rich contexts, where members of the organization are

likely to experience information overload, a very high proportion of readily available information to the information needed to complete a task and confront a lot of information that is irrelevant to their tasks but not have a sufficient amount.

The results of this bibliometric study highlight that theory can be a source of discoveries and provide a programmatic direction for the flow of future research (Table 9). It was possible to identify gaps in the literature and constructs that may be especially relevant for conducting empirical research.

Table 9

Proposal to guide future research in the field of ABV

Analysis of the individual in organizations	• Investigate how top-down and botton-up attentional processes are integrated into organizations. • Check how individual attributes and situational factors influence • Measure the level of board member involvement in monitoring and the quality of that monitoring with longitudinal data. • Analyze the relationship between attention and status (individual's position) in the organization. • Analyze how experience influences the formation of cognitive structures and how cognition affects the accumulation of experiential wisdom.
Decision-making process	• Understand what the relationship is between attentional stability (or vigilance) and executive attention and how they combine to achieve attentional involvement in the decision-making process. • Multilevel linking outcomes at decision, group, and individual levels of attention. • Analyze the phenomenon of decision making in different market contexts. • Understand how uncertainty affects managers' focus to demonstrate changes that can occur in managing work when managers notice a significant increase in uncertainty in the business environment. • Explore circumstances where company-level guidance and CEO attention differ from one another. • Assess the quality of the board's attention to monitoring.
Organizational structure	• Understand how the relationship between individual and organizational attention occurs. • Identify how context moderates attention allocation and corporate development. • Investigate how internal/structural and external/situational determinants interact to shape organizational attention. • Check how the interpretations and attention of the top management team are related to the formation of core competencies and competitive advantage. • Explore how organizations' communication channels can influence the direction of individuals' attention. • Understand the role and external structural determinants considered to be important factors in guiding organizational attention. • Understand the relationship between individual and organizational attention, especially the distribution of attention at the organizational level.

According to Ocasio (2011), the research challenge on ABV is that they are based on different metatheories and on different definitions and understanding of the construct of attention itself. However, research in cognitive neuroscience or research that uses

neuroscientific methods in organizational studies challenges this point of view. Neuroscientific tools enable problem analysis, conflict resolution, and decision making, which are essential for organizational effectiveness and involve alternating changes in attention (Ocasio, 2011).

Furthermore, research by cognitive neuroscientists has demonstrated that attention is not a unitary process but is best understood as a variety of interconnected processes that operate in the brain's environment, neural networks (Posner and Rothbart 2007). Understanding how cognitive, environmental, and intra-organizational forces shape organizational behavior and strategy is still a challenge. Still, neuroscientific methods hold promise that can help unveil how top-down and bottom-up attentional processes are integrated in organizations and the relationship between individual and organizational attention (Ocasio, 2011).

For them to observe and understand large areas and their processes, we need to develop a broader definition of attention related to management and decision-making processes. It is relevant to present how attention structures have developed over time and how they are inserted in organizations so that it is possible to observe the structural distribution of this attention.

To make this broader definition of attention in the field of management possible, it will be necessary to demonstrate it in its different perspectives, both social, cognitive, and neuroscientific. Greater attention to the interaction of social, psychological, and sociopolitical processes and between environment, cognition, and action, with a focus on other types of beliefs derived from other sources, can promote an understanding of the control of modern corporations.

2.7 Final considerations from Stydy I

Simon's (1947) initial view explains the company's behavior by how it channels and distributes attention to its decisions. Organizations make decisions taking into account the channeling and distribution of the attention of their decision-makers. Attention is understood as a process of taking possession by the mind, clearly and vividly, of one of those that seem to be several objects or lines of thought simultaneously possible, which will only be possible with focus and concentration. For that, it is necessary to make choices to dedicate oneself to just one situation. Decision-makers need to focus their energy, effort, and attention on a limited number of issues to achieve sustained strategic performance (Ocasio, 1997).

To understand why organizations do things the way they do and why they perform, we need to understand the minds of decision-makers, including their priorities and preferences,

their stores of knowledge and assumptions, their attention to and interpretation of new information, and even the dynamics between these individuals (Hambrick and Crossland, 2018). Thus, we justify our quest to understand and develop studies involving ABV and conclude that the intellectual structure identified in this study is part of the decision-making process to analyze the cognitive processes, skills, capacity, individual learning. I.e., all the mechanisms that form the research fronts of cognitive abilities that are supported by specific neural networks. The decision-making process is also considered as an intellectual structure together with the capabilities and organizational routines that support research fronts related to organizational structures and information processing systems.

Therefore, the ABV connects the stimuli received from the company's external and internal environment and the executives' repertoire of cognitive and cultural schemes to attention determines the responses to the challenges of their environment. Some questions remain insufficiently investigated in this area of research. I believe that neuroscientific tools can aid investigation and search for answers in this area.

One of the most significant barriers to the advancement of research is empirical dogmatism. In the field of applied social sciences, this reveals itself in relation to the neutral scientific methods that are being discovered. Researchers often adopt a research paradigm that fits a very narrow conceptualization of the whole topic, to the exclusion of alternative paradigms. They then become less inclined to embrace research that contradicts models and theories or research that is critical of previous research methodologies or findings. It will not help boost the field of governance (Daily, Dalton & Cannella, 2003).

Therefore, as a suggestion for future work, analyzing the criticism that strategy studies often do not test their constructs or unobservable mechanisms (Miller, 2010; Miller & Tsang, 2011), I suggest the use of experiments that can address the decision-making and the psychological and cognitive foundations of strategic practice, using these research fronts found and the principles defined by Ocasio (1997).

Some emotional, cognitive, and implicit factors shape behavior and decision-making in organizations. Attention is one of the main ones. Future studies can look at the structural distribution of attention using neuroscientific tools to advance the field.

3 Empirical studies

3.1 Introduction

Attention-Based View (ABV) studies (Ocasio, 1997; Ocasio & Joseph, 2005) have been increasingly used by researchers to explain organizations' strategic choices and behavior. In ABV, the organization is understood as a set of attention failures, considering decisiodecision-makersher influential actors in the strategy. ABV considers that decisions and actions that organizations are influenced by the focus and management attention. Managers' attention to certain questions and answers to these questions can help explain the behavior and adaptation or not of companies to the environment (Ocasio, 1997; 2011; Ocasio & Joseph, 2005; Joseph & Ocasio, 2012; Greer, Carr & Hipp, 2015; Palmié, Lingens & Gassmann, 2015; McCann & Bahl, 2016; Joseph & Wilson, 2018; Galbreath, 2018; Ma, Kor & Seidl, 2020).

Existing studies on ABV have investigated various aspects such as: the influence of the organizational environment on managerial attention (Cho & Hambrick, 2006; Abebe, 2012; Vuori & Huy, 2016; Joseph & Wilson, 2018); understanding the influence of the internal and external context on managerial attention (Yu, Engleman, & Van De Ven, 2005; Rerup, 2009; Sullivan, 2010; Bourmistrov & Kaarbøe, 2017); the importance of personal traits and cognitive aspects that affect the attention of individuals and groups in the organization (Bouquet, Morrison, & Birkinshaw, 2009; Souitaris & Maestro, 2010; Tuggle, Schnatterly, & Johnson, 2010; Oh & Barker, 2018); the relationship between managerial attention and strategic choices (Fernhaber & Li, 2013; Bahadir, DeKinder, & Kohli, 2014; Cavazos & Rutherford, 2017). Research on ABV is still considered fragmented and has gaps to be answered (Ocasio, 2011).

One of the principles of ABV is the Structural Distribution of Attention. In this principle, the structure and social relationships in organizations condition the situational context in which the manager finds himself and the attention managers pay to the situations in which they find themselves. Researchers have paid more attention to top executives (Ocasio & Joseph, 2005).

However, decision-makers are involved with specific questions that demand different answers. They are influenced by the division of labor by functions in the organization, local procedures, and communication channels and activities. These questions and answers lead to a variance in the focus of attention of managers and groups of managers in the company,

depending on the functions to which they are allocated (Ocasio, 1997). In particular, attention to the same issues varies in each organizational position (Rerup, 2009).

Despite the growth of research on organizational attention. still questions to be answered. Some theoretical issues have been identified but not empirically addressed, as well as controversies and theoretical and practical tensions in the literature on ABV and strategic organizations. These gaps allow the development of new research paths. There are a variety of dimensions and dynamics of managerial and organizational attention that influence the decision-making process. However, the influence of attention processes and results in organizations has not yet been identified, considering that managers coordinate their selective attention to avoid missing emerging opportunities and threats or how senior management teams keep their attention to peripheral topics.

To empirically understand these varieties and dimensions of managerial and organizational atention, it is necessary to develop and implement new methods to understand the processes presented and analyzed by the ABV. Theoretical development on ABV and organizational attention are extensive and greater than empirical research, leaving many theoretical questions empirically unresolved. Provides new ways to identify the causal effects of organizational attention on behavior, change and strategic results is a gap to be filled, which must consider how attention oscillates between different goals, understanding the differentiation and integration of attention to describe how it is sustained in organizations, sectors, structures and institutional fields.

In research that addresses behavioral strategy, there is a question about the influence of intermediary managers on the performance of organizations (Wangrow et al., 2015). This gap can be considered a multilevel problem, which Ocasio (1997) defines as a set of attentional failures. This can occur for many reasons, for example, when the manager intends to focus on the organization's performance, depending on other situations such as the communication channels or the movement of teams. Making the organization focus on performance depends not only on its perception but also on how everyone will act together regardless of function, position, or profile. Despite not being a multilevel study, we sought to assess the existence and possible impact of attentional failures resulting from the structural distribution of attention.

The focus of attention of decision-makers impacts strategic choices and results. This attention is contextually situated and socially structured. In this study, the objective was to evaluate the effect of the professional profile and the internship in allocating attention

(individual characteristics) of future managers of organizations. Formal education has been investigated in relation to performance for some time (Wiersema & Bantel, 1992; Rajagopalan & Deepak, 1996), but not it's direct influence as a starting point for managerial attention or attention in certain managerial functions that employ managers with particular training.

The shift from content to focus on the strategy process (Miller & Tsang, 2011) has required new methods for researching the area of strategy (Powell, Lovallo & Fox, 2011, Hambrick & Crossland, 2018). In particular, several studies use neuroscientific tools (Waldman, Balthazard & Peterson, 2011; Balthazard et al., 2012; Hannah et al., 2013). These tools have progressed with the promise of allowing larger sample sizes for their cost-effectiveness and portability (Ashkanasy, Becker & Waldman, 2014).

This part of the work is organized into five sections, starting from this introduction. Section 2 presents the theoretical background, including an explanation of neuroscientific tools, but with a focus on eye tracking and its application and a brief theoretical description of the concepts of attention-based view (ABV). In section three, there is a description of the methods used to collect and analyze data from studies 2 and 3. Section four presents the results, and, finally, the discussion and conclusions and references were exposed.

3.2 Study 2 – Attention from the Perspective of Future Professionals in Organizations

3.2.1 Study 2 Contextualization

The behavioral strategy seeks to understand the strategic decisions and behaviors of strategists supported by psychology. Seeks to understand why in organizations executives guide actions and how and why they perform. The focus of the behavioral strategy is to understand decision makers' minds, including their personal priorities and preferences, their stores of knowledge and assumptions, their attention to and interpretation of new information, and the dynamics between these individuals (Hambrick and Crossland, 2018).

Formulating strategies and putting them into practice is a differentiated human activity that can leverage human efforts and competencies, generating value for the company (Koellinger, 2008). However, when managers are inserted in organizations, it is impossible for them to focus on attention, situated attention, and structural distribution of attention due to limited rationality and other factors such as a focus on attention, situated attention, and structural distribution of attention.

In this context, analyzing the decision-making process with a focus on attention emerged the ABV presented by the conceptual article by Ocasio (1997). ABV has received a lot of attention, from the possibility of explaining organizational behavior providing gaps not explained by traditional economic approaches in the field of strategy. Driven by changes at the societal level, including but not limited to the proliferation of data, information, and algorithms, the practice of strategic organizations has changed significantly since the original publication by Ocasio (1997).

Information technology, the rise of social media, and data collection and monetization have exacerbated information overload problems, made the initial insights of ABV more relevant while changing the nature of how attention is structured (Haas, Criscuolo & George, 2014). These changes led to the development of greater cognitive demands imposed on members of the organization (Laureiro-Martinez, Brusoni, Canessa & Zollo, 2015).

The absence of methods and tools did not allow the assessment of attention from the individual's perspective. In this study, I propose to use a neuroscientific tool to analyze the allocation of attention. We intend to answer the following research question: Can the allocation of attention be affected by the professional profile and by the internship in future professionals in organizations? Data were collected with the support of an eye tracking software, Realeye.io, during the online experiment between researcher and research subjects. To define the professional profile, the research subjects answered a self-report questionnaire.

3.2.2 Conceptual model and Hipotheses

ABV is based on three basic principles that, together, argue that strategic behavior is the result of focusing and channeling attention (Table 10).

There are six elements that interact when analyzing the ABV: the decision environment, the repertoire of questions and answers, the procedural and communication channels, the company's attention structures, and the organizational movements and decision-makers. Attention structures are especially important for this article. They are divided into four types of structures that can guide decision makers' use of time, effort, and attention in assigning value to questions and answers and legitimizing procedural and attentional channels. These structures are: rules of the game, players, structural positions, and resources (Ocasio, 1997; 2011; Ocasio & Joseph, 2005; Joseph & Ocasio, 2012).

Table 10

ABV principles (Ocasio, 1997)

Principles	Description
Focus of Attencion	Managers are selective in attention due to their limited cognitive abilities. That is, attention given to issues guides their decision-making processes.
Situated Attention	In this principle, the focus of attention of decision-makers depends on the particular situation they are in, situational context. Attention varies with context and can influence behavior. Situational contexts, in turn, are formed by the environmental stimuli received for decision making, by how questions and answers are incorporated with aspects of organizational identity, and by the procedural and communication channels established for interactions between the organization's members.
Structural Distribution of Attention	The structure and social relationships in organizations condition the situational context in which the manager finds himself and the attention managers pay to the situations in which they find themselves. Decision-makers are involved with specific questions that demand different answers, which are influenced by the division of labor by functions in the organization, by local procedures, and by communication channels and activities. These questions and answers lead to a variance in the focus of attention of managers and groups of managers in the company, depending on the functions to which they are allocated.

Ocasio (1997) defines attention structures as the social, economic, and cultural structures that govern the allocation of time, effort, and focus of attention of decision-makers in organizations. Therefore, rather than channeling the flow of attention, attentional structures are the contextual factors that influence how the decision was made to prioritize activities and identify possible problems that vie for attention. Furthermore, they provide the context that guides the creation of concrete procedural and communication channels. As a company's attention structures vary, its decision-makers will attend to different aspects of the environment (Barnett, 2008).

The structural positions, which are the focus of this study, are related to the different responsibilities of individuals, corresponding to the division of work in the various functions and places they occupy in the organization's hierarchy. These structural positions define the company's internal or external relationships. As a result, the focus of their attention is directed towards a particular set of questions and answers.

The position, function, or the professional profile of individuals can define the structural positions, which their training will not necessarily guide. The structural position ends up influencing and makes the person, due to the function/position/profile they exercise and not due to their academic background, have specific attention, not necessarily the same as that of another professional profile. These patterns of attention can affect the organization's

performance differently (Abebe, 2012) and the choice of organizational strategy and the boundary conditions of such relationships (Chen, Zhang & Jia, 2019).

H1: The professional profile of individuals influences the choice of information (AOI) for the allocation of attention.

To develop the ABV, Ocasio (1997), was influenced by the limited rationality presented by Simon (1947). Simon's (1947) perspective in relation to attention is that it exists rationally limited, therefore, dependent on the roles and responsibilities of managers in the organization's structure. These roles and responsibilities of managers make them pay attention to different stimuli or consider the contexts in the situations they experience differently. Therefore, future professionals are constrained by the company's attention structures (Ren & Guo, 2011), increasing the need to understand the impact of managerial discretion at these levels (Wangrow, Schepker & Barker, 2015; Sierra, Serra, Guerrazzi & Teixeira, 2019). The studies analyzed do not consider the possibility of attention failures from individual characteristics of these intermediary managers, such as training, profile, and function performed, especially when technically specific, such as accountants in an accounting sector.

Depending on their professional profile and orientation, individuals have a predisposition to decision-making influenced by the allocation of attention made available to information. When the individual knows the theory and only the guidelines of how tasks, processes, or activities are carried out, he has an impression of the whole. When this individual is inserted in these tasks, processes or activities, practicing what he has learned, will be able to absorb and interpret information differently. The organizational environment and the structural distribution of attention provide him different lenses to analyze the available information. As a result, from an attention-based perspective, organizational attention and firm behavior depend on the structural characteristics of the organization. Furthermore, this structural perspective of organizational behavior highlights the influence of actors in organizational attention (Ferreira, 2017).

When entering organizations and being part of areas or functions, individuals receive distributed information that is more relevant to their day-to-day activities and decision-making in that location. It means that their professional profile, regardless of their initial training, is aimed at understanding and interpreting information from that area, that function. Therefore

they will allocate their attention in one place or another. That's why the structural position of an individual ends up influencing their professional profile. For example, individuals in the commercial area are focused on maximizing sales by addressing customer demands, unlike people in the production area who want to maximize efficiency.

On the other hand, individuals in a technical role are more dependent on routines and tend to focus on those routines and decisions based on those routines. Position in the structure or function exercised tends to affect the allocation of professionals' attention significantly. A company's attention structures affect how individuals at various levels serve the developing portfolio of opportunities to create and destroy value created (Barnett, 2008).

H2: In the organizational environment (internship), the structural distribution of attention influences the choice of information (AOI).

Bounded rationality leads to the creation of organizational structures and processes that shape and are shaped by limitations of human cognitive processes. In the context where functions, profile, and areas are related, attention is significantly driven, but not limited, by the aspects on which the managers of these environments focus their attention, and this attention is inherently situated in a social context and distributed throughout the organization (Ocasio, 1997; Koryak, 2018).

3.2.3 Eye tracking Method

This section presents the steps and methods used to develop and apply the research. Initially, we present the definition of research instruments and image stimuli. After these definitions, statements for self-report were elaborated and validated by the judges. Then we performed the pre-tests of the research instrument. Information on the application of the eye tracking tool, sociodemographic information on the sample, and the procedures for analyzing the results are also described in this section.

3.2.3.1 Definition of Research Instruments

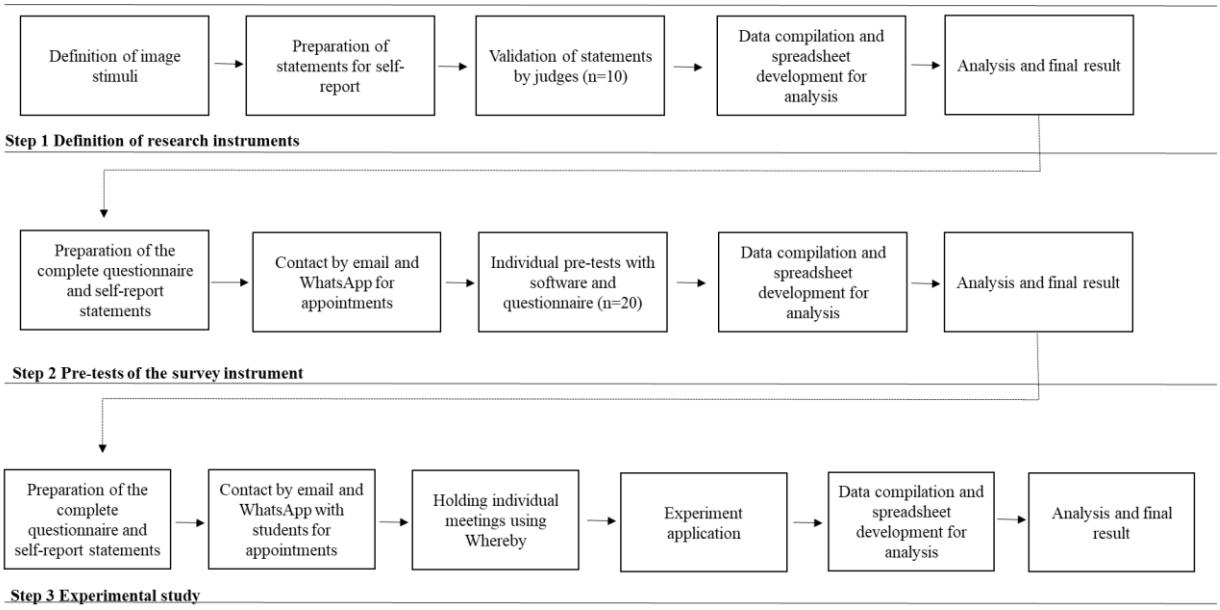
In this study, I researched a causal experimental type research carried out in a real environment, also called field, to verify the existence of the cause and effect relationship

between the studied variables, using theoretical support for the supposed relationship under analysis. The experimental design was between-subjects. Each one was exposed to only one of the two possible situations (da Costa Hernandez, Basso & Brandão, 2014). For that, the quantitative approach was used.

The experiment was carried out in three complementary steps, as shown in the research steps framework (Figure 6). Each step is discussed in detail in the following subsections.

Figure 6

Research steps



3.2.3.2 Definition of Image Stimuli

To make decisions in organizations, managers consider the information they deem relevant. However, processing this information and the attention provided is a demanding exercise, and some individuals have limited abilities to deal with this (Hillenbrand & Schmelzer, 2017). Loewenstein, Sunstein and Golman (2014) highlight that psychological factors such as limited attention can severely undermine the effectiveness of decisions.

In this study I developed an image that has four quadrants (Figure 7, 8). Two of them have strategic information aimed at content that is part of the training of students in the Administration course. The other two quadrants have financial information that is part of the training of students in the Accounting course. The students were divided into two groups and

each group viewed one of the images, they have the same information, but they are mirrored to avoid bias, preferring to observe one side or the other.

Previous studies have shown that visual information can present visual disturbances (Hillenbrand & Schmelzer, 2017), for example, through the use of colors or logos. Therefore, considering the image used, to ensure scientific validity, the image's background was white. The information is written in black with a constant font size of size 14. The graphic elements have shades of gray to avoid the influence of colors in judgment and decision-making.

In study 2, the choice of Accounting Science students is justified because there is no overlap between the mandatory subjects about the Business Administration course at federal universities. In study 3, the sample consisted of managers from strategic areas and managers from Accounting related areas.

Figure 7

Image format 1

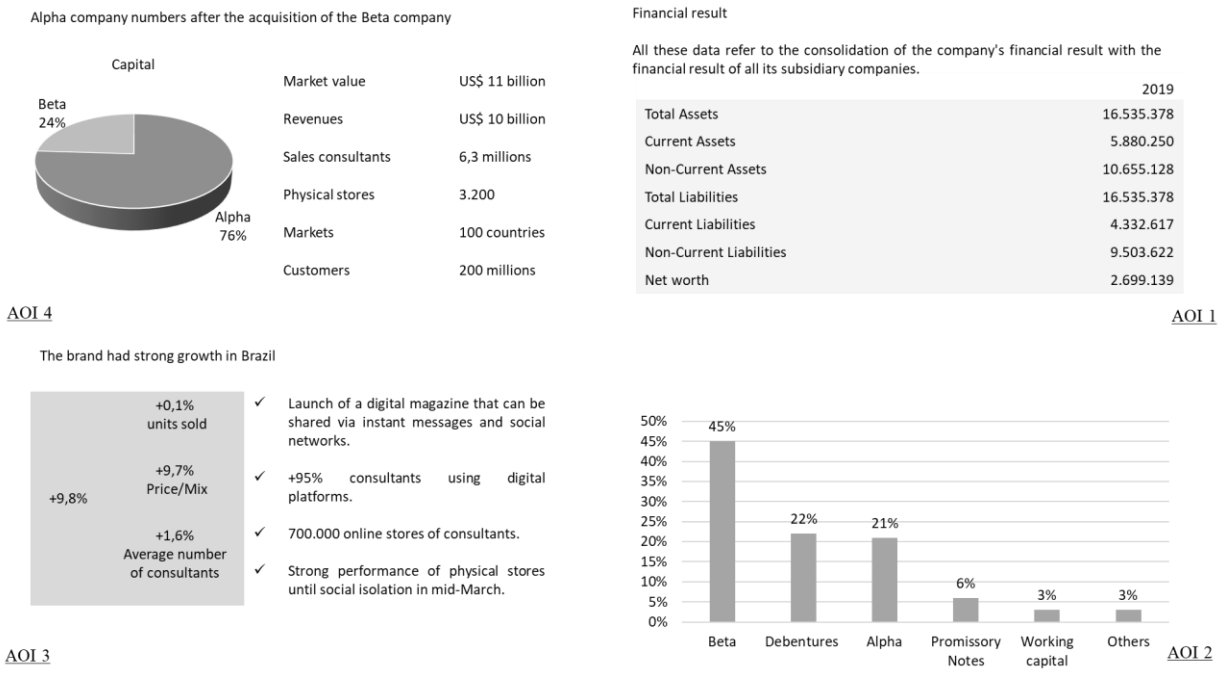
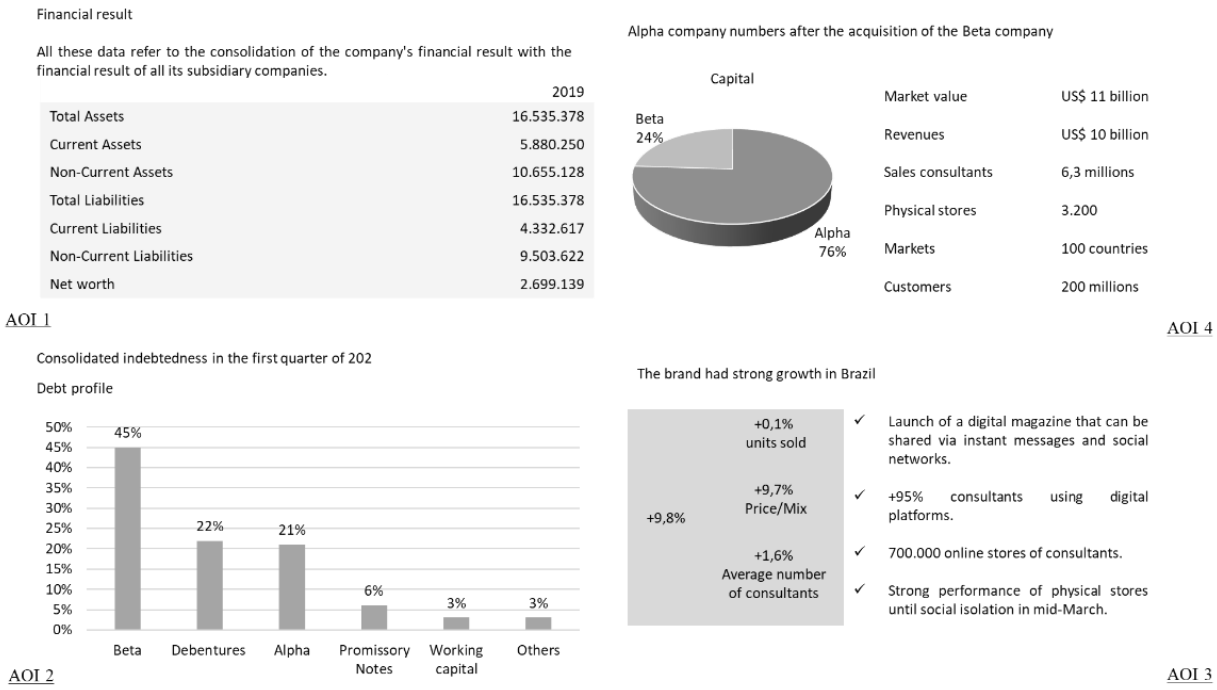


Figure 8

Image format 2



In Table 11, I present a brief comparison of the courses in relation to workload, objective, skills and competencies, as well as the presentation of the subjects focusing on business strategy and the organization as a whole and focusing on financial analysis or calculations.

Table 11

Characterization of Administration and Accounting courses at federal universities

	Business Administration	**Accounting**
Workload	3,300 h	3,152 h
Course objective	Technical-scientific and human training in administration. Scientific training, understanding research as a driving force for teaching and learning. Professional education enabling to work in teams, in an inter-professional perspective.	Provide students with the basic training necessary to act as professionals with a technical, ethical, intellectual, and scientific profile desired by contemporary society with a critical view of the peculiarities of the accounting profession and acumen for continuing professional education.
Skills and Competencies	Mastery of management theories and best management practices. Ability to carry out scientific research in management, understand the organizational reality and its environment, and interpret strategies, tactics, and operations in administration. Ability to diagnose	Interpret the constant changes in legislation and standards, with mastery of technology, focusing on data analysis to bring timely information to users .

	and propose solutions to organizational problems, undertake, indicate, and develop organizational projects. Develop behavioral and attitudinal skills, namely: autonomy, innovation, cooperation, leadership, solidarity, systemic vision, excellence, permanent learning capacity, technical and scientific rigor, in the exercise of their professional attributions. Ethical behavior and social responsibility, and respect for citizenship in the practice of their profession.	
Disciplines focused on business strategy and the organization as a whole	Public and private law institutions Administration Basics Economics Applied to Management Sustainability in Organizations Historical Political Process Organizational strategy Marketing administration Brazilian Economy for Administration Crb II: Economic Formation and Social Inequalities Interdisciplinary Research Methodology Contemporary Social Theory Strategic Innovation Marketing research Agile Methods in Operations Process management Politics, State and Market: A Problem Solving Approach Organizational Consumer and Buyer Behavior Information and communication technology Organizational behavior Organizational Decision Making Trading Strategies People management	Scientific methodology Reading Practice and Text Production: Academic Genres Public and private law institutions Administration and Entrepreneurship Economy Business and Corporate Law Organizational behavior Ethics and Professional Legislation Labor and Social Security Practices and Routines Accounting Theory Auditing Fundamentals and Standards
Quantidade de disciplinas com foco em análises financeiras ou cálculos	Financial accounting Calculus I Statistics I Financial math Financial management Financial market Data analysis Planning, Management and Control of the Production of Goods and Services Logistics and Supply Chain corporate finance Multivariate analysis Operational Research	Quantitative Methods Applied to Accounting Financial Mathematics I Financial Mathematics II Interdisciplinary Thematic Seminar I, II, III, IV, V introductory accounting General contability business accounting Budget and Public Finance Tax Accounting I Tax Accounting II Corporate Accounting Structure of Financial Statements Analysis of Financial Statements

	Government Accounting I
	Government Accounting II
	cost accounting
	Cost analysis
	Accounting Administration in Rural Activity
	accounting
	tax planning
	Project Analysis and Business Budget
	Advanced Accounting
	Corporate Controllership
	Accounting Expertise and Investigation
	Audit of Private Companies
	Accounting Laboratory I and II
	Research Applied to Accounting

Note. Pedagogical Projects of Administration and Accounting courses at federal universities.

3.2.3.3 Preparation of Statements for Self-Report and Validation of Statements by Judges

After analyzing the pedagogical projects of the courses and developing the image that was used in the eye tracking software, I developed the items that are part of the questionnaire stage and the self-report applied to both studies 2 and 3. The information contained in the image became items. It was presented to the research subjects in the form of statements to describe what information they paid attention to.

Initially, 20 items were generated, 10 of which were related to the Accounting course, and 10 to the Administration course, in the two previously determined dimensions of analysis, following as a fundamental criterion the semantic adequacy, and that they maintained a clearly reflective relationship with them, enabling the correct measurement (Jarvis, Mackenzie & Podsakoff, 2003). After defining a preliminary version with the items, it was necessary to carry out a face validation (DeVellis, 2003).

Face validation was deepened through the judges (Malhotra, 2014). The objective of this step was to verify, in a group of experts, whether the items on the scale can be considered adequate to measure what is being proposed (DeVellis, 2003; Bright et al., 2012), observing the agreement of the invited group of experts (judges), with the capacity of the scale to measure each intended construct and if the scale items are clear and adequate for estimation (Gountas et al., 2012; Hardesty & Bearden, 2004).

The face validation procedure initially included the invitation to judges (experts) to return a questionnaire sent by e-mail. During face validation, the judges marked those items

they believed to be part of the contents of their area of knowledge (Administration or Accounting). The assessment of the ability to relate the item to the area of knowledge provided a score (D'arc da Silva Brito, Pinochet, Lopes & de Oliveira, 2018). Values of 0.65 or higher were considered acceptable as levels of convergent agreement (Stratman & Roth, 2002) or above 0.80, according to Hair et al. (2006).

For the composition of the panel of judges, 16 academic professionals, doctors, and researchers in their fields were invited for convenience. All professionals contacted agreed to participate in the study. However, 6 of them did not return to the survey, failing to send their answers.

After the return of the judges, it was necessary to compile the data and analyze the final result. Of the 20 items, 10 were part of the final research instrument in the self-report stage, 5 from Administration and 5 from Accounting.

3.2.3.4 Research Instrument Pre-Tests

For the proper adequacy of the experiment, I performed pre-tests recommended in experimental studies (Hauser; Ellsworth; Gonzalez, 2018). Pre-test data were collected and analyzed. A total of 20 pre-tests were performed in one week. The research instrument was developed to be applied in stages as shown in Figure 9.

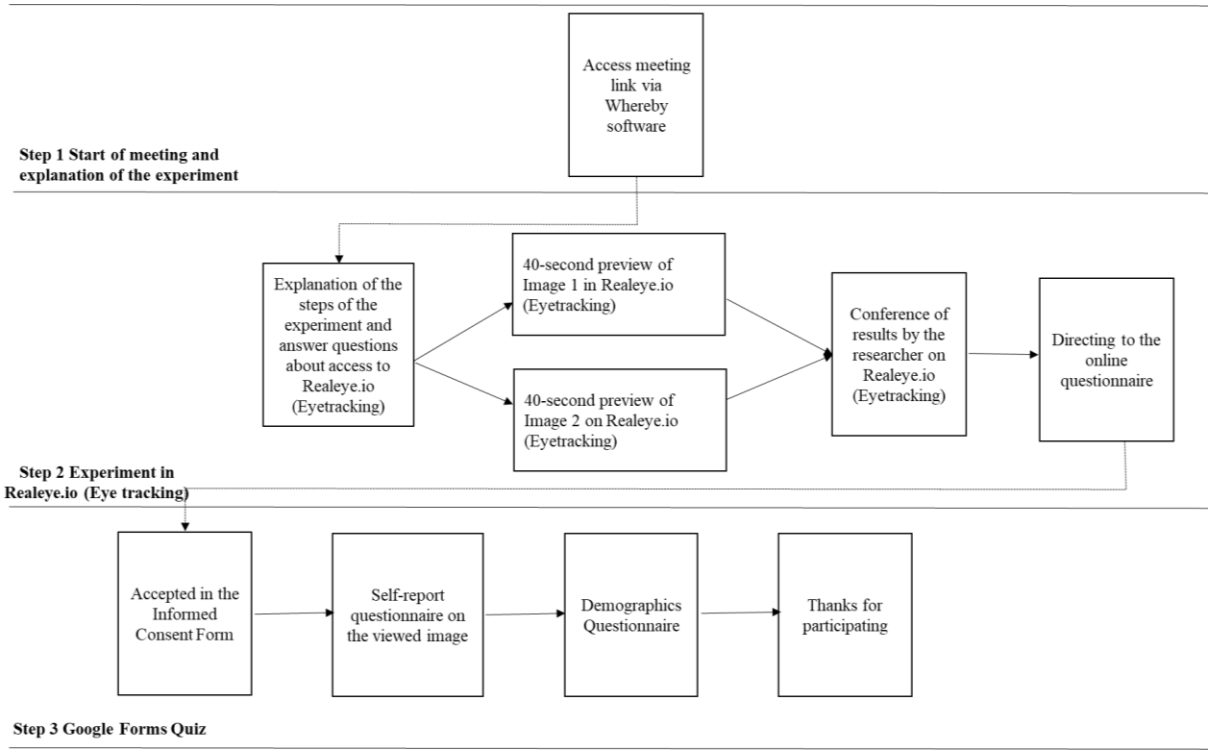
The meetings were scheduled using email and WhatsApp. Initially, I explained the importance of participation because of their experience and knowledge in the area. The average duration for carrying out the individual process as a whole was 30 minutes. After completing each pre-test and before ending the video connection, I spoke with the participants to identify weaknesses in the instrument or questions that might arise with the students at the research time.

All participants are PhDs in their respective fields and have made significant contributions to improving the instrument and process. Regarding the scales, the suggestion was to adapt the questions to the context of the pandemic. They also suggested that the scales should be standardized within the range 1 to 5, despite the number of points on the scale not interfering with the analysis, as variance was evaluated. The suggestion can be used to facilitate the completion and not generate doubts.

As it is a new and interesting method, the pre-test stage of the experiment using eye tracking was very valid. I could see that the Zoom or Google Meet application to run, but only in the browser. If they open via the app, it blocks the camera. Sometimes some plugins also block cameras. In these cases, participants could be instructed to open the test in incognito mode or another browser such as Epic. To avoid dropouts, for the realization of videos called Whereby.

Figure 9

Steps in the application of the experiment



Some participants in the pre-test started the call by cell phone, but the individuals needed to use a Windows notebook on which the eye tracking software runs to carry out the experiment. In appointments with students later, I explained the need to use the notebook in the first contact.

In addition, the pre-test participants suggested that a previous orientation be carried out for the research subjects, containing the information, an image divided into four quadrants will be displayed where information will be distributed. Still, the suggestion is that each one concentrates on the information content what catches your attention the most, as they will only have 40 seconds for viewing. It is not necessary to pay attention to the form of presentation.

After performing the pre-tests, it was necessary to compile the data and analyze the final result, which was satisfactory. Considerations and suggestions were accepted in the final instrument, highlighting the importance of this stage for the study.

3.2.3.5 Eye Tracking and its Application

Researchers try to connect neuroscience and organizational phenomena - theory and practice. However, research is still at a stage in development. Transformational versus non-transformational leaders were classified using neurological imaging (Balthazard et al., 2012). Attention, affection, memory, and desire, or preferences, were analyzed using the electroencephalogram - EEG (Geske & Bellur, 2008; Deitz et al., 2016; Pilelienė & Grigaliūnaitė, 2017). The attention, experience, taste, recall, and characteristics of the brand or personality, and decision-making were also researched with the help of neuroscientific tools (Pozharliev et al., 2015; Telpaz, Webb & Levy, 2015; Boshoff & Boshoff, 2016).

Research using neuroscientific tools is considered to have the potential to challenge and improve theories, as they help to identify cognitive processes that facilitate the analysis of various behaviors (Butler & Senior, 2007). Problems associated with research, such as misclassification or falsification, do not exist with neural-based variables as the brain cannot lie or falsify. Its assessment using neurosensitivity methods, eg, EEG, represents a highly valid measurement approach. Furthermore, these methods have temporal solid resolution and flexibility (Waldman, Balthazard & Peterson, 2011; Hannah et al., 2013).

There are several neuroscientific tools that researchers in organizational studies use. The electroencephalogram (EEG) was the first brain measurements considered non-invasive in neuroscience (Tivadar & Murray, 2019). Another tool is functional magnetic resonance imaging (fMRI). In addition to these, I can mention psychophysiological measures, measurement of nervous system activity by heart rate, and eye tracking.

In this study I use the neuroscientific eye tracking tool, a process of measuring the point of gaze, where one is looking, or the movement of an eye about the head. Of the neuroscientific tools, eye tracking is perhaps the most accessible for capturing the response by providing insight into temporal processes. By tracking the gaze, we can capture what information was processed and the order and duration of these processes, which has been used as a direct measure of attention (Venkatraman, et al., 2015).

Essential indicators in human communication are eye contact and gaze direction, as they establish a socio-emotional connection or indicate the target of our visual interest. The eye is the main gateway to the brain, and gaze activities reveal the cognitive process and provide insights into the thinking process and intentions (Land & Furneaux, 1997; Brigham et al. 2001).

The facilities of using online eye tracking software include the opportunity to get a more significant number of participants and a more diverse sample. Thus, it is possible to promote the facilitation of the generalization of results, greater data acquisition speed, the autonomy of data recording, independence of available software and hardware, and lower costs due to less time involvement of participants and researchers (Semmelmann & Weigelt, 2018).

Eye tracking provides a unique way of looking at the allocation of human attention in an extrinsic way. By identifying where a person looks, researchers can identify what drives human visual attention (Semmelmann & Weigelt, 2018). Eye tracking allows collecting and analyzing the visual path that research subjects take, which are the points of attention, pupil size, and distance, or blinking, using infrared technology, which detects the pupils of individuals while viewing the resources (Silva -Torres, Martínez-Martínez & Cuesta-Cambra, 2020). By providing more direct measures of attention, eye tracking allows the researcher to distinguish between endogenous (top-down) attention, where specific aspects of the ad are explicitly selected and processed, and exogenous (bottom-up), where stimulus characteristics attract attention and processing. These distinctions cannot be captured using traditional self-reported measures (Venkatraman, et al., 2015).

Eye movements are coupled with attention and information acquisition. Attention and information acquisition are linked to higher cognitive processes, characterized as integrating information from basic cognitive processes. Basic cognitive processes can be exemplified by perception, attention, and memory. These processes may or may not be related to higher processes such as language, intelligence, decision making, reasoning. Learning is an example of a higher cognitive process, as it is the combination of processes such as attention, memory, and thinking (Wedel, 2015).

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Participants used their devices to access the experiment online. To participate in the study, you need a PC with Microsoft Windows 10 or Mac (Macbook, iMac) with MacOS with a built-in webcam or USB webcam, Chrome browser is recommended. The required screen resolution is 1024x968 pixels or more. Only horizontal screen orientations are supported. Also, the page cannot be enlarged (Lewandowska, 2020).

After creating the study on the platform, the researcher must send the participation link to all research subjects. First, each participant sees the basic instructions and needs to enable access to the camera. Then the basic instructions are displayed, and the 40-point calibration begins. It is conducted on 3 different backgrounds - white, black and gray to minimize the influence of the monitor light intensity during the eye tracking test (it is different from the color of the displayed items). Calibration is then validated at 9 points - only by completing this step were participants allowed to continue the task (Figure 10) (Lewandowska, 2020).

Predicted looks must not be more than 300 pixels apart to be validated. Data is captured at a sampling rate of around 30 Hz (depends on webcam and internet connection). A sampling rate of 60 Hz is also possible. No images from a webcam are captured or transmitted. The

webcam is only used to calculate eye positions and is stored in the form of basic text data (Lewandowska, 2020).

Figure 10

RealEye.io instruction and calibration screens step by step

Before starting the experiment, all research subjects must be guided in relation to some points. To participate in the study, a desktop device must be used. The participant must be seated at a comfortable distance from the computer, as for regular use, using the Chrome browser, with only one tab open (the one with the eye tracking study). The webcam must be at eye level. The environment must have good lighting conditions, must not wear glasses, and keep the head still throughout the test. Some Google Chrome extensions may still block webcam access, so we recommend running the test in an incognito window.

Minimum hardware and software requirements are 640x480p @ 15 FPS webcam, with poor image quality, Google Chrome, Microsoft Edge or Mozilla Firefox, Windows 7/10, MacOS X, Linux (eg. Ubuntu). At least 0.5 GB RAM memory is available and a minimum resolution of 1024x600 px. It is recommended to verify that other software is not consuming CPU or RAM, if active websites and hosted sessions generally require a faster CPU than images or video type studies. Firefox is not recommended because it does not support hardware acceleration (Lewandowska, 2020).

After carrying out the experiment, it is possible to generate the results. RealEye provides recordings which are videos that show how the research subjects' eyes moved over the item during testing. A moving circle that appears in the video represents an area you were looking at (gaze point).

The area of interest (AOI) is an analytical tool that allows you to calculate quantitative measurements of eye movement. It is necessary to draw a boundary around an area of a chosen image that interests you to identify the desired metrics. In the case of this study, each image had four AOIs and was analyzed by the metrics Total Time (TT), Staring Looks (OF), and Average of return visits (OF_REV).

The TT metric refers to the total time spent, in seconds, by viewers on AOI, and it can mean issues related to extracting information or indicate that AOI is more attractive. The number of fixations within the AOI is the metric OF. More fixation means more visual attention and efficiency in finding information. It can also be considered as the sum of all fixation durations within a specified AOI. It is best used to assess attention distributed among targets. The OF_REV metric is related to how many times, on average, participants looked at the AOI, looked at it, looked away, and then looked back again. It measures the dynamics of visual attention using the total number of turns between a set of AOIs.

3.2.3.6 Sample Sociodemographic Information

When constructing the questions that integrate the stage of questioning about the sociodemographic information of the sample, I sought to present factual questions that ask the research subjects for information about themselves or their situation to present an adequate description of the Cozby (2003) sample.

I requested sociodemographic information related to the course, gender, age, if have already done an internship, if you have already done an internship, can you tell us in which area it was done, how long the internship was. Also, question if they would be working, in what area or function, if they have another education (undergraduate) or are taking another course, and if they are taking another course, what would it be. Finally, I asked if the students had any technical training performed before entering graduation and what area had been studied. The questionnaire applied to the study sample 2 is in Appendix B.

For study sample 3, I requested sociodemographic information related to the course, gender, age, sector of the economy in which it operates, which area and function it works in the organization, how long, years or months, do you have experience in the function or position, how considers your daily activities in the organization, if you have another training or if you are taking another course. The questionnaire applied to the sample of study 3 is in Appendix C. I emphasize that the sociodemographic questions only seek to characterize the research sample.

3.2.3.7 Procedures for Analysis of Results

For studies 2 and 3, outlier analyses were performed with the support of the Mahalanobis distance (D2). However, discarding any variable was unnecessary as the assumption of the absence of multivariate outliers was met.

In study 2, I used three software variables to analyze the data, Staring Gazes (OF), Total Time (TT), and Mean of Stares Revisit (OF_REV). The variable OF is related to the number of fixations within the AOI. More fixation means more visual attention. The TT variable is the total time research subjects spend on the AOI (in seconds). The variable OF_REV shows how many times, on average, the participants looked at the AOI, looked at it, looked away, and then looked back again.

To analyze the data from study 2 I used static T-test, Hotelling's T^2, and GLM analysis. To compare the eye tracking variables and image formats, we performed the T Test. Exploratory Factor Analysis (EFA) was performed with self-report statements. Using the independent variable categorical with two groups Profile of students, which resulted from the assessment of self-report. The dependent variable of eye tracking and the internship covariance, we performed a Hotelling's T^2, which is used when the independent variable has only two groups. There are several dependent variables, so we were able to verify whether the groups differ in the combined dependent variables (Tabachnick, Fidell & Ullman, 2007). To understand how internship influences the structural distribution of attention and the choice of information (AOI) to be viewed, we performed a GLM analysis.

In study 3, I again used three software variables to analyze the data, Staring (OF), Total Time (TT) and Time Spent (TG). The variable OF is related to the number of fixations within the AOI, more fixation means more visual attention. The TT variable is the total time spent by

research subjects on the AOI (in seconds). On the other hand, the TG variable presents the average time taken for the first visualization of the AOI in seconds.

To analyze the data from study 3, I used static T-test analysis, Exploratory Factor Analysis (EFA), and MANOVA. To compare the eye tracking variables and image formats, we performed the T-Test. Exploratory Factor Analysis (EFA) was performed with self-report statements. As three groups were identified (GE, AC and Both), the categorical independent variables, I performed a multivariate analysis called MANOVA to compare means with the dependent variables of the eye tracking tool.

The variables used in the software are the result of heat maps, graphical representations of data visualizations in which values are represented with colors. They show how attention was distributed over the image by the density of viewpoints on a map. These visualizations reveal the focus of attention of all individuals who participated in the experiment or each individual. In Figures 11 and 12, I present the example of a heat map of the fixed gazes on the image (fixed gazes on a region) and the fixations (eye movements between fixations).

Figure 11

Heatmap example – Gazes

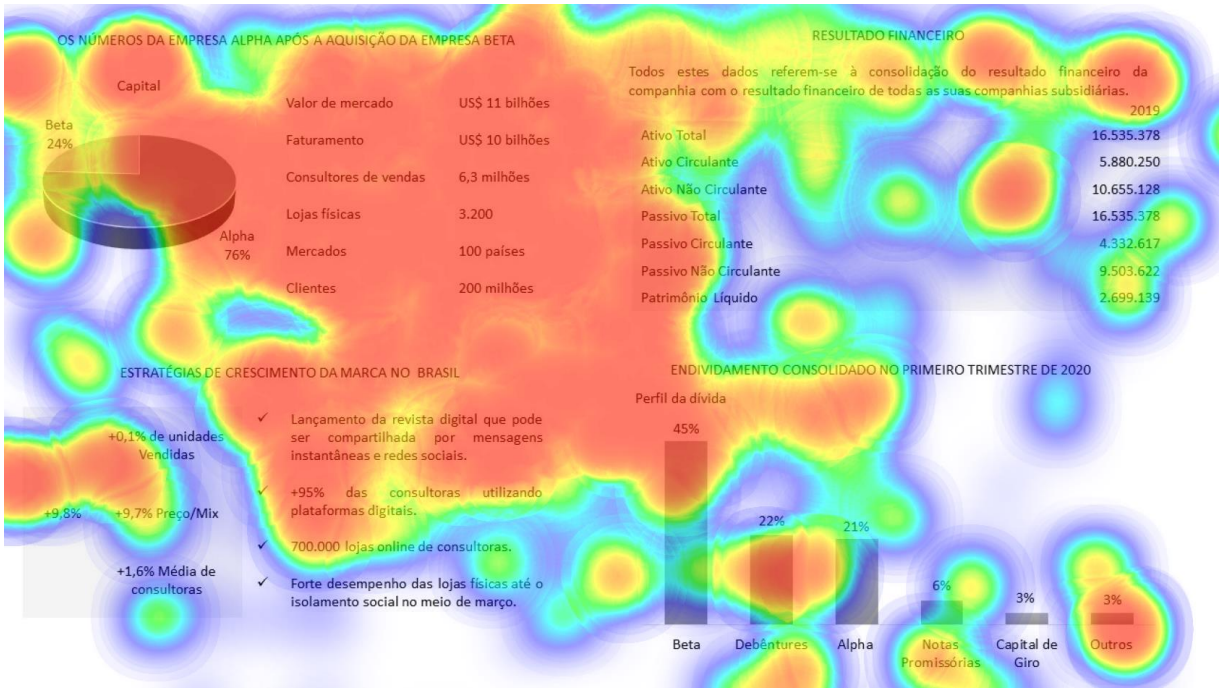


Figure 12

Heatmap example – Fixations

In Table 12, I present a summary of the procedures for analyzing the results of studies 2 and 3.

Table 12

Summary of procedures for analyzing the results of studies 2 and 3

	N total	N for analysis	Analysis	Validity
Study 2	151	151	Teste T Hotelling's T^2 GLM analysis	Internal
Study 3	140	85	T-Test Exploratory Factor Analysis (EFA) MANOVA	External

3.2.4 Analysis of Results

This section presents the results of the analysis of the allocation of attention in the AOIs of the two image formats. The definition and analysis of the professional profile for choosing information and allocation of attention. To finish, I present the analysis of the influence of the organizational environment (internship) in the allocation of attention to information choice (AOI).

The sample consisted of 47.7% (n=72) men and 52.3% (n=79) women, aged over 22 years, 98.7%(n=148). Most of them (69.5%) have no other training and no technical course (70.9%).

3.2.4.1 Analysis of Attention Allocation in AOIs of the Two Image Formats

The first analysis performed is related to Formats 1 and 2. Through a T-Test, it was possible to notice that formats 1 and 2 did not show mean differences in the three software variables (Figures 11, 12 and 13). This indicates that the allocation of attention to formats, regardless of the right or left side, text or graphics, numbers or descriptions, was equal, so it is possible to compare the variables. In other words, attention was distributed in a similar way in both formats, not necessarily the graphic was the most viewed.

We used the AOIs as the dependent variable in this test and the image formats presented as the independent variable. We did not find mean differences between image formats in the AOI result.

Figure 13

Mean difference of the OF software variable

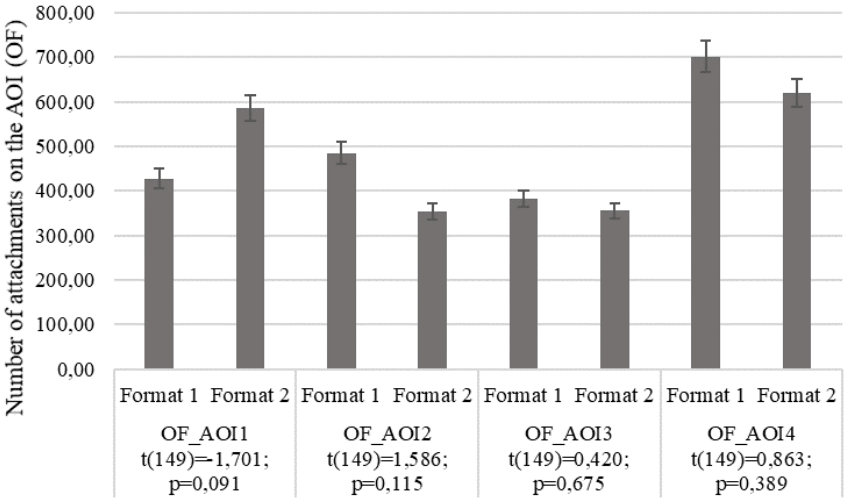


Figure 14

Software variable TT mean difference

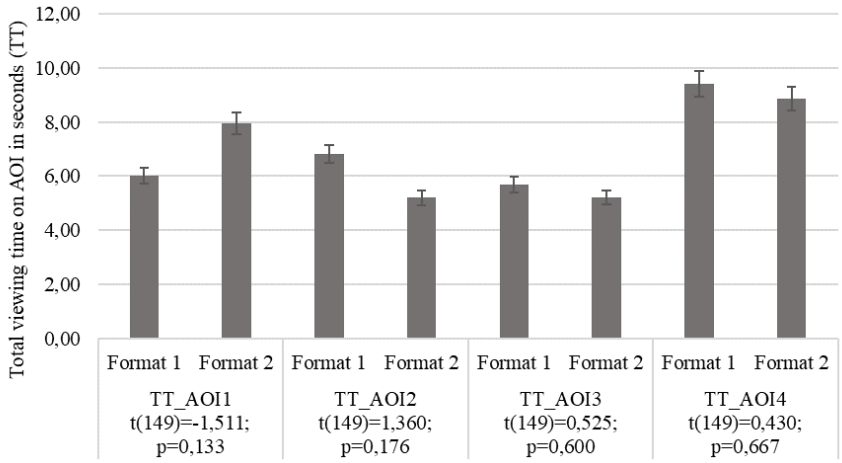
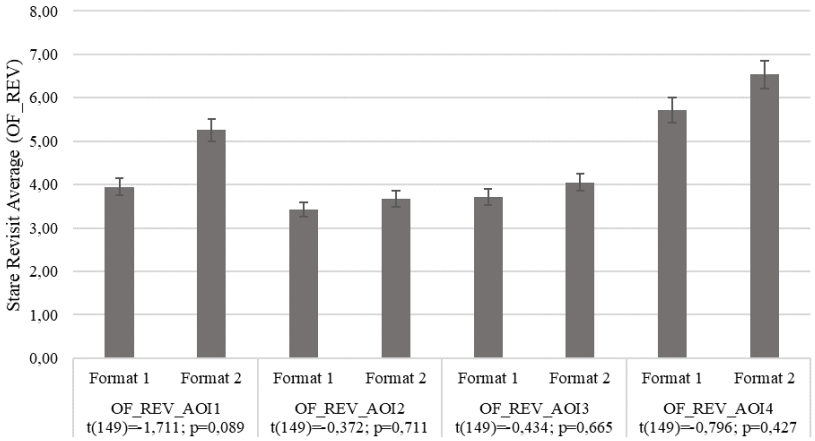


Figure 15

Software variable OF_REV mean difference



The allocation of attention in the AOIs was similarly distributed in the two formats (1-2) of the image presented as a stimulus was confirmed, thus enabling the use of the variables of the eye tracking software (OF, TT and OF_REV) to compare the areas of interest.

3.2.4.2 Definition and Analysis of the Professional Profile for Choosing Information and Allocation of Attention.

In this analysis, we created a professional profile based on self-report. To operationalize the construction of this variable, we grouped the 10 statements related to image. The research subjects answered if “I didn't pay” or “I paid attention” to the information. We performed an Exploratory Factor Analysis (EFA) with the self-report variables (Table 13). I used the Varimax Rotation, suppressed the coefficients less than 0.40 (Fox, Levin & Forde, 2013), the commonalities (h^2) below 0.50, and excluded the variables that presented cross load. Of the 10 statements, 8 were part of the final EFA (Table 2). The KMO was 0.774 (Hutcheson & Sofroniou, 1999), the total explained variance of 63.4%, and the sphericity test $p<0.001$.

Table 13

Exploratory Factor Analysis with Self-Report Answers

Self-report: Statements about the professional profile	**Professional Profile from the Administration area**	**Professional Profile of the area of accounting sciences**	**Cronbach α**
AFI_ADM2: The launch of the digital magazine that can be shared via instant messages and social networks was one of the strategies to increase sales.	.827		.826
AFI_ADM5: More than 95% of consultants using digital platforms.	.849		
AFI_ADM7: The number of online consultant stores is significant.	.766		
AFI_ADM9: The company's physical stores performed strongly until the beginning of social isolation in mid-March.	.754		
AFI_CC4: The company's current assets are greater than its current liabilities.		.787	.780
AFI_CC6: Alpha company's equity or equity is positive.		.758	
AFI_CC8: Equity is less than the company's current assets.		.789	
AFI_CC10: The value of assets is equal to the total of liabilities.		.726	

To analyze the professional profile of the sample and not just education, we created a variable for the average factor 1 (Professional profile in the area of Administration), and another one in Factor 2 (Professional profile in the area of Accounting). With these two variables, we arrived at a final variable to be identified through the means of the self-report responses. The profile of students who will have a degree in Administration is more general, it allows professionals to work in different areas of the organization, whereas training in Accounting

makes the professional more focused on acting in the financial area. These conclusions were drawn after analyzing and comparing the pedagogical projects of the two courses.

With our variable defined, we seek to understand whether the professional profile of individuals influences the choice of information for the allocation of attention. Our hypothesis 2 was confirmed after performing the Hotelling's T^2, we used the intergroup categorical independent variable with two groups, the Self-Report (ADM=1 and CC=2), referring to the professional profile and dependent variables referring to the AOIs. Of the 12 AOIs analyzed, 7 had a mean difference, which for this case was fundamental (Table 14).

For the OF and TT variables, the areas AOI1, AOI3, and AOI4 were significant, indicating that the distribution of attention based on self-report matches the professional profile. The AOI2 area that provided information about the organization's indebtedness for both groups of professional profile was similar.

Table 14

Descriptive statistics results of the Hotelling's T^2 variables

Dependent variable	N	Mean	Standard deviation	Type III Sum of Squares	Mean Square	F	Sig.
OF_AOI1	151	506.5695	576.72610	3920446.192	3920446.192	12.622	0.001
OF_AOI2	151	419.9801	509.71223	11362.006	11362.006	.043	0.836
OF_AOI3	151	368.7682	393.63580	1309356.248	1309356.248	8.871	0.003
OF_AOI4	151	660.1987	584.13043	1542332.557	1542332.557	4.854	0.029
TT_AOI1	151	6.9766	7.94516	736.353	736.353	12.480	0.001
TT_AOI2	151	6.0120	7.32073	16.903	16.903	.312	0.577
TT_AOI3	151	5.4556	5.71585	121.794	121.794	3.789	0.050
TT_AOI4	151	9.1407	8.04719	370.924	370.924	6.159	0.014
OF_REV_AOI1	151	4.60	4.719	38.479	38.479	1.727	0.191
OF_REV_AOI2	151	3.54	4.049	7.429	7.429	.449	0.504
OF_REV_AOI3	151	3.89	4.658	10.070	10.070	.460	0.499
OF_REV_AOI4	151	6.12	6.343	180.971	180.971	4.710	0.032

Note: *** p<0.001; **p<0.05.

In the case of variable OF_REV, only the AOI4 showed a mean difference. AOI4 presents the organization's strategic information, the post-acquisition data information. It is more generic and interpretive information, and this fact made the research subjects revisit the AOI. The administration profile, for which the AOI was developed, had the highest mean ($\bar{x}_{ADM} = 7{,}12$) supporting our interpretations (H1) about the structural distribution of attention.

3.2.4.3 Analysis of the Influence of the Organizational Environment (Internship) on the Allocation of Attention to Choose Information (AOI)

After the homogeneity of the regression parameters was confirmed, a Generalized Linear Model (GLM) analysis was conducted to verify whether the professional profile (grouping variable) has an effect on the allocation of attention, and whether the internship influences it as a covariate. The results showed that in the organizational environment (internship), the structural distribution of attention influences the choice of information (AOI), that is, the third hypothesis was also confirmed. We reanalyzed the 12 software AOIs, but now we use the internship covariance (Table 15).

We conclude that the professional profile of individuals in the area of Administration showed a greater mean difference in the AOIs 4 of the three variables. This AOI 4 presents information from the data after the acquisition of the organization, it is more generic and interpretive information about the organization and its strategies, that is, it is consistent with the more generalist training.

Table 15

GLM analysis results (covariant variable: internship)

Dependent variable	Type III Sum of Squares	Square Mean	F	Sig.
OF_AOI1	8689.195	8689.195	.028	0.867
OF_AOI2	37424.233	37424.233	.142	0.707
OF_AOI3	46126.130	46126.130	.313	0.577
OF_AOI4	2893870.657	2893870.657	9.108	0.003
TT_AOI1	3.050	3.050	.052	0.820
TT_AOI2	.320	.320	.006	0.939
TT_AOI3	15.161	15.161	.472	0.493
TT_AOI4	484.736	484.736	8.048	0.005
OF_REV_AOI1	2.555	2.555	.115	.735
OF_REV_AOI2	4.998	4.998	.302	.583
OF_REV_AOI3	4.050	4.050	.185	.668
OF_REV_AOI4	192.593	192.593	5.012	0.005

Note. *** p<0.001; **p<0.05.

The GLM revealed that there is an effect of the covariate on the allocation of attention. When performing the internship, the professional profile with the most generalist characteristic demonstrated that the expansion of practical experience possibilities during higher education is an alternative to meet the requirement of a multidisciplinary profile. By analyzing the image and the AOIs, this profile demonstrated a professional identity necessary to act in a situation of unpredictability, a reality that current organizations are subject to, as the AOI4 [$estágio_{OF\ AOI4}$: $F_{(1,\ 148)}$= 9.108; p=0.003; $estágio_{TT\ AOI4}$: $F_{(1,\ 148)}$=8.048; p=0.005; $estágio_{OF\ REV\ AOI4}$: $F_{(1,}$

$_{148)}$=5.012; p=0.005] presents information that is more interpretive about the organization and its strategies.

3.3 Study 3 – Attention from the Perspective of Professionals in Organizations

3.3.1 Contextualization of Study 3

ABV's central argument is related to the understanding that to explain company behavior it is necessary to explain how companies distribute and regulate the attention of their decision makers. The company's behavior is the result of how the channeling and distribution of the attention of its decision makers is carried out, which depends on which questions and answers focus their attention (Ocasio, 1997).

Therefore, organizations are seen as distributed attention systems in which there are questions to understand the environment (problems, opportunities and threats), and responses considered as alternatives for action (proposals, routines, projects, programs and procedures). In this distributed attention system, the actors, considered the managers, affect the regulation of the company through their skills, beliefs, values and attitudes, they can be internal and external, and they are those who make decisions and act in the communication channels and procedures, for this reason, not all decision makers are actors.

To understand distributed attention, in this study, I used the ABV as a theoretical basis in order to investigate the relationship between the function of professionals and their managerial attention. There is a lack of empirical research testing the structural distribution of attention and the relationship of role and managerial attention in strategy formulation.

In organizations, evidence of an organizational practice highlights its relevance to the entire process, with employee attention being directed to and affecting the degree to which information about that practice will be cognitively accessed and processed (DellaVigna, 2009; Garg et al. , 2021; Ocasio, 2011). I intend to answer the following research question in this study 3: Can the allocation of attention be affected by the function/position of professionals in organizations?

Due to the type of tool they use, most empirical studies test small samples. In study 2, when analyzing the results of future professionals or managers who will work in organizations, considering the sample size, I observed the problem of statistical power and the absence of external validity due to the sample. To complement study 2, I developed study 3 in which I aim

to assess the effect of function/position on managerial attention and the individual characteristics of professionals working in organizations.

Both study 2 and study 3 aim to relate and understand ABV from the perspective of merging the structural components of a company's environment with cognitive decision-making components, to develop a comprehensive perspective of the company's behavior and the possibility of taking decisions. strategic decisions (Ocasio 1997; 2011).

3.3.2 Conceptual Model and Study Hypothesis 3

Strategies are developed in turbulent and sometimes unpredictable environments. To make this process less dubious, it is relevant to think about promoting thoughtful engagement linking top-down and bottom-up processes of cognitive processing, leading to possible variations in established patterns of attention, cognition and meaning creation at the organization level (Ocasio and Joseph 2008). It will allow professionals to identify problems, develop alternatives for action, and provide new ways to understand organizational issues, their causes, and consequences.

Attention and the ability to process information in a team are valuable and scarce resources in an organization (Ocasio, 2011). When engaging people to focus their efforts in certain situations and not others, unconsciously the search for information and data will be restricted to resolution of the presented objective, that is, the distribution of attention will be focused, the degree of participation of professionals is the result of attention contests.

These competitions arise related to the structure of attention of the main organization and compete for the limited attention of professionals (Ocasio, 1997; Simon, 1947). These structures shape how and to what extent they direct their attention to certain events and, therefore, how they behave strategically, that is, organizations' attention structures influence the degree of participation and choices of professionals (Ren & Guo, 2011; Brielmaier & Friesl, 2021). The attention structures consist of four attention regulators, which are fundamental to understanding the participation in the operating system (Table 16).

These regulators of attention influence how attention will be distributed, but there is another factor that must be considered to understand how information is preserved within the structure of the organization. For this reason, attention is directly relevant to organizational

learning in light of the fact that organizational and actor experience is not always transformed into knowledge (Gavetti et al., 2012).

Table 16

Regulators of attention in organizations

Regulator	What is	How occurs
Rules of the game	Represent the most implicit part of the company are the principles, norms, values , and incentives, formal and informal,	They guide the actors' attention in their interpretation of organizational reality and constitute a logic of action. They create a structure in which coordination and conflict take place. They provide the criteria and interests or identities that override the idiosyncrasies of individual motives and serve as a common lens to guide the organization's members to respond to specific information inputs in the workplace.
Structural position	Are the formal roles and social identity actors in the organization, relationships with other members in corporate hierarchies or communication networks,	They are connected to the hierarchy, status, and power of actors. They are part of the organizational architecture and result in a specific focus of attention, which influences decision-making. They shape the distribution of attention by channeling a particular experience for the focal actors to respond.
Resources and routines	They are the building blocks of companies' value creation activities—cognitive schemes for organization members to assess alternatives and organizational moves to solve a problem.	The allocation and implementation of resources, as well as the performance of organizational routines, are substantial parts of organizational life and have the attention of actors.
Players	Are the actors who influence the decision-making of the organization.	They are embedded in the structures and social fabric of an organization that shape the beliefs and values that support the development of the strategy, reflecting in the direction of attention of the entire organization. They influence the distribution of other members' attention through the specific skills, values , and beliefs they bring to their organization..

Note. Adaptaded from Ocasio (1997; 2011) and Joseph e Ocasio (2012).

The structural distribution of attention, experience, learning and the attention of actors can generate knowledge as communication channels and procedures are aligned with the organization's strategy and objectives. This study examines structural and cognitive factors that collectively influence, considering the structures, regulators and other situations that influence players in organizations for decision making. For that, I propose the following hypothesis:

H1: The professional profile of managers influences the choice of information (AOI) for the allocation of attention.

The structural components of an organization and the decision maker's cognition influence the collective behavior, strategies, and decisions taken. Structural components represent the organization's environment, while cognitive components are related to decision-maker's ability to focus their attention on specific issues (Ocasio, 1997; 2011; Shepherd, McMullen & Ocasio, 2017).

3.3.3 Analysis of Results

The method and sample details were presented in Study 2.

In this section, I present the results of the analysis of the allocation of attention in the AOIs of the two image formats and the definition and analysis of the professional profile for choosing information and allocating attention. The total sample consisted of 140 executives, but for this analysis, using the methodological criteria of Matsuo (2019), I selected only those who had at least 5 years of experience. So, the analyzed sample consisted of 85 executives with an average age of 41 years, 31% were women, and 69% were men.

3.3.3.1 Analysis of Attention Allocation in AOIs of the Two Image Formats

The first analysis performed is related to Formats 1 and 2. Through a T-Test, it was possible to see that formats 1 and 2 did not show any difference in mean. This indicates that the allocation of attention to formats, regardless of the right or left side, text or graphics, numbers or descriptions, was equal, so it is possible to compare the variables. In other words, attention was distributed in a similar way in both formats, not necessarily the graphic was the most viewed. We used the AOIs as the dependent variable in this test and the image formats presented as the independent variable. We did not find mean differences between image formats in the AOI results (Figures 14, 15, and 16).

Figure 16

Mean difference of the OF software variable

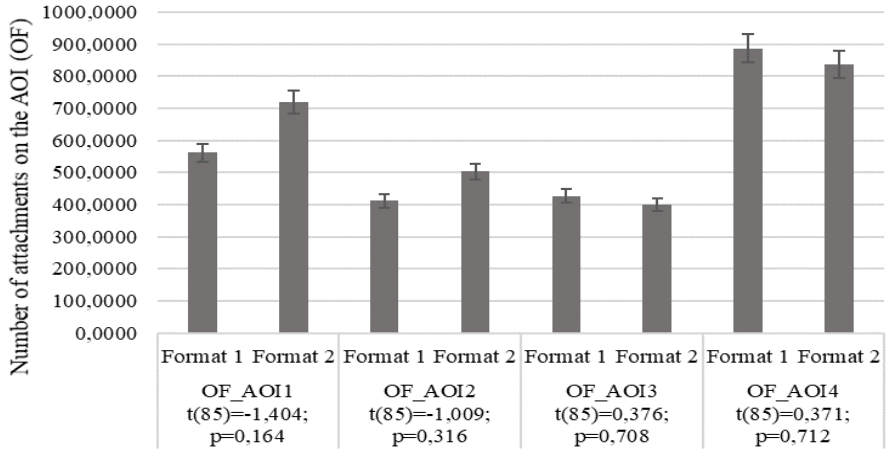


Figure 17

Software variable TT mean difference

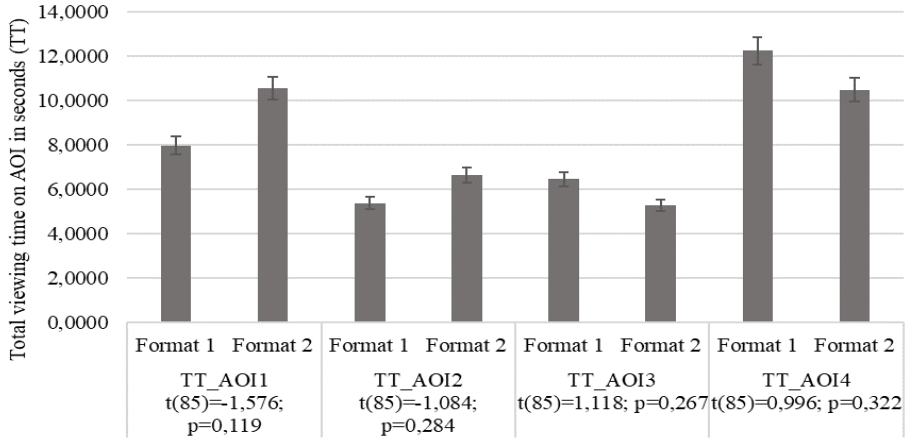
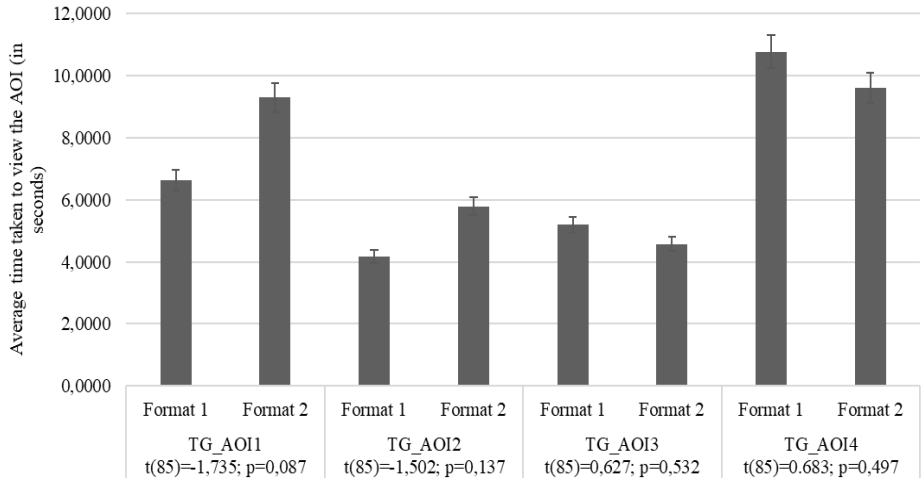


Figure 18

Software TG variable mean difference



The allocation of attention in the AOIs was similarly distributed in the two formats (1-2) of the image presented as a stimulus was confirmed, thus allowing the use of the variables of the eye tracking software (OF, TT and TG) to compare the areas of interest.

3.3.3.2 Definition and Analysis of the Professional Profile for Choosing Information and Allocation of Attention.

In this analysis I created a professional profile from the self-report. To operationalize the construction of this variable, I grouped the 10 statements related to image. The research subjects answered if "I didn't pay" or "I paid attention" to the information.

To perform this grouping, I performed an Exploratory Factor Analysis (EFA) with the self-report variables (Table 17). I used the Varimax Rotation, we suppressed the coefficients less than 0.40 (Fox, Levin & Forde, 2013), the commonalities (h^2) below 0.50 and excluded the variables that presented cross load. Of the 10 statements, 6 were part of the final EFA (Table 17). The KMO was 0.642 (Hutcheson & Sofroniou, 1999), the total explained variance was 62% and the sphericity test was $p<0.001$.

Table 17

Exploratory Factor Analysis with Self-Report Answers

	Professional profile Management/Strategic	**Administrative/Accounting professional profile**	**Cronbach α**
AFI_GE9: The company's physical stores performed strongly until the beginning of social isolation in mid-March.	.752		
AFI_GE2: The launch of the digital magazine that can be shared via instant messages and social networks was one of the strategies to increase sales.	.735		.697
AFI_GE5: More than 95% of consultants using digital platforms.	.720		
AFI_GE7: One of the brand's growth strategies in Brazil was the opening of 700,000 online consultant stores.	.702		
AFI_AC10: Asset value equals total liabilities.		.869	
AFI_AC8: Equity is less than the company's current assets.		.849	.672

To analyze the professional profile of the sample and not just its function or position, I calculated the average of the EFA grouping of 1 (Professional Management/Strategic Profile), and another of Factor 2 (Professional Administrative/Accounting Profile). With these two variables, we arrived at a final variable to be identified through the means of the self-report responses. The manager's profile who has strategic activities is more general, allowing the professional to work in different areas of the organization, while the administrative or accounting professional profile is focused on activities and routines that have defined and less strategic processes. Unlike study 2, I identified three groups in this study, as there were executives in the sample who fit into both profiles due to their answers.

With our defined variable, I sought to understand whether the professional profile of individuals influences the choice of information for the allocation of attention. Hypothesis 1 of this study was confirmed after MANOVA, we used the independent variable categorical intergroup with three groups, the Self-Report (GE=1, AC=2 and BOTH=3) referring to the professional profile and dependent variables referring to the AOIs. Of the 12 AOIs analyzed, 4 had a mean difference (Table 18).

Table 18

Results of descriptive statistics of MANOVA variables

Dependent variable	N	Mean	Standard deviation	Type III Sum of Squares	Mean Square	F	Sig.
TG_AOI1	85	8.0739	7.1225	891.044	445.522	10.840	.000
TG_AOI2	85	5.0489	4.95379	1.074	.537	.021	.979
TG_AOI3	85	4.8553	4.53408	107.396	53.698	2.719	.072
TG_AOI4	85	10.1368	7.85542	188.283	94.141	1.545	.219
TT_AOI1	85	9.3649	7.61833	967.828	483.914	10.155	.000
TT_AOI2	85	6,0667	5.39276	17.419	8.709	.294	.746
TT_AOI3	85	5,8120	4.86593	104.507	52.253	2.274	.109
TT_AOI4	85	11,2868	8.09732	199.483	99.741	1.541	.220
OF_AOI1	85	647.0471	519.34031	3955913.644	1977956.822	8.673	.000
OF_AOI2	85	460.9176	412.40841	171161.683	85580.842	.497	.610
OF_AOI3	85	412.1647	342.14265	732802.092	366401.046	3.302	.042
OF_AOI4	85	860.3059	605.22188	797971.026	398985.513	1.092	.340

MANOVA (Table 18) showed that there is an effect of profile on attention in AOIs (Pillai screening = 0.399; $F_{(4, 90)} = 1.496 = p<0.001$). For the TG, TT, and OF variables, the AOI1 area was significant, indicating that the distribution of attention based on self-report matches the professional profile of the sample. This statement is justified since AOI1 was

developed with information focused on the administrative and accounting profile, which had the highest average in all variables (TG_AOI1$\bar{x}_{AC} = 11{,}66$, TT_AOI1$\bar{x}_{AC} = 13{,}11$, OF_AOI1 $\bar{x}_{AC} = 882{,}24$).

Tukey's post-hoc test showed that there is a statistical difference between the administrative and accounting profile groups of the others, according to the means presented above. Furthermore, there was no mean difference between the AC and Both groups.

The variable OF_AOI3 also showed the difference in means in the AOI3, in which it presents strategic information about the organization. It is more generic and interpretive information, and this fact made the research subjects revisit the AOI. The management and strategic profile, for which the AOI was developed, had the highest average ($\bar{x}_{GE} = 566{,}82$) corresponding to the interpretation (H1) about the structural distribution of attention.

The results of this research highlight the premises of the ABV about the definition that managers of organizations have limited attention capacities due to attention regulators in organizations and the defined structural distribution itself. Even having more than five years of experience, the executives sought and focused their attention on the information they are used to analyzing in their work daily.

The experience they have in their positions or functions can also be a factor to be considered related to the capacity for attention to create, retain and transfer knowledge, as it also depends on the option where the attention will be allocated (Ocasio, 1997; Simon, 1947) . Experience does not always guarantee the creation of knowledge and success in the decision-making process, as attention can amplify and limit the returns to experience (Fiske & Taylor, 2013; Kahneman, 1973).

3.3 Discussion and Final Considerations of Studies 2 and 3

Some theoretical issues have been identified but not empirically addressed, as well as theoretical and practical controversies and tensions in the literature on ABV and strategic organizations. These gaps allow for the development of new research paths. To empirically understand these varieties and dimensions of managerial and organizational attention, it is necessary to develop and implement new methods to understand the processes presented and analyzed by the ABV.

The main objective of study 2 was to evaluate the effect of the professional profile and internship on the allocation of attention (individual characteristic) of future professionals in

organizations. To do so, I conducted an experiment, in which future professionals, Administration, and Accounting students from the last semesters of federal universities viewed an image with information about an organization and later performed a self-report about the points that paid more attention to the image. Data were collected by RealEye.io, an eye tracking software. Data collection was performed remotely and controlled by the researchers.

Our results demonstrate that the initial training of individuals is not always consistent with their professional profile. Individuals are distributed in different functions and end up adapting to these spaces and activities, allocating their attention to what matters for the execution of tasks, which Ocasio (1997) defined as structural distribution of attention.

Structures within an organization lead to where its decision-makers focus their attention, how stimuli are perceived, encoded and transformed into a limited set of organizational movements, i.e., an organization's structures influence where attention will be allocated. By linking organizational structure, managerial cognition and decision making, we can understand how effective an individual will be in a given organization (Barnett, 2008).

We conclude that the allocation of attention can be affected by the professional profile and the internship in future managers of organizations. The results indicated that the allocation of attention to the AOIs was similarly distributed in the two formats (1-2) of image presented as a stimulus, that is, no AOI drew more attention than the other, the allocation of attention was similar regardless the way the information was presented. Furthermore, we conclude that the professional profile of the research subjects influences the choice of information (AOIs) for the allocation of attention. Finally, we understand that in the organizational environment (internship), the structural distribution of attention influences the choice of information (AOI).

In study 2, the objective was to evaluate the effect of function/position on managerial attention and on the individual characteristics of managers working in organizations. To do so, I conducted an experiment, in which managers with more than five years of experience, from strategic areas and administrative and accounting areas viewed an image with information about an organization and later performed a self-report about the points that paid more attention to the image. RealEye.io, an eye tracking software, collected data. Data collection was performed in a remote and controlled manner.

After identifying the results, it was possible to state that the allocation of attention can be affected by the role/position of managers in organizations. The results indicated that the allocation of attention to the AOIs was similarly distributed in the two formats (1-2) of image

presented as a stimulus, that is, no AOI drew more attention than the other, the allocation of attention was similar regardless the way the information was presented. Furthermore, we conclude that the professional profile of the research subjects influences the choice of information (AOIs) for the allocation of attention.

I believe that the results found in both studies demonstrate that the extent of personal characteristics and profile influence strategic choices and decisions which will determine the organization's fate (Bressan, 2018). These characteristics will affect the perception and understanding of environmental challenges and opportunities and, consequently, decision-making (Gallén, 2006).

When relating these findings to strategy formulation, I understand that it is not simply an exercise in rationality, but rather reflects experimentation, exploration, intuition, instinct, and learning, and that there is indeed a structural distribution of attention in organizations (McCarthy, 2003; Palmié, Lingens & Gassmann, 2015; Vuori & Huy, 2015; Haq, 2017; Joseph & Wilson, 2017). Therefore, experience in positions or functions is also a factor to be considered. Still, it does not always guarantee the creation of knowledge and success in the decision-making process, considering that attention can expand or limit the consequences of the experience.

When allocating attention to one piece of information or another, managers in organizations, when asked to make a decision or develop a strategy, need to select a specific course of action (Gibcus, Vermeulen & De Jong, 2009) that leads to the choice of objectives, resources and people, and the way they are effectively will happen (Bressan, 2018). Not even the managers of organizations are able to adopt a planned and rational approach to decision making, considering that some strategies have little time to be planned and that they will not be able to obtain all the necessary information.

Therefore, managers make decisions or develop strategies through the information that the environment in which they operate within organizations provides. Through the way they allocate attention in this space, understanding that their initial training becomes less relevant than their professional profile molded with based on their professional experiences and practices. This means that, depending on the area or sector in which the manager works, information will be perceived and interpreted or taken into account differently from the other because the manager allocates his attention and has processes of perception and analysis that can be influenced that others do not (Pellegrino & Carbo, 2001). It is justified, as every

professional has a preferential way of perceiving, organizing, and using information to conduct a specific activity or strategic choice (Gallén, 2006).

The contribution of this empirical research to the ABV presents the effect of the professional profile and the organizational environment as influencers on the allocation of attention that support decision-making. Additionally, the study intends to contribute to practitioners by presenting the effect of a possible lack of attention or the generation of conflict between functions, which can be mitigated if considered in the channels of procedures and communication and attention structures (Ocasio, 1997). The use of neuroscientific tools in studies in the area of strategy is still recent, and this study can contribute by using eye tracking as a tool to measure and analyze attention, improving the method for its use in other similar experiments (Waldman, Wang & Fenters, 2019).

4 General Conclusion

In ABV, the structural components of an organization's environment are reconciled with the cognitive components of decision-makers, promoting a comprehensive perspective of the organization's behavior (Ocasio 1997; 2011). Considering this comprehensive possibility of analyzing managers' attention, the objective that guided this thesis was to understand the aspects of the structural distribution of attention that influence the attention of individuals in organizations.

To achieve this main objective, I carried out a bibliometric study and experimental studies that considered individuals and their professional profiles and their relationship with the structural distribution of attention in organizations. In Table 19, I present the contribution matrix for linking the studies.

In addition to the contributions to the advancement of knowledge described in table 19, this study contributes to the ABV literature, as it responds to calls to increase the number and quality of empirical articles analyzing the company's behavior using the ABV.

Although there is a call for multilevel studies, it is also necessary to assess whether attention by profile, experience, position in the structure is reflected in attention. Although there is a search to find the effect of managers at the lowest levels on the performance of organizations, there is still no evidence of how to make the organization be aligned around a focus of attention so that it can quickly not only cause the group act together, but also assess whether this has progressed or not.

One of the significant resistance to this, and which is not necessarily the manager's attention-taking or selective attention, but is how he aligns different perceptions and focuses of attention of individuals, whether by profile, professional orientation, training, function, and structural position so that together they can follow what is predetermined that would be the direction of the organization.

Table 19

Mooring Contribution Matrix

CENTRAL RESEARCH QUESTION What is the influence of organizational structure on individuals' attention? GENERAL OBJECTIVE Understand the aspects of the structural distribution of attention that influence the attention of individuals in organizations.			
CONCLUSIONS			
Summary of results	**Contributions to the advancement of knowledge**	**Limitations**	**Proposal for future studies**
Study1	Identification of the ABV's intellectual structure and research fronts.	Limited number of empirical researches that address ABV within organizations.	Verify the connection of stimuli received from the external and internal environment of the company and the repertoire of cognitive and cultural schemes of executives to assess the effect of the function/position on the attention and individual characteristics of professionals working in organizations.
Study 2	Empirical identification that the professional profile of individuals influences the choice of information (AOI) for the allocation of care. Another contribution is related to the identification that in the organizational environment (internship), the structural distribution of attention influences the choice of information (AOI).	As this is a study carried out with academics, future professionals, it is not possible to present the external validity of the research.	Evaluate the effect of function/position on managerial care and the individual characteristics of professionals working in organizations to ensure the external validity of the research.
Study 3	Managers of organizations have limited attention capacity due to care regulators in organizations and the defined structural distribution itself. Even having more than five years of experience, the managers focused on the information they are used to analyzing in their workdays due to their position or function.	There are limitations related to the generalization of results, considering the specificity of the sample.	I consider assessing only one level in the organization and evaluating other levels together.
Appendix	Presentation of a conceptual model that relates fundamental aspects discussed in current research in the area of strategy using neuroscientific tools. Description of the potential and challenges of using scientific tools in strategic management	Despite recognizing the potential of using neuroscientific tools in the relationship between mind and brain, due to criticisms and challenges, I suggest that researchers should be used	Conducting experiments that can address decision-making and the psychological foundations of strategic practice to identify problems related to learning and developing interpersonal skills in the context of associations. Emotional and implicit

	studies, contributing to methodological paths for new studies.	as support and other traditional research techniques to assess constructs and mechanisms related to strategic decisions and choices in organizations.	factors shape behavior in associations and neuroscientific tools can help processes and, based on that understanding, create strategies that favor the brain to function in the best way according to the objective.

GENERAL CONCLUSION

Managers make decisions or develop strategies through the information that the environment in which they operate within organizations provides and the way they allocate attention in this space, understanding that their initial training becomes less relevant than their professional profile molded based on their experiences professional practices. It means that, depending on the area or sector in which the manager works, information will be perceived and interpreted or taken into account differently because the manager allocates his attention and has processes of perception and analysis that others may influence (Pellegrino & Carbo, 2001). It is justified, as every professional has a preferential way of perceiving, organizing, and using the information to conduct a specific activity or strategic choice (Gallén, 2006).

Note: Mooring Contribution Matrix adapted from da Costa, Ramos and Pedron (2019).

As researchers, we seek to apply a wide range of emerging approaches to understanding the structural distribution of attention that involves biologically-based factors, but the environment technically conditions that. This thesis was research aligned with the emerging interdisciplinary field of neuroscience that seeks to understand interactions at the intersection of social, cognitive, and neural spheres of science, being applied to seek to analyze and understand human behavior in organizational environments (Ochsner & Lieberman, 2001; Butler & Senior, 2007).

Future surveys may be carried out with managers who occupy positions different from their initial training. In addition to studying the structural distribution of attention, the other two principles of the ABV, focus on attention and situated attention, also come from empirical research. The environment in which the company is inserted and depending on the configurations of that environment, for example, if it is more or less collaborative, can influence attention, so we suggest that empirical research be carried out to analyze this movement. Future studies can also analyze companies' two different areas from management positions professionals or even evaluate professionals from the same areas in different environments, for example, entrepreneurial orientation environments or agile environments.

Considering that attentional flexibility is necessary in organizations (Laureiro & Brusoni, 2018), future studies could analyze the recent COVID-19 pandemic that highlighted a recurrent problem in organizations related to responses to crises and unexpected events, whether large and of high frequency or variability, or not. All these changes require organizations to meet multiple and sometimes conflicting goals (Gaba & Greve 2019, Salvato & Rerup 2018) and analyze how these changes have led to significant changes in the structural distribution of attention, their determinants, and consequences may also bring relevant contributions for ABV.

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APPENDIX A

Potential and challenges for using neuroscientific tools in strategic management studies[1]

1. Introduction

Neuroscientific tools have the potential to help researchers understand executives' behavior and strategic decision-making. Implicit attitudes and emotions, automatic bodily responses, and unconscious brain processes shape how individuals think, feel and act at work (Becker & Menges, 2013). These tools are applied in different areas of knowledge, such as economics, law, marketing, and can contribute to advancing knowledge in strategic management (Powell, 2011a).

One of the important criticisms of studies in strategic management is testing the relationships without testing the explanatory mechanisms (Miller & Tsang, 2011). Powell (2011a) argues that using neuroscientific tools can be adequate to progress in this direction and contribute to advancing knowledge and practice. The argument is important because strategic management is inherently behavioral (Augier, Fang & Rindova, 2018). The support of neuroscience makes it possible to understand behavior based on brain mechanisms (Becker & Copranzano, 2010; Nofal, Nicolaou, Symeonidou & Shane, 2018).

Neuroscientific tools allow researchers to measure biological data that, complemented by other traditional collection methods, can be related to the behavior and emotions of individuals (Becker & Copranzano, 2010; Laureiro-Martínez, Venkatraman, Cappa, Zollo & Brusoni, 2015). These signals, which represent the human body's physiological reactions to stimuli, make it possible to capture the subconscious events that underlie cognition and behavior. Neuroscientific tools provide a complementary lens for strategic management studies by allowing researchers to assess human behavior at the neurophysiological level (Vom Brocke & Liang, 2014).

However, despite this potential, there are challenges to be overcome and a limited amount of empirical studies. Among the challenges, from the experience of other fields, is the limitation of techniques, especially neuroimaging, due to the response time, the expense involved and the number of the participants, and ethical problems related to the research

[1] This study was accepted for publication in the RAUSP Management Journal and will be published in 2022.

(Spence, 2019). Lindebaum (2016) has criticized the use of neuroscience in organizational studies, and it reinforces the validity of the data and vague statements about the results.

The first limitation is related to the neuroscientific tool used. There is a predominance of studies that seek to link the mind and the brain with the predominant use of neuroimaging. However, other possibilities of scientific tools also have limitations and advantages (Karmarkar & Plassman, 2019), although little explored in strategic management studies, in which neuroimaging studies have been highlighted (e.g., Laureiro-Martínez, Venkatraman, Cappa, Zollo & Brusoni, 2015). A second limitation is related to the quantity of participants and statistical validity. Lindebaum (2016) argues that although there is the argument of trust for hard data (Lindembaum & Jordan, 2014) and for the attenuation of problems related to self-report (Becker, Cropanzano & Sanfey, 2011), there are indications of the low statistical power of neuroimaging studies, which, due to limitations, are performed with a reduced sample size (Button et al., 2013). An additional concern to studies that use neuroscientific tools is related to what has been called neuroethics. It involves the implications of neuroscientific techniques that are increasingly accessible, both for research and practice. There is a need to maintain the privacy and confidentiality of data and responses necessary to protect the storage of neurological data (Waldman, Wang & Fenters, 2019).

In particular, studies related to behavioral strategy seek to understand decision-makers, especially business leaders, and the effects of decisions and actions that can influence the various forms of performance (Augier, Fang & Rindova, 2018). The use of neuroscientific tools in studies related to leadership, for example, presents challenges; with all the limitations explained above, Lindebaum and Zundel (2013) suggest a 'body-brain pattern, in which the brain is not the “ultimate cause of human behaviour, but merely one part of more complexly unfolding processes” (p. 66).

The inclusion of neuroscientific tools in research in strategic management is still under development; there are criticisms and challenges related to the limitations and their potential to support future research. Still, there is a growing number of publications that use neuroscientific tools in Applied Social Sciences. For example, with the interest of the Academy of Management to create a group to study Organizational Neuroscience. For these opportunities and challenges, to give light to research using scientific tools in strategic management, we seek to understand how neuroscientific tools are used and discussed in the ongoing research?

To answer this research question, we used a bibliometric study of bibliographic coupling. We collected data from the Web of Science and Scopus databases using the keywords "neuroscience*", "neurostrategy*", and "neuroscientific*." We refined the search using the business and management categories. We also selected the relevant periodicals in the strategic management area. We grouped the final sample resulted in 120 articles supported by exploratory factor analysis (EFA) and networks, of which 46 served as the basis for the literature review.

The results of our study enabled the presentation of a framework that relates fundamental aspects discussed in current research with the use of neuroscientific tools: neuroscience and its tools for research in organizations; emotions and information processing; interdisciplinary application of neuroscientific tools; moral and ethical influences in the decision-making process of leaders. In addition to presenting the potentials and challenges for using scientific tools in strategic management studies, our study assists in the methodological paths for studies in strategic management. However, despite recognizing the potential of using neuroscientific tools in the relationship between mind and brain, we suggest that at this stage, due to criticisms and challenges, they could be used as support and in addition to other traditional research techniques to assess constructs and mechanisms related to decisions and strategic choices in organizations.

2. Neuroscientific Tools and Their Use

Neuroscience uses different tools based on non-cognitive human brain responses. To better understand the results, potentials, and challenges, for using these tools in strategic management research, we will summarize their specifications and characteristics. We offer the tools used in research, classified considering the recording of metabolic or electrical activity in the brain that allows recording (Table 1). These records may indicate the research questions these tools may be most likely to answer. In a way, the possible records also show the limitations and the possibilities for use in conjunction with other neuroscientific tools or research techniques (Jack et al., 2017).

The tools presented in Table 1 can be classified in several ways. One possibility is the portability and cost. In this case, tools such as EEG, eye tracking, and FACS, for example, would present the possibility of being used in real environments and give access to larger

samples that would influence the statistical power (Button et al. al., 2013). It is one of the challenges when using tools like fMRI, MRI, and PET (Waldman, Wang & Fenters, 2016). These tools can also be classified by their measurements. For instance, EEG, MEG and eye tracking are accurate concerning time resolution, while fMRI is accurate to the location of the activated brain region (Murray & Antonakis, 2018). Another possible difference concerns the ethical use of tools that could indicate physical limitations and also the need to have a health specialist for interpretation (Waldman, Wang & Fenters, 2016). This would be the case of EEG and fMRI, among others. Also, according to Table 2, we can see the predominance of some tools in organizational studies. Primarily, studies use EEG, eye tracking, and fMRI, and some studies use Facial Electromyography, fNIRS, and GSR.

EEG's studies were mainly dedicated to the study of consumers (Deitz et al., 2016; Geske & Bellur, 2008; Daugherty, Hoffman & Kennedy, 2016; Telpaz et al., 2015; Pozharliev et al., 2015; Gountas et al., 2019) and leadership (Balthazard et al., 2012; Hannah et al., 2013). The extension of the use of this tool for strategy studies poses some challenges, despite its potential, is a reductionist perspective, in the behavioral strategy approach proposed by Powell (2011b). Although this perspective helps in understanding decisions and behavior, which derives from behavioral economics studies, and we include those of marketing, they work with simple alternatives for decision-making about strategic problems (Hambrick & Crossland, 2018). Concerning the leadership works of Bhaltazard and his co-authors (Balthazard et al., 2012; Hannah et al., 2013), there is a criticism of reductionism about a complex situation presented by the works of Lindebaum (Lindebaum, 2016; Lindebaum & Zundel, 2013; Lindembaum & Jordan, 2014). However, Hannah et al. (2013) 's work is considered a fine example of using neuroscientific tools (Waldman, Wang & Fenders, 2016) when using EEG measurements in conjunction with a psychometric scale. The use of the EEG, due to its portability and cost, is very attractive (Tivadar & Murray, 2018).

Another widely used tool is eye tracking. In addition to being portable, it has time resolution and is suitable for assessing attention (Ceravolo et al., 2019). It has been used in related studies to evaluate choices in decision making (Meißner, Oppewal & Huber, 2020; Ceravolo et al., 2019), consumer segmentation (Venkatraman et al., 2012), attention to objects (Federico & Brandimonte, 2019; Federico et al., 2021) and recognition of leadership (Gerpott et al., 2018; Meißner, Oppewal and Huber, 2020).

Table 1

Presentation of neuroscientific tools

Tool	Form of analysis	Description	Strengths	Limitations	Most appropriate for research that . . .	Studies that used the tool
Anatomical imaging*	Brain images	MRI scanner measures static differences in brain anatomy	Good spatial resolution. Identify differences in the volume of basic tissue types in the brain. Assess structural connectivity of brain.	The significance of differences in white matter volume is not well understood. Reliable individual difference studies require large N (>50).	Tests hypotheses about individual differences between brain anatomy/ volume/connectivity/microstructure and cognition/ behavior.	
Electroencepha-lography (EEG)*	Brain electrical activity	Electrodes placed on scalp to measure electrical changes that result from neural activity.	Longest established method. Strongest temporal resolution (with MEG). Less expensive than fMRI or MEG. Portable—not constrained to scanner. Allows for realistic interaction between subjects.	Sensitive to other sources of electrical current (e.g., muscular activity). Detect signals are not wholly spatially independent, creating an inverse problem.	Require face-to-face interaction between subjects. Test hypotheses about the timing of cognitive processes. Test hypotheses related to known and reliable ERP signatures (e.g., N400, mismatch negativity). Test hypotheses relating to high frequency neuronal oscillations (e.g., alpha, gamma).	Balthazard et al., (2012), Deitz et al. (2016), Geske and Bellur (2008) Hannah et al. (2013), Daugherty, Hoffman, and Kennedy (2016), Telpaz et al. (2015), Pozharliev et al. (2015) Gountas et al. (2019)
Eye tracking	Eye movement	Assistive technology allows you to assess and research an individual's eye movements revealing where visual attention is directed.	Identify in which areas the person fixes their attention, for how long and in what order they follow in their visual exploration. It can be done either in closed or open environments, dynamically or statically, for activities carried out in a real or	The cost of equipment and software, as most commercial products, still has a high average price. Although this technology is becoming cheaper and cheaper, and even though there are even free solutions for conducting and analyzing	It can be used in product and service interaction activities, sports, occupational or leisure activities, contributing to knowledge about eye movement and its relationship with cognitive processes.	Gerpott et al. (2018), Meißner, Oppewal and Huber, (2020), Maran et al. (2019), Federico and Brandimonte (2019), Federico et al. (2021), Ceravolo et al. (2019), Venkatraman et al. (2012), Meissner et al. (2015)

			controlled environment, allowing various applications.	experiments, the technical reliability of low-cost solutions can be challenging to assess.		
Facial Action Coding System (FACS)	Facial expressions	It is a scientific measurement system of facial actions/movements in human beings.	They can manually label almost any anatomically possible facial expression.	Labelling expressions requires trained experts.	Using the FACS methodology, it is possible to analyze the emotions displayed on the face, differentiating them through the movement of the facial muscles.	
Facial Electromyography	Mucles electrical impulses	It is a tool that measures muscle activity by detecting and amplifying the small electrical impulses generated by muscle fibers when they contract.	It is the most reliable tool to assess reactions with emotional valence by placing bipolar electrodes on two facial muscles. It is not language dependent and does not require cognitive effort or memory. It can measure the activities of facial muscles to weakly evocative emotional stimuli. It is less intrusive than other physiological measures. It is often the only useful approach when movement is not visible.	Although commonly used as an index of emotional responses, facial muscle activity is also influenced by the social context in which it is measured.	The use of facial electromyography can thus be used to verify emotional valence (positive or negative), measure Social cognition (empathic states), situational awareness. It has been used as a technique to distinguish and track positive and negative emotional reactions to a stimulus as they occur.	Minas et al. (2014), Zellars et al. (2008)
Functional Magnetic Resonance Imaging (fMRI)*	Brain metabolical activities and images	Indirectly measures neural activity via changes in oxygenation level in blood. Depends on function of	Captures entire brain. Providing rich spatial information provides a good foundation for inferences about function.	Limited to tasks that can be performed in a scanner. Cannot easily distinguish top down from bottom up signals. Measurements are not strictly quantitative	Uses localization of function, forward inference or reverse inference (see discussion). Assesses functional connectivity of regions during tasks or rest.	Molenberghs et al. (2017), Boyatzis et al. (2012), Laureiro-Martínez et al. (2014), Plassman et al. (2008), Berns and Moore (2012)

		endogenous biological mechanism by which neuronal activity leads to changes in blood flow ("neurovascular coupling").		(units are not biologically meaningful).	Assesses changes in brain function before/after intervention. Assesses neural basis of individual differences.	
Functional near-infrared spectroscopy (fNIRS)*	Brain metabolical activities	Indirectly measures neural activity by detecting changes in near-infrared light, which reflect changes in the amount of (de)oxygenated hemoglobin in the blood. Depends on neurovascular coupling, similar to -fMRI.	Has better temporal resolution, and is cheaper than, fMRI. No cost after initial purchase (e.g., maintenance). Portable. Participant does not need to remain stationary, as is the case with other imaging techniques. Similar to EEG, allows for realistic interaction between subjects.	Lower spatial resolution, and lower signal to noise ratio, compared to fMRI. Can only detect metabolic activity on the cortical surface (approximately only 4 cm underneath the skull).	Testing hypotheses for tasks that are not optimally suited for fMRI paradigms (e.g., those requiring movement or face-to-face social interaction). Also longitudinal studies given the relatively low cost of fNIRS.	Lee and Yun (2017), Meyerding and Mehlhose (2020)
Galvanic skin response (GSR)	Glands electry activity	It measures the electrical activity of glands that produce sweat in the palms of the hands and fingertips, which are more sensitive to emotions and thoughts.	The more stimulated the central nervous system is, the more sweat the sweat glands will produce and the less resistance will be measured on the electrodes, thus increasing the amplitude of the circuit's output signal. Although this response is not always visible (sweat), there is a change in skin resistance due to	Individuals may experience a gradual loss of motor faculties.	It is widely used in learning relaxation in general and to help identify situations that cause stress and anxiety.	Christopoulos, Uy and Yap (2019), Kouchaki and Wareham (2015), Reimann et al. (2012)

			psychological changes such as increased arousal and anxiety.		
Magnetoencephalography (MEG)*	Records electrical activity in the brain	Magnetometers near the scalp measure magnetic fields generated by neural activity.	More reliable and accurate than EEG because magnetic permeability of head more uniform than electrical conductivity, which simplifies inverse solution calculations.	More expensive than EEG. Not portable. Very sensitive to external noise. Signal falls off with a cube of distance - deeper brain structures very hard to detect. Most sensitive to activity in regions that are perpendicular to the skull surface. A small number of measurements per subject. Low spatial and temporal resolution compared to fMRI. Ethical issues arise from fact that this is an invasive technique involving intravenous administration of radioactive isotopes. Limit to number of scanning sessions per individual to reduce radiation exposure. Requires nearby cyclotron to produce isotopes. Accurate anatomical localization requires separate MRI scan.	Tests hypotheses about the timing of cognitive processes, neuronal oscillations and connectivity between regions. When combined with EEG, allows more signals to be detected and improved solutions to the inverse problem.
Positron emission tomography (PET)*	Recording metabolic activity in the brain	Radioactive tracer is inserted into the bloodstream.	O15 tracer measures blood flow in absolute terms. Can measure other biological markers (e.g., glucose isotope provides an absolute measure of metabolic activity).		As for fMRI, except very limited application to functional connectivity. In principle, superior to fMRI for assessing the neural basis of individual differences (absolute measure not confounded by irrelevant factors).
Steady state topography	Records electrical activity in the brain	It is a methodology for observing and	High temporal resolution: SST methodology is able to continuously track rapid	It needs to be used in conjunction with other tools.	The brain's electrical activity is recorded while participants view audiovisual material

		measuring human brain activity	changes in brain activity over a long period of time. The SST methodology is able to tolerate high levels of noise or interference due to head movements, muscle tension, blinking and eye movements. Suitable for cognitive studies where eye, head and body movements occur naturally. of signal-to-noise ratio. Can make brain to casual cognition claims with more confidence due to direct modulation of neural activity. Allows for within-participant comparisons that sidestep endogeneity concerns. Good temporal specificity possible with a single pulse. Portable—not confined to scanner. With specialized equipment, virtual lesion location can be pinpointed to regions were shown to be activated by fMRI.		and/or perform a psychological task. Simultaneously, a weak sinusoidal visual flicker is displayed in the visual periphery. Sinusoidal oscillation triggers an oscillatory electrical response in the brain known as Steady State Visual Evoked Potential (SSVEP).	
Transcranial direct current stimulation (tDCS)*	Records electrical activity in the brain	Coil is used to suppress (occasionally to enhance) neural activity using an electrical current. Single pulse (very brief effect) and repetitive pulse methods (*15 min effect) can be used.		Generally, it can only affect the dorsal, lateral, and occipital cortical surfaces (but see deep brain TMS). Directly affects only isolated regions but the impact on networks/other regions a concern and not fully known. Impact of machine noise and skeletal muscle enervation on task performance hence requires attentionful controls.	Tests hypotheses related to the necessity a particular brain region might have for cognition and behavior: tests and resolves concerns about reverse inference.	
Transcranial magnetic	Records electrical	Similar to TMS but uses a constant current	Can make brain to causal cognition claims with more confidence	Anatomical location of effects hard to assess. Less spatial and temporal	Tests hypotheses related to the necessity cortical areas might have	Camus et al. (2009)

stimulation (TMS)*	activity in the brain	applied through patch electrodes.	due to direct stimulation of neural activity. Portable. Well tolerated by participants. Can both increase and decrease neuronal excitability effects last for longer than TMS. The technique is developing rapidly with numerous technical innovations.	control than TMS. Recent metaanalysis suggests no statistically reliable effects, although ongoing advances may overcome shortcomings.	for cognition, behavior, and learning.

Note. Prepared from different sources in this work, and the items identified with * are presented in work by Jack et al. (2019, p. 425-427).

An important aspect is that eye tracking does not measure brain function, and therefore it is not used to infer a relationship between brain and behavior. However, it has the potential to assess attention and in conjunction with other tools such as EEG. Recent developments increase the flexibility of using eye tracking, such as the possibility of online use. One such example is the RealEye software (Federico et al., 2021).

fMRI has been used in research that assesses consumption experiences (Plassman et al., 2008; Berns & Moore, 2012), studies of leadership (Molenberghs et al., 2017; Boyatzis et al., 2012), and executive decision (Laureiro-Martínez et al., 2014). The fMRI can accurately indicate the areas of the brain that are activated. Despite these possibilities, it has received several criticisms due to the low statistical power of the studies, the imprecision of the statements, and the ethical challenges (Lindebaum, 2016). It is addressing research reductionism, in particular, using fMRI, Lindebaum and Zundel (2013) present the 'body-brain pattern,' with the argument that “the brain level is not always the ultimate cause of human behavior, but merely one part of more complexly unfolding processes” (p. 859).

3. Research Method and Techniques

This study used a bibliometric analysis of bibliographic coupling (Zupic, & Čater, 2015), supported by exploratory factor analysis and relationship networks techniques. Through multivariate and network analysis. Using this method, due to its empirical nature, it is possible to avoid part of the subjectivity of traditional qualitative reviews (Gregoire et al., 2006).

3.1 Data Collection and Sampling

The data was collected from a secondary source. The databases used were Web of Science and Scopus. These two databases are considered the most complete and serve as a reference for assessing the relevance of published research (CAPES, 2019).

We selected the sample by searching all articles available in the “business or management” sub-area. There was a total overlap of Web of Science journals by the Scopus database. Only articles from periodicals with an H Index above 50 were selected (Table 2), and which had “neuroscience*”, “neurostrategy*” and “neuroscientific*” in their titles, abstracts or keywords. We found 120 articles from 1990 to 2020.

Table 2

Journals with more publications in the sample

Journal	Quantidade de artigos	ISSN	Índice H
Organizational Research Methods	14	10944281, 15527425	111
Journal of Business Research	12	1482963	195
Journal of Business Ethics	11	01674544, 15730697	187
Journal of Management Information Systems	9	07421222, 1557928X	144
Harvard Business Review	8	178012	179
Journal of Management Inquiry	8	10564926, 15526542	62
Leadership Quarterly	7	1E+07	151
Journal of Management	5	01492063, 15571211	224
Human Relations	5	00187267, 1741282X	134
Journal of Organizational Behavior	4	08943796, 10991379	177

3.2 Analysis Procedure

For elaborating the bibliographic coupling analyses, we structured a matrix of co-occurrence of the sample references (Bernard & Ryan 2010). This matrix contains only documents with at least two shares by the sample, generating 105 articles. This cut was not arbitrary. The 105 articles correspond to 87.5% of the total of 120 articles. The 105 articles had a total of 10,984 shares out of 12,450 of the total articles, which corresponds to 88.2% of the total.

The co-occurrence matrix of the 105 most cited documents was prepared using the Bibexcel software. As a selection criterion for the number of components to be retained for analysis, we analyzed using information from eigenvalues (Kaiser, 1960), percentage of explained variance (Fabrigar & Wegener, 2011), screen plot graph (Cattell, 1978), and parallel analysis (Velicer, Eaton & Fava, 2000).

Both methods converged to an ideal number of four factors with 46 articles in total. The four factors explain 69% of the total variance of the matching matrix. We use an orthogonal rotation. The possibility of correlation between the components that the oblique rotations allow is not important in the analysis. We chose Varimax with Kaiser normalization among the

orthogonal rotations because it maximizes the sum of the load variances, allowing a better analysis of the relationship between the components and the documents that compose them.

The load criterion to justify the presence of certain documents in a component was that the component had a factorial load ≥ 0.5 (Comrey & Lee, 2013). The degree of reliability of the Exploratory Factor Analysis (EFA) factors was measured using Cronbach's alpha (α). It indicates the confidence, accuracy, or internal consistency of scales (Cortina, 1993). Values found for Cronbach's alpha above 0.70 are established as reliable, while those above 0.80 are very reliable (Nunnally & Berstein, 1994).

In the final result, we identified the correlation matrix analysis referring to the Kaiser-Meyer-Olkin (KMO) sample adequacy index to verify the feasibility of using factor analysis. For this sample, the KMO value of 0.825. More proximity to the value 1 for the KMO means higher commonality and better factorability of the sets of items (Kerlinger & Lee, 2008).

We use an additional method to gauge robustness to the coupling analysis (Vogel & Güttel, 2013). We build a network diagram using Ucinet (Borgatti, Everett, & Johnson, 2013), with the same matrix used in AFE. Factors were plotted over the network to allow visualization between them. We defined the names of the factors based on the detailed analysis of the joint content of the articles that comprise them.

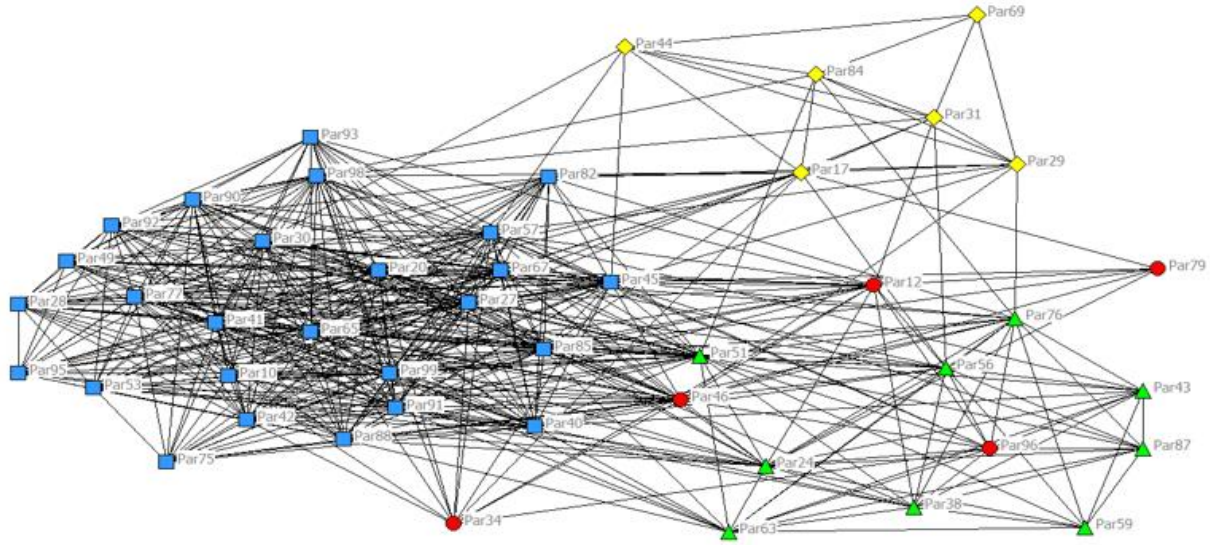
4. Results

Figure 1 presents the bibliographic coupling network of the 46 articles. We conducted a factor analysis (Table 3) and superimposed the results on the network. With this procedure, we improved the definition of the clusters. We identified four factors. The blue cluster, Factor 1, on the left of Figure 2, is the one with the most articles. It is the predominant Factor. The other factors, on the right side of Figure 1, are separated from Factor 1. The results of factor loadings, negative for the other factors about Factor 1 and vice versa, confirm that they follow an opposite direction.

Density and cohesion results (Table 4) indicate that the factors are dense (conceptual coherence exists) but deal with different issues (cohesion). The article with the highest centrality is that of Ashkanasy, Becker, and Waldman (2014). It means that this article is the most critical node, considering the links and clusters around it.

Figure 1

Bibliographic coupling network



The articles that compose Factor 1 are linked to the general theme of the article: ***Factor 1 - Potential and challenges in the use of neuroscientific tools***. We start the analysis from this factor that represents the discussion that unfolds in the other factors. There are 26 articles in this factor, that together present two aspects: shows the potential and encourage the use of neuroscientific tools in organizational studies; pose critics and are reticent to the use of neuroscientific tools in these studies.

This factor incorporates the most central article, authored by Ashkanasy, Becker and Waldman (2014). Ashkanasy, Becker and Waldman (2014) argue that despite the potential of using neuroscientific tools for organizational studies, four issues need to be discussed: neuroscientific research and reductionism; the need to address methodological and technological challenges in conducting this type of research; how neuroscientific research is meaningful in organizations; and neuroscience as just another management fad (p. 909). Ashkanasy, Becker and Waldman (2014) address each of these issues in favor of neuroscientific tools, but with parsimony. The article seems to be built with a counterpoint to the article by Lindebaum and Zundel (2013) that points out the reductionist aspects of using neuroscientific tools in leadership studies. Moreover, they go back to addressing the other aspects in Lindebaum (2016).

The dominant view in neuroscience is that the human brain is a reactive system where sensory inputs cause different neural activities, which result in responses, such as some affective process, cognitive or motor activity (Braeutigam, Lee, & Senior, 2019). By using neuroscientific concepts and tools in studies in the area of strategy, there is an opportunity to elucidate the role of mental phenomena, including conscious ones (Bagozzi & Lee, 2019). A group of authors considers that neuroscientific tools have the potential to explain behavior from biological aspects. For example, the authors explain leadership in terms of personality traits (Van Vugt & von Rueden, 2020).

Table 3

Bibliographic coupling factor analysis

References	Code	Factor 1	Factor 2	Factor 3	Factor 4	Comunalidades	Alpha de Cronbach
Jebb and Tay (2017)	Par53	0.913	-0.018	0.066	-0.028	0.840	
Molenberghs et al. (2017)	Par67	0.908	0.030	0.119	-0.008	0.839	
Tivadar and Murray (2019)	Par77	0.905	-0.008	0.107	-0.043	0.833	
Lindebaum and Jordan (2014)	Par41	0.904	-0.032	-0.001	-0.022	0.819	
Lindebaum (2016)	Par65	0.895	-0.046	0.084	-0.034	0.811	
Butler, Lee, and Senior (2017)	Par91	0.885	0.040	0.124	-0.064	0.804	
Braeutigam, Lee, and Senior (2019)	Par99	0.876	-0.006	0.253	-0.031	0.833	
Lindebaum and Zundel (2013)	Par27	0.860	-0.003	-0.087	-0.083	0.754	
Massaro and Pecchia (2019)	Par88	0.859	0.000	0.182	-0.062	0.775	
Ashkanasy, Becker and Waldman (2014)	Par30	0.858	-0.058	0.140	-0.054	0.763	
Bagozzi and Lee (2019)	Par85	0.845	-0.023	0.208	-0.011	0.759	
Lindebaum and Jordan (2014)	Par28	0.836	-0.043	-0.104	-0.058	0.714	
Lindebaum and Raftopoulou (2017)	Par92	0.824	-0.038	-0.143	-0.075	0.707	0.964
Lindebaum (2013)	Par42	0.807	-0.043	-0.073	-0.078	0.664	
Cropanzano and Becker (2013)	Par49	0.798	-0.018	0.097	-0.039	0.649	
Waldman, Wang and Fenters (2019)	Par57	0.790	-0.075	0.294	-0.048	0.719	
Nicolaou and Shane (2014)	Par40	0.783	0.142	0.068	-0.050	0.641	
Healey and Hodgkinson (2014)	Par20	0.778	-0.049	0.188	-0.003	0.643	
Van Vugt and Von Rueden (2020)	Par98	0.733	-0.103	-0.037	-0.039	0.550	
Schoeneborn, Blaschke and Kaufmann (2013)	Par75	0.731	-0.077	0.151	-0.044	0.566	
Houdek (2017)	Par93	0.722	-0.054	0.157	-0.021	0.549	
Waldman et al. (2017)	Par45	0.703	-0.069	0.333	-0.027	0.610	
Powell and Puccinelli (2012)	Par82	0.700	0.109	0.049	0.115	0.517	
Becker, Volk and Ward (2015)	Par90	0.685	-0.125	0.145	-0.078	0.512	

Lindebaum (2013)	Par95	0.685	-0.031	-0.200	-0.074	0.516	
Bagozzi et al. (2013)	Par10	0.674	-0.077	0.308	-0.001	0.556	
Meyerding and Mehlhose (2020)	Par63	-0.038	0.937	-0.039	-0.023	0.881	
Hsu (2017)	Par43	-0.097	0.922	0.032	-0.039	0.862	
Stanton, Sinnott-Armstrong and Huettel (2017)	Par38	-0.069	0.916	0.048	-0.009	0.846	
Daugherty, Hoffman and Kennedy (2016)	Par59	-0.061	0.903	-0.015	-0.03	0.819	0.909
Spence (2019)	Par51	0.201	0.862	-0.008	-0.032	0.785	
Zuschke (2020)	Par76	-0.075	0.800	-0.015	0.036	0.646	
Gountas et al. (2019)	Par87	-0.081	0.794	0.080	-0.083	0.651	
Lim (2018)	Par24	-0.028	0.791	0.034	-0.033	0.629	
Karmarkar and Plassmann (2019)	Par56	-0.043	0.775	0.019	0.018	0.604	
Lee and Yun (2019)	Par96	0.098	0.308	0.822	-0.027	0.781	
Moore and Gino (2015)	Par12	0.136	-0.013	0.817	-0.023	0.686	
Pohling et al. (2016)	Par34	0.189	-0.061	0.797	-0.002	0.674	0.842
Cropanzano, Massaro and Becker (2017)	Par46	0.354	-0.050	0.774	-0.009	0.728	
Ryan (2017)	Par79	0.034	0.042	0.739	0.158	0.575	
Anderson et al. (2016)	Par44	0.030	-0.059	0.095	0.852	0.740	
Hu, West and Smarandescu (2015)	Par29	-0.039	-0.037	0.017	0.841	0.711	
Ahn et al. (2018)	Par84	-0.117	0.092	-0.143	0.757	0.615	0.833
Moody and Galletta (2015)	Par69	-0.121	-0.082	-0.114	0.746	0.591	
Gregor et al. (2014)	Par31	-0.100	-0.044	0.037	0.711	0.519	
Riedl et al. (2014)	Par17	-0.001	-0.026	0.216	0.701	0.539	

Table 4

Factor analysis and network metrics for the bibliographic coupling

Factor	Article Qty	Explained Variance	Density	Cohesion
1 square	26	37.740	1.81	2.22
2 triangle	9	14.892	2	2.22
3 circle	5	8.562	1.6	1.83
4 losangle	6	7.987	1.86	2.15
Total	**46**	**69.181**	**Centrality** Par 30	Ashkanasy, Becker and Waldman (2014)

The identification of brain activity alone may not be sufficient to infer the requirement for such activity to perform particular behaviors or patterns of behavior (Balthazard et al., 2012). However, the evolution of organizational theories requires new and more sophisticated techniques, tools, and analytics for accurate data inferences. The testing of theories is

constrained by the practical aspects of research design and analysis, and therefore methodology and theory tend to be intertwined in a relationship of mutual influence (Jebb & Tay, 2017).

The use of neuroscientific tools in studies in management indicates continuous scientific progress, technological advances, and the reducibility of higher-order social systems to more fundamental theories of brain processes. There are a variety of concepts and forms of inquiry at different levels of analysis, and the divergence between them, rather than their unification, indicates a prosperous and thriving community of inquiry (Lindebaum & Zundel, 2013).

By conducting empirical research using neuroscientific tools, researchers will contribute to identify neurological mechanisms that underscore effects on particular situations (Molenberghs et al., 2017). Neuroscientific tools help researchers to perceive and understand the relationship between organizational behavior and the brain. It enables the analysis of specific social processes at the neurobiological level (Lindebaum & Raftopoulou, 2017).

The domain of neuroscience and its tools be applied in strategic management studies in can help researchers overcome some of the limitations, allowing a broader conceptualization and measurement of phenomena, encouraging new research directions. Among the benefits of applying these tools in research are explorations of the brain and behavior of individuals that tend to emphasize the role of unconscious processing. In contrast, most current theories of organizational behavior focus on conscious choices and resolution of existing conceptual divergences, as issues that are difficult to differentiate at one level of analysis may become more distinctive at the level of neural processing (Braeutigam, Lee, & Senior, 2019).

By highlighting the individual's behavioral aspects, these tools allow us to consider that emotions and affection accumulate broad interest. So far, these have only been assessed by psychometric instruments that have limitations, as they do not adequately capture the emotional moment and the underlying experiences of individuals (Braeutigam, Lee, & Senior, 2019). Another factor to be considered is that personality traits can influence the brain's response, so the tools and the complete interpretation of their results can point the way to new micro-foundations that promote the understanding of organizational behavior (Healey & Hodgkinson, 2015).

The application of neuroscientific tools generated significant interest and converged in the emerging field of neuroscience in organizations. This new way of collecting data in research provides strategic management research with a promise for advancing organizational research and practice (Ashkanasy, Becker & Waldman, 2014). Neuroscience in organizations offers the

opportunity to inform a variety of constructs relevant to management inquiries and advance the comprehensive research agenda in organizational neuroscience and its ecological validity (Massaro & Pecchia, 2019).

Neuroscientific tools may allow strategic management researchers to understand which neural processes support the individual's state at the time of research, or how influential factors, such as stress, can impact them. They can complement the subjectivity of self-reports and other behavioral measures, improve our understanding of constructs and their relationships, and new ways to refine theories (Tivadar & Murray, 2019), improve understanding of the relationship between organizational behavior and our brains (Lindebaum & Zundel, 2013). However, we cannot reduce complex processes and behaviors to electrochemical activity in the brain only, we need to complement and not replace traditional research methods (Becker & Cropanzano, 2010) understanding not only the physiological foundations of signals measured with a given technique neuroscience, but also the analytical and interpretive assumptions and constraints of technique.

By using neuroscientific tools in strategic management research, we may strengthen the ability to predict important organizational phenomena, understanding the ontological basis of constructs of interest, and creating a more accurate or reinforced measurement (Waldman, Wang & Fenters, 2019). When analyzing the data that neuroscientific tools generate, researchers must develop skills to transfer neuroscientific insights from the human mind to the role of individual actors in organizational contexts. For this reason, it is relevant to use, in addition to tools, other methods that can complement each other (Schoeneborn, Blaschke & Kaufmann, 2013).

Despite the many positive points related to fMRI, some authors present some negative aspects such as the validity of neuroimaging data, the use of imprecise statements, and the provision of ethically lacking theoretical and empirical advances (Lindebaum 2016; Lindebaum and Jordan 2014). Criticisms rebutted by Butler, Lee, and Senior (2017). They recognize that management, and strategic management, need firm foundations that incorporate a neuroscience perspective as a significant potential, both in terms of knowledge development and managerial and organizational effectiveness.

Neuroscientific tools allow you to assess the size and level of a specific mental capacity or executive function needed to complete particular tasks. Nevertheless, implementing these tools in research can generate a high financial cost and force researchers to deal with new ethical

considerations and dilemmas (Becker, Volk & Ward, 2015). Neuroscience and its tools hold promise for advancing organizational theories and practices, with rapid advances, new challenges, moral risks, and ethical dilemmas, which researchers must anticipate and respond to (Cropanzano & Becker, 2013). Interventions derived from this future research will create ethical risks and concerns (Lindebaum, 2013).

The lack of availability and the prohibitive expense of brain imaging technology has historically limited the application of this method in organizational settings. In the last decade, seeing the need for new ways to consider or measure many of the constructions of organizational phenomena and behaviors, neuroscience has come into evidence in management not to replace traditional approaches, but to promote an understanding that such methods did not encourage (Waldman, Wang & Fenters, 2019).

As a field under construction, neuroscience and its tools applied in studies in strategic management need more research on its results and methods so that organizations can encourage or endorse certainly proven interventions. It is an approach with the potential to address important questions and unanswered questions in the field (Nicolaou & Shane, 2014).

However, research using these tools is developing rapidly and becoming the subject of technological and methodological challenges that must be considered when conducting or interpreting research in neuroscience applied to the organization (Ashkanasy, Becker & Waldman, 2014). Some phenomena that happen within organizations have already been researched with neuroscientific methods, for example, the practice of leadership. The dominant view is that the use of the domain and neuroscientific tools offer better and refined predictions.

Controlling individual behavior is something organizations already do, and the question is whether neuroscience can help them do better, considering that structures have a substantial financial and human impact. They are not necessarily more human than the brain technologies that allow people to control their behavior (Powell & Puccinelli, 2012).

Factor 2 was named ***Interdisciplinary application of neuroscientific tools***. The nine articles that make up this factor present neuroscientific tools in marketing, and we argue about the possibilities for their use in strategic management studies. A significant amount of work uses neuroscientific tools in various disciplines such as: neuroergonomy, neuromarketing, neurogastronomy, neurostrategy, and neuroeconomics, among many others (Daugherty, Hoffman, & Kennedy, 2016). The strategic management area is still starting to use these tools, but the marketing area, mainly to analyze the behavior of consumers, has been published for a

few decades (Gountas et al., 2019; Meyerding & Mehlhose 2020; Zuschke, 2020). Companies want to understand, predict and change the behavior of those with whom they interact, advise or provide services using recent advances in neuroscience, as this method allows for understanding more about the mind, being the most effective intervention designed to date (Spence, 2019).

However, some issues limit companies' broader adoption of neuroscientific tools, such as the time needed to get an answer, the expenses involved, and the large number of participants required to answer the questions' objectives, legality, and ethics. The lack of broad access to the latest neuroimaging techniques in many emerging economies is also a significant constraint for companies worldwide (Spence, 2019).

Neuroscience domains are being used in different areas within organizations, as traditional internal and external analysis methods suffer from known limitations. They have remained virtually unchanged since their introduction decades ago (Hsu, 2017). They facilitate a more direct understanding of how brain states and other physiological mechanisms relate to phenomena, behaviors, and decision-making (Stanton, Sinnott-Armstrong & Huettel, 2017). Thus, neuroscience offers researchers and professionals from different areas a new window into the analysis processes and underlying mental activities experienced by their target markets when exposed to specific types of stimuli. This practice has great potential for advancing theory and practice (Lim, 2018).

Although the use of neuroscientific tools has made significant advances in recent years, the interface with business and the concerns of large companies remains challenging. The domain of neuroscience is one of the most fruitful approaches as it adapts the tools, techniques, methods, and understandings from the academic research that can help solve the world's business problems real people-related behavior, in a realistic timeframe, at an affordable cost and in a scalable manner (Spence, 2019).

In research, whether to assess theories or practices, it can be helpful for the researcher to choose a single method that best speaks to the issue of interest. However, engaging multiple complementary methods offer significant benefits as well as tangible evidence for results. Regarding neuroscientific tools, combining methods can allow researchers to measure the correlation and establish the causality of neural mechanisms hypotheses. That is, can apply these techniques in different areas of knowledge. However, they are not omnipotent; they

complement existing investigations, offering data, models, theories, and analyses integrated into current social science research (Karmarkar & Plassmann, 2019).

Five articles make up ***Factor 3 - Moral and Ethical Influences on Leaders' Decision-Making Process***. These articles use neuroscientific tools to investigate ethically controversial behaviors and situations.

Both affective reactions and cognitive reasoning contribute to moral judgments, although automatic affective processes dominate (Pohling et al., 2016). In organizations, decision-makers face moral issues that challenge them because the rapidly changing environment influences them, competing for pressures from different stakeholders and different observed practices or local or international business. Incorporating dynamic aspects into moral decision-making could open new avenues for understanding ethical behavior in a changing world.

Neuroscientific tools can provide insights into individual reactions to ethical issues and raise challenging normative questions about the nature of moral responsibility, autonomy, intention, and free will, offering considerable promise in the field of business ethics. In empirical research, these tools demonstrate how individuals make ethical decisions below the level of consciousness, by physiological analysis, and therefore beyond what individuals themselves can tell us.

Dominant workplace models, unethical behavior, and failure help to explain what we learn from moral psychology and cognitive neuroscience address how and why people make decisions. These decisions can be explained by intuition, affection, physiological factors that support the more deliberative reasoning process in the construction and representation of moral behavior (Moore & Gino, 2015).

Many organizational practices require ethically problematic judgments and behaviors, which can be presented using cognitive neuroscience to assess the underlying processes of moral behavior, providing a framework for understanding how it is approached, enacted, and coded (Moore & Gino, 2015). Another phenomenon to note is time constraints that can increase mental efforts and alter the outcome of moral judgments when decision-makers face ethical dilemmas. Time constraints can overwhelm brain activities and increase decision stress, possibly leading to moral incompetence (Lee & Yun, 2017).

Rationalist and moral-realist assumptions still describe most theories that address business ethics. Studies using neuroscientific tools point to the importance of morals, emotions,

and intuition in forming a moral judgment. Ryan (2017) used neuroscience related to male and female brain structures and brain chemistry. The results of recent neuroeconomic research conclude that male and female brains are structured differently. Still, different portions of their brains are used for the same tasks, often leading to identical conclusions. This study suggests that these results can benefit six areas of business ethics research: trust, moral decision-making, organizational justice, moral development, service ethics, and female management styles.

Another study that sought to understand the underlying neural mechanisms and psychological mechanisms of deontic justice used rules of justice to assess events, affective empathy and cognitive empathy. As a result, the authors identified that deontic justice is important for its good, even when it does not directly serve our self-interest. This conclusion involves psychological mechanisms, cognitive and affective empathy, and our ability to assess and apply moral rules; that is, these mechanisms are associated with neural systems that work together to form and direct an internalized sense (Cropanzano, Massaro & Becker, 2017).

Finally, six articles make up ***Factor 4 - Emotions and information processing***. Automatic or unconscious mental processes underlie much human cognition and decision-making; they likely play an important role in several other behaviors. However, neurophysiological measures alone are generally insufficient; it is advisable to use data sources to triangulate between measures (Anderson, 2016).

When we observe the role of human emotions in information systems (IS) phenomena in organizations, we need to understand through the interaction of language, physiology, and individuals' behavior. To study these information systems using neuroscientific tools in strategic management research, we need to distinguish between different emotional systems of language and physiology, choose emotion measures attentionfully, and recognize the intertwining of emotion and cognitive processing systems (Gregor et al. al., 2014).

The different emotional systems link to other human systems, which include the cognitive processing system. Emotional experiences can be directly triggered by emotion-inducing stimuli present in information systems; in turn, emotional experiences can influence resulting behaviors, such as acceptance and use of information systems and human decision making (Gregor et al., 2014).

Emotion is a critical component of people's lives and experiences and the objects they interact with. It plays a critical role in assessing high cognition and can be performed using neuroscientific tools. Emotions are related to several other processes experienced by individuals

within organizations, such as attention, memory, adaptation, self-control, stress, confidence, cognitive processes, affective aspects, social interaction, behavior, beliefs, and a series of results (Gregor et al ., 2014; Riedl et al., 2014; Moody & Galletta, 2015, Ahn et al., 2018).

Emotions can also influence how individuals get used to the information received in organizations. Neuroscientific tools can be used to analyze adaptation. They allow us to see how the brain processes familiar visual stimuli. In addition to the results provided by the tools, it is relevant to consider the biological characteristics of individuals and offer proper neurophysiological data/measures to guide the design of adaptation resistant warnings (Anderson et al., 2016).

In addition to understanding how individuals adapt to information, self-control is another factor considered relevant to be observed. It influences individual behavior, and within an organization, individuals can be just as dangerous, and potentially more than those outside it, due to their intimate knowledge of systems and the access they are adequately or inappropriately given to their routine activities. of work (Hu, West & Smarandescu,2015).

Self-control is generally defined as the exercise of control by one over oneself; it is an individual's ability to refrain from committing deviance or criminal acts under certain circumstances. Neuroscientific tools can be used to investigate the neural correlates of human decisions and self-control in organizations. They can be applied to screening employees' self-control is practical and recommended for organizations to protect themselves (Hu, West & Smarandescu, 2015).

5. Discussion

In this article we used bibliometrics to access the potential and challenges of adopting neuroscientific tools for research in strategic management. We used the bibliographic coupling analysis to verify publications on neuroscientific tools in organizational studies to verify the possibilities for studies in strategic management. The study made it possible to empirically present the current discussion on the use of neuroscientific tools in the field and indicate ways that add value to their use in the current stage of development.

Interest in using neuroscientific tools in strategic management research has grown, especially since the conceptual article by Powell (2011a), entitled Neurostrategy. These tools can enable the advancement of knowledge and approximation with real-life (Powell, 2011a),

considering that decisions and other aspects of strategic management are inherently behavioral (Augier, Fang & Rindova, 2018). However, despite this potential, there are some divergence and challenges considering their application in the current stage of development. This divergence between the potential and challenges of using neuroscientific tools has been the main debate among researchers (Factor 1 of Figure 2). We summarize this divergence that is manifested by the enthusiasm and concern of researchers.

Table 5

Enthusiasm and preoccupation about the use of neuroscientific tools

ENTHUSIASM	Neuroscience may provide a new source of data for advancing theory in the field of organizations.	Ashkanasy, Becker and Waldman (2014); Becker, Cropanzano and Sanfey (2011); Healey and Hodgkinson (2014); Lee, Senior and Butler (2012); Senior, Lee and Butler (2011); Waldman, Balthazard and Peterson (2011a); Molenberghs et al. (2017); Macoveanu et al. (2016); Jack et al. (2019).
	Neuroscience can complement psychology, allowing researchers to understand the underlying mechanisms responsible for an individual's emotional and behavioral interactions and experiences in the workplace.	Reina, Peterson and Waldman (2015); Niven and Boorman (2016); Pinazo et al. (2016); Bischoff et al. (2013); Waegeman et al. (2014); Hinvest et al. (2014); Wong, Xue and Bechara (2011).
	Neuroscience can be useful in analyzing processes related to morals, justice and values for decision making, understanding that there is a biological substrate for human morals.	Braeutigam, Lee and Senior (2019); Cropanzano, Massaro and Becker (2017); Salvador and Folger (2009); Emonds et al. (2011); Mason, Dyer and Norton (2009).
	Research in organizations needs cognitive neuroscience to benefit from the theories and discoveries of this field and add its techniques to the set of existing scientific management methods.	McDonald (2018); Balthazard et al. (2012); Laureiro-Martínez et al. (2015); Laureiro-Martínez and Brusoni (2018); Waldman, Balthazard and Peterson (2011b).
PREOCCUPATION	Research results that use neuroscience methods can be accepted in a simple way, falling short of the methodological standards of investigation methods established in organizational research.	Lindebaum and Jordan (2014); Lindebaum and Zundel (2013); Healey and Hodgkinson (2015); Lindebaum (2016); Jack et al. (2019).
	Debates on the challenges of neuroscience in different areas: neuroeconomics, neuromarketing and information systems.	Konovalov and Krajbich (2016); Fugate (2007); Lee, Broderick and Chamberlain (2007); Dulleck et al. (2011); Carter, Meyer and Huettel (2010).
	Ethical, logical and empirical reasons for using neuroscientific methods in organizational research.	Lindebaum and Jordan (2014); Lindebaum and Zundel (2013).
	Sociological inquiries about what kinds of questions arise as neuroscientific data is produced.	Pickersgill (2013)

The framework presented in Figure 2 represents the result of our bibliometric research on neuroscientific tools potential use and challenges in strategic management research.

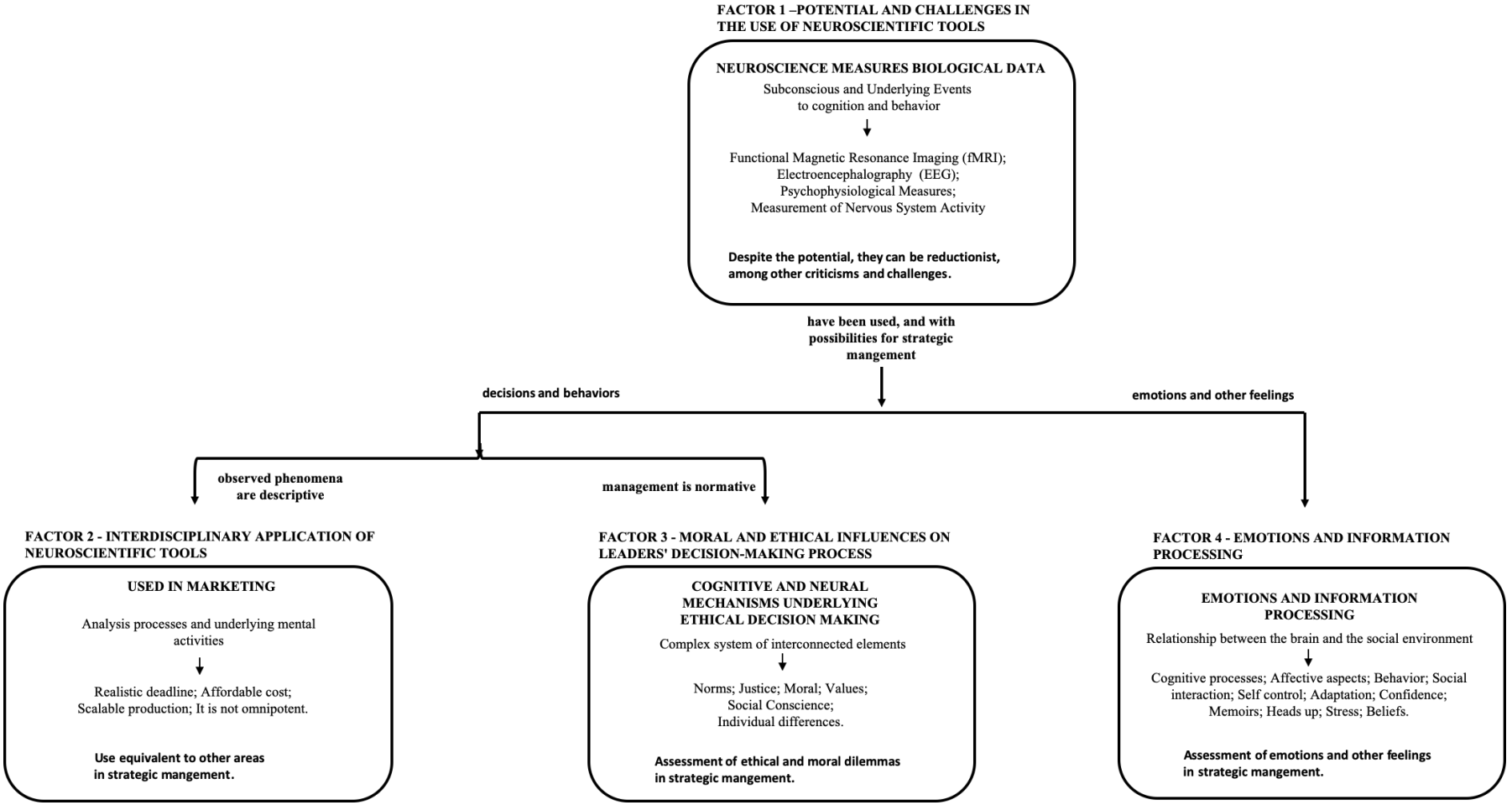
As mentioned before, the main ongoing discussion is the one that indicates the divergence in the use of these tools (Factor 1). Despite this divergence, especially the points presented by Lindebaum and his co-authors (Lindebaum, 2016; Lindebaum & Zundel, 2013; Lindembaum & Jordan, 2014). The main problem is the reductionism of a complex condition, leading to results and indications that can harm the practice instead of helping. The concerns raised by Lindebaum were debated in favor of the use of neuroscientific tools by the most central article in the sample, by Ashkanasy, Becker and Waldman (2014). We agree with Lindebaum's concern, but also from Ashkanasy, Becker and Waldman (2014), we see great potential in the use of neuroscientific tools in strategy studies.

In large part, the criticisms presented concern the use of neuroscientific tools concern tools that indicate areas of brain activation and seek to relate to behavior (Ashkanasy, Becker & Waldman, 2014; Lindebaum, 2016; Lindebaum & Zundel, 2013; Lindembaum & Jordan, 2014), such as fMRI (see Laureiro-Martínez et al., 2014). However, using neuroscientific tools in conjunction with other tools can help develop new insights and contributions. In Figure 2, two sets of works have used neuroscientific tools, those that seek to investigate decisions and behaviors (Factor 2 and Factor 3), and those that investigate emotions and other feelings (Factor 4).

On the left side of Figure 2 are Factors 2 and 3, composed of articles on decisions and behaviors. Factor 2 considers the use of neuroscientific tools in marketing and its possible extension to strategic management. And the articles in Factor 3 assess the moral and ethical influences in the decision-making process, also to be applied to strategic management.

Figure 2

Neuroscientific tools potential use and challenges in strategic management research



The articles in Factor 2, as mentioned, argue for the use of studies of neuroscientific tools in marketing. The use of these tools has focused on consumer decisions and choices, using mobile neuroscientific tools (EEG and fNIRS). The choice and attention with the research, as well as the possibility of commercial use was addressed. We can highlight two aspects of using the scientific tools presented in this Factor for application in strategic management. The first is the risk of the isolated use of neuroscientific tools. The second is that of some reductionism as commented on by Hambrick and Crossland (2018). However, we see the possibility of using these tools, but mainly eye tracking, to assess choice and attention in certain contexts. For example, the use of new methods to investigate attention from the perspective of the attention-based view (Ocasio & Joseph, 2018) that also eliminates sample size problems.

Factor 3 articles present the discussion on the possibility of studying ethical and moral aspects in decision-making. These articles, more than empirically evaluating with neuroscientific tools, are concerned with exploring the constructs and the possibility of associating moral behavior with specific brain locations and functions. Although we agree that it is interesting to evaluate the ethical and moral aspects of the decision (for example in studies that assess managerial hubris, narcissism and others linked to the upper echelon), it seems to meet the criticisms of Lindebaum's articles (Lindebaum, 2016; Lindembaum & Jordan, 2014) of reductionism and the body-brain pattern (Lindebaum & Zundel, 2013). However, we see the potential of using neuroscientific tools in conjunction with other instruments and tools to assess the presence of ethical and moral behaviors in different contexts in strategic management. In this case, portable devices, such as EEG and eye tracking, also present an opportunity. We did not identify any studies in our sample that used FACS, which now have more automated interpretation technology.

Finally, at the right side of Figure 2 we present Factor 4 intitled emotions and other feelings on information processing. Most studies mainly use EEG and fMRI to assess the activation of specific brain zones. Similar to what was presented for Factor 3, we consider it an opportunity for studies in strategic management to set emotions and other feelings, especially in situations of choice and decision-making. We also consider the use of portable equipment (EEG and eye tracking) and the use of FACS.

Our caution regarding the use of instruments and the relationship with the activation of specific brain regions, as mentioned, is due to the criticisms presented by Lindebaum. The body-brain pattern, as the brain is not the "ultimate cause of human behavior, but merely one

part of more complexly unfolding processes" (Lindebaum & Zundel, 2013, p. 66). Furthermore, although technology has progressed significantly, the use of scientific tools, depending on the type and how they are used, presents the problem of reverse inference, in which it is not possible to infer that the activation of a particular area of the brain during a task corresponds to a specific thought (Hutzler, 2014).

Human behavior is influenced by social context, but the mechanisms underlying these effects remain poorly understood. For this reason, we believe that, even though there is a long way to go, the contribution we seek to bring with this article is related to the possibility of developing and implementing neuroscientific tools in studies in the area of strategy. We note that there are different theoretical gaps and study opportunities to be created.

These tools are considered interdisciplinary applications in strategic management and make it possible to verify the analysis processes and underlying mental activities with a realistic deadline, an accessible cost, and a scalable production without considering the method as omnipotent compared to others. It is also necessary to understand that the phenomena observed will be descriptive and may affect ethical decision-making, thus interfacing with business.

By using neuroscientific tools, we have the potential to analyze the micro-foundations of individuals understood as a complex system of interconnected elements that involve the judgment of norms, justice, morals, values, social conscience, and individual differences. These analyzes of the micro-foundations of individuals by measuring biological data can be carried out if the analysis of emotional aspects. They influence information processing through the relationship between the brain and the social environment considering cognitive processes, affective, behavioral elements, social interaction, self-control, adaptation, trust, memories, attention, stress, and individual beliefs.

Research using neuroscientific tools in the area of strategy advancing due to technological innovations. Nevertheless, we understand that these innovations ignore the importance of emotions in the evaluated processes, even considering that the issue of social status dominates decision-making processes within the human brain (Wong, Xue & Bechara, 2011; McDonald, 2018).

Using neuroscientific tools, we can analyze patterns of neural activity in different situations. In the area of strategy, we can develop research to assess the understanding of social cognition in organizations, considering a deeper analysis of the phenomena occurring in specific processes. In companies, neuroscientific tools can be used for more effective selection

and placement of leaders in decision-making processes. It will be possible to gain more knowledge about the process by which choices are made.

We believe that studies in strategic management are receptive to neurokinetic domains and tools and are being used to deepen behavioral issues that challenge management knowledge, such as employee training, leadership, learning, and organizational behavior (McDonald, 2018). The identification of emotional influences on decision making (Dulleck et al., 2011), the existence of biased beliefs to the phenomena (Bischoff et al., 2013) are some studies that have used these tools in research.

Emotions play an important role in evaluating research results in the field of strategy. Neuroethics is yet another emerging field; it studies the cognitive and neural mechanisms underlying ethical decision-making. In addition to being associated with emotions, this process also needs to be evaluated and related to structures and mechanisms in the human brain (Salvador & Folger, 2009). In different situations, strategies reflect compliance with the norm, routine moral judgment, and social conscience; that is, people with different social value orientations are affected by different extrinsic incentives (Emonds et al., 2011).

The decision-making process that takes place through structured strategies is usually carried out under the responsibility of leaders, and ethical decision-making by leaders is distinguished from other types of decision-making processes. It implies an analysis beyond the conscious reasoning process, considering that emotions play a critical role and that normative approaches to morality have distinct underlying neural mechanisms. Conscious and unconscious emotions influence decision-making and ethical behavior, and only through their understanding is it possible to deepen research on leadership and business ethics (Salvador & Folger, 2009).

It is understood, then, that the ethical process of leaders is related to individual differences in the processing of emotions, which are the result of similar stimuli that promote different neural responses in people with different personalities (Canli et al., 2008). Furthermore, similar behavioral responses may also be associated with distinct neural responses depending on personality (Emonds et al., 2011).

In this context, the choice of the leaders of an organization, those who will have the decision-making power, can be carried out using neurokinetic tools that will facilitate the selection and placement of individuals. This is justified by the fact that neurological assessments, the result of scientific research, can provide an insight into the biological sources

of the behavior of those assessed. Even considering this opportunity, it is necessary to understand that identifying brain activity alone may not be enough to infer the requirement of such activity for the performance of particular behaviors or behavior patterns such as leadership (Balthazard et al., 2012).

Therefore, preferences for certain decision-making norms are associated with particular structures and mechanisms in the human brain involved in emotional processing, moral judgment, and behavior on the part of individuals (Salvador & Folger, 2009). This movement demonstrates how research and practice can use resources such as MRI to provide managers with the ability to explain their neuronal processes that influence decision-making (Emonds et al., 2011).

6. Conclusions

We conclude that research using neuroscientific methods in organizational studies seeks to analyze complex social phenomena through neurological processes. However, this is a lower-level boundary condition for studying the micro foundations of organizations. They must be contextualized in an integrated way. They should incorporate the cognitive system that expresses the relationship between our brain, the specific and shared social environment. All artefacts constitute the organizational system, considering that psychological mechanisms are as emotional as they are cognitive (Hodgkinson & Healey, 2011; Healey & Hodgkinson, 2015).

Using neuroscientific tools in research in strategy indicates continuous scientific progress and technological advances (Lindebaum & Zundel, 2013). As an interpretive framework, the tools can be understood as a paradigm that can clarify existing problems, as well as raise issues that could not be considered. Researchers can view mastering neuroscience as a tool that complements current methods and is mutually informative and enriching (Becker & Cropanzano, 2010).

In addition to the research fronts already presented, we consider it a suggestion for future work, analyzing the criticism that strategy studies often do not test their constructs or unobservable mechanisms (Miller & Tsang, 2011). We suggest using experiments that can address decision-making and the psychological foundations of the strategic practice to identify problems related to the ability to learn and develop interpersonal relationships in the context of organizations. Many emotional and implicit factors shape behavior in organizations, and

neuroscience methods can help these processes and, based on this understanding, create strategies that favor the brain to work in the best way according to the objective.

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APPENDIX B

Questionnaire applied to students.

Hi!

You are invited to participate in our survey on the structural distribution of attention.

Your participation in this study is entirely voluntary. There are no predictable risks associated with this project. However, if you are not comfortable answering a question, you can withdraw from the survey at any time. We need to know your opinion.

Your survey responses will be strictly confidential, and the data from this survey will only be reported in the aggregate. Your information will be encrypted and will remain confidential.

Suppose you have any questions at any time about the survey or the procedures. In that case, you can contact me, Nairana Caneppele, at +55 55 996313633 or by email at nacaneppele@hotmail.com.

Thank you so much for your time and support!

When proceeding, you should sign your consent for free and voluntary participation in the survey, allowing the data to be analyzed and published, maintaining, however, the confidentiality of respondents.

Let's go?

Informed Consent Form (TCLE)

We are developing research to analyze the structural distribution of attention, a principle of the Care-Based View developed by Ocasio (1997). It will result in the doctoral thesis in Business Administration by student Nairana Radtke Caneppele Bussler, from the Graduate course in Business Administration at Universidade Nove de Julho (UNINOVE), professor adviser, Dr. Fernando Antonio Ribeiro Serra from UNINOVE, and professor Dr. Luis Hernan Contreras Pinochet from UNIFESP. You are being invited to participate in this survey. Your participation is free of legal complications, and all information collected in this study is strictly confidential. You are free to refuse to participate in the research or to withdraw from it at any time and may request that your information be disregarded in the study without any constraint. As your participation is voluntary and free of charge, it is guaranteed that you will not have any additional expenses or financial compensation during the development of the research.

Researchers assume responsibility for conducting the research and guarantee that your information will only be used for this research, and the results or images may be published in events, scientific journals, or academic activities.

( ) I agree

Self-Report - Analysis of the experiment's image

Assertion	I did't pay attention	I paid attention
1. The company has a high level of liquidity for the period.		
2. The launch of the digital magazine that can share via instant messages and social networks was one of the strategies to increase sales.		
3. The company is present in 100 countries, which involves the development of managers able to deal with different cultures.		
4. The company's current assets are more significant than its current liabilities.		
5. More than 95% of consultants use digital platforms.		
6. Alpha company's equity or equity is positive.		
7. The number of online consultant stores is significant.		
8. Equity is less than the company's current assets.		
9. The company's brick-and-mortar stores performed strongly until social isolation began in mid-March.		
10. Asset value equals total liabilities.		

Informações demográficas

1) What's your course?

( ) Business Administration

( ) Accounting

2) What is your biological sex?

( ) Female

( ) Male

3) What is your age?

( ) 16 to 18 years old

( ) 19 to 21 years old

( ) 22 to 24 years old

( ) 25 old or more

4) Have you already performed or performe an internship?

( ) Yes

( ) No

4.1 If you have already had an internship, can you tell us in which area it was carried out.?

4.2 If you have already done an internship, how long have you worked as an intern?

5 If you are currently working, what industry are you in??

( ) Retail

( ) Manufacturing

( ) Service

( ) Public service

( ) Not working

2.5 If you are working, what area and function do you work in the company?

6. Do you have another education (undergraduate) or are taking another course?

( ) Yes

( ) No

6.1 If you are taking another course, what would it be??

7. Do you have any technical training performed before entering college?

( ) Yes

( ) No

7.1 If you have a technical background, what area did you attend??

APPENDIX C

Questionnaire applied to students.

Hi!

You are invited to participate in our survey on the structural distribution of attention.

Your participation in this study is entirely voluntary. There are no predictable risks associated with this project. However, if you are not comfortable answering a question, you can withdraw from the survey at any time. We need to know your opinion.

Your survey responses will be strictly confidential, and the data from this survey will only be reported in the aggregate. Your information will be encrypted and will remain confidential.

Suppose you have any questions at any time about the survey or the procedures. In that case, you can contact me, Nairana Caneppele, at +55 55 996313633 or by email at nacaneppele@hotmail.com.

Thank you so much for your time and support!

When proceeding, you should sign your consent for free and voluntary participation in the survey, allowing the data to be analyzed and published, maintaining, however, the confidentiality of respondents.

Let's go?

Informed Consent Form (TCLE)

We are developing research to analyze the structural distribution of attention, a principle of the Care-Based View developed by Ocasio (1997). It will result in the doctoral thesis in Business Administration by student Nairana Radtke Caneppele Bussler, from the Graduate course in Business Administration at Universidade Nove de Julho (UNINOVE), professor adviser, Dr. Fernando Antonio Ribeiro Serra from UNINOVE, and professor Dr. Luis Hernan Contreras Pinochet from UNIFESP. You are being invited to participate in this survey. Your participation is free of legal complications, and all information collected in this study is strictly confidential. You are free to refuse to participate in the research or to withdraw from it at any time and may request that your information be disregarded in the study without any constraint. As your participation is voluntary and free of charge, it is guaranteed that you will not have any

additional expenses or financial compensation during the development of the research. Researchers assume responsibility for conducting the research and guarantee that your information will only be used for this research, and the results or images may be published in events, scientific journals, or academic activities.

( ) I agree

Self-Report - Analysis of the experiment's image

Assertion	I did’t pay attention	I paid attention
1. The company's current liquidity is positive for the period.		
2. The launch of the digital magazine that can share via instant messages and social networks was one of the strategies to increase sales.		
3. The company is present in 100 countries, which involves the development of managers able to deal with different cultures.		
4. The company's current assets are more significant than its current liabilities.		
5. More than 95% of consultants use digital platforms.		
6. Alpha company's equity or equity is positive.		
7. One of the brand's growth strategies in Brazil was the opening of 700,000 online consultant stores.		
8. Equity is less than the company's current assets.		
9. The company's brick-and-mortar stores performed strongly until social isolation began in mid-March.		
10. Asset value equals total liabilities.		

Informações demográficas

1. Do you have a degree in which course?
2. What is your biological sex?

( ) Female

( ) Male

3. What is your age?

4. Which industry do you operate in?

( ) Retail

( ) Manufacturing

( ) Services

( ) Public service

5.1 What area of the company do you work in?

5.2 What is your role or position in the company?

5.3 How long (years or months) do you have experience in the role or position described in the previous question?

5.4 Do you consider that your daily activities in the organization can be considered as...

( ) Administrative routines

( ) Accounting routines

( ) People and organization management routines

( ) More strategic routines focused on decision-making

6. Do you have another education (undergraduate) or are taking another course?

( ) Yes

( ) No

6.1 If you are taking another course, what would it be?