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# INSTITUTIONAL THEORY MEETS NEUROSCIENCE: BRIDGING BRAIN TO CULTURE, STRUCTURE AND PROCESS TOWARDS A NEUROINSTITUTIONAL PERSPECTIVE

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# INSTITUTIONAL THEORY MEETS NEUROSCIENCE: BRIDGING BRAIN TO CULTURE, STRUCTURE AND PROCESS TOWARDS A NEUROINSTITUTIONAL PERSPECTIVE

Thesis presented to the Postgraduate Course in Administration, Federal University of Paraná, as a partial requirement to obtain the title of Doctor of Administration.

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INSTITUTIONAL THEORY MEETS NEUROSCIENCE: BRIDGING BRAIN TO CULTURE, STRUCTURE AND PROCESS TOWARDS A NEUROINSTITUTIONAL PERSPECTIVE.

Por

**DANIELLE VALENTE DUARTE**

Tese aprovada como requisito parcial para obtenção do Título de Doutora no Programa de Pós-Graduação em Administração, Área de Concentração em Administração Estratégica, da Escola de Negócios da Pontifícia Universidade Católica do Paraná.

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To all of those who directly or indirectly helped to keep myself strong to reach the finish line.

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"It is our choices that show what we truly are, far more than our abilities"
*Dumbledore*

*J.K Rowling in Harry Potter and The Chamber of Secrets, Bloomsburry Children's Books, 2018*

## ABSTRACT

This thesis is a proposal of bridging Institutional Theory and Organizational Cognitive Neuroscience. There is a constant claim for innovation on organization studies, including institutional theory. Much have been discussed about the advantages of using neuroscience as an innovative way to explain the organizational dynamic. However, there is a lack of specific works encompassing suggestions of new perspectives, ontological and epistemological bases, methods and, research designs to help and guide scholars who desires to embrace this endeavor. This thesis is an attempt to fill that gap. I propose the use of cognitive neuroscience to better understand how material and symbolic issues influence individuals and organizations under a multidisciplinary and multilevel approach. For that, I proposed the combination of the institutional logics perspective with Organizational Cognitive Neuroscience towards a Neuroinstitutional perspective. This thesis is organized in four articles aiming to guide the researcher. It includes since the presentation of the perspective, passing to ontological, epistemological and methodological issues to, finally, suggesting how to put it in practice on a research. The first article encompasses the strength, limitations and complementarity of both perspectives inviting the reader to understand the Neuroinstitutional Perspective, its objectives, and contributions. The second article discusses the necessity of innovation in management and organization studies through the combination of perspectives. It focuses on ontological and epistemological issues presenting the Critical Realism as ontological pillar and a requirement suitability for researchers who desires to blend theories and perspectives. The third article is a guide of neuroscientific methods and techniques most used in cognitive neuroscience and how to apply it to understand the institutional logics micro-foundations. The fourth article presents the multiparadigm research as a suggestion of how to conduct empirical research under the Neuroinstitutional perspective taking one of the institutional logics microfoundations – focus of attention – as an example. Finally, it is possible to affirm that the Neuroinstitutional perspective is a promising way for better understanding the role of individual actors' cognition on the organizational adaptation to institutional logics.



Keywords: Institutional Logics, Organizational Cognitive Neuroscience, Cognition

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# SUMMARY

# 1. INTRODUCTION

Institutional Theory is a metatheory that encompasses a large number of concepts under different perspectives and it is continuously growing with new ideas being incorporated.

The institutional logics perspective is one of the innovative ideas that provided a new way to understand the effects of institutional pressures over organizations. Instead of assuming that organizations would respond those pressures through an isomorphic behavior, this new approach, proposed by Friedland and Alford (1991), highlights the role of agency, structure and interpretation to explain how individuals and organizations respond a set of material and symbolic constructions, represented by a constellation of logics that can shape organizational action and guiding the organizational interpretation and operation. Those central logics – capitalist market, bureaucratic state, family, democracy, and religion - are multiple, independent and, in some cases, contradictory and are constantly competing for a higher influence in all society domains.

The role of the individual actor in interpreting the logics is prominent to understand how organizations will react to institutional pressures. The agency capacity is highlighted by institutional logics perspective and the ability of material and symbolic issues to enable and constrain individuals' actions guiding behavior and cognition expanded the restricted rational (seeking efficiency) and nonrational (seeking legitimacy) views of organizational actors (Durand & Thorton, 2018).

Phenomena related to cognition, such as focus of attention, decision making and, social interaction, play an important role on explaining the organizational responses to institutional logics (Thorton, Ocasio & Lounsbury, 2013). Individual cognition affects action. And action only occur because of the existence of biological functions that coordinate the individual thinking impacting, directly, on interaction and organizational adaptation. Although being subject to a series of stimulus, such as social and environmental influences, human behavior depends on brain functions. Following this idea, I intend here to bring a new perspective to institutional theory: the broadening of its multilevel character considering also what happens inside the individual blackbox: the brain.

To achieve this goal, I propose the use of the Organizational Cognitive Neuroscience (OCN). OCN is an applied form of Cognitive Neuroscience which studies human thought and its relation to other biological functions to explain how physical and biological parts of the brain influence or create less tangible phenomena, for instance, thoughts, emotions, behaviors, and memories.

The OCN proposal is the use of methods, techniques and concepts of cognitive neuroscience to provide new or complementary explanations about organizational life. It is a multidisciplinary approach concerned to understand the processes within the brain that are responsible for decision, interaction, attention and other human behaviors that occur inside the organizations or in response to organizational or institutional manifestations (Butler & Senior, 2007; Butler et al. 2016; Butler, 2017).

The OCN premises seeks to guarantee that neuroscience methods and techniques will not be used isolated to understand organizational phenomena. Instead, OCN is a multidisciplinary perspective that emerged to provide a multilevel explanation of organizational life considering the context where the individuals under analysis are embedded. Those characteristics position the institutional logics and OCN as complementary disciplines and its use to understand organizational phenomena towards a neuroinstitutional perspective is a promising way to guarantee that the holistic character of organizations is being taken in account.

Context is important for both perspectives under study on this thesis. Guided by this premise of context, I would like to contextualize the reader about how this work was built. At a first moment, this thesis had been conducted as an empirical study in which organizational cognitive neuroscience would be used to better understand how material and symbolic practice affects the social interaction. Specifically, through the study of language: spoken – through discourse analysis – and no spoken – through body language and emotions. The data would be collected in a logistic company located in Maputo, Mozambique. Board meetings would be recorded, and the material collected would analyzed in a software capable to capture and describe emotions and body language with the supervision of two professors from Aston University, UK – Michael Butler, PhD and Carl Senior, PhD – where I spent six months learning about OCN and the techniques available. With that, it would be possible to analyze not only what was being said by the board members, but also what was being showed by their behavior and emotions.

Unfortunately, the world is facing a pandemic time due the COVID-19 and, a week before the data collect starts, the company sent all expatriate employees back to their countries. The meetings started to be conducted online and the use of the webcam is optional. The fact that turns the data collect not possible at the moment.

Because of the uncertainty about how the situation would be back to normal, the thesis had to change for a theoretical discussion. I opted to propose the neuroinstitutional perspective encompassing since ontological and epistemological issues, to how to conduct those two different lenses together in a study to understand a given phenomenon. Following the

Cambridge guide of How to Prepare a Scientific Doctoral Dissertation Based on Research Articles (Gustavii, B, 2012) this thesis is divided in four articles.

The first article is a general introduction presenting the Neuroinstitutional Perspective and the basis used to propose it. I present the institutional theory, its variety of nuances and levels of analysis and its growing through the rising of new concepts and perspectives. The organizational cognitive neuroscience, its concepts and premises, is also presented. I analyzed the limitations and strengths from both approach justifying the contributions that putting those perspectives together can bring to organizational and management studies.

The second article discusses the necessity of innovation in organization and management studies advocating the importance of bring concepts and perspectives from foreign fields to explain organizational phenomena. Illustrated by the Neuroinstitutional perspective supported by Critical Realism, I propose a requirement suitability for researchers who, seeking for innovation in our field, wants to blend theories but not taking the risk of ontological and epistemological traps, reductionism and lack of context.

The third article is a guide of the most used neuroscience techniques by cognitive neuroscientists. Several articles are discussing the advantages of using neuroscience to explain organizational phenomena. However, we still miss practical guides that can shed light on the way to help organization and management scholars, who have no previous contact with neuroscience but wants to use it in their studies. Besides to present the techniques, its strengths and limitations, I suggest some research themes that can be studied using the neuroinstitutional perspective to understand the microfoundantions of institutional logics and how to combine the techniques with some methods already used in our field such, for instance, interviews and discourse analysis.

The fourth article presents the multiparadigm research as a way to conduct a study using the institutional logics and the organizational cognitive neuroscience together. I exemplify the multiparadigm research with a proposal of using neuroscience to understand how the focus of attention is influenced by institutional logics through three different, but complementary, frameworks.

Those four articles are an attempt to present an innovative perspective. The innovation is represented by the use of OCN as a new layer capable to provide a broader understand about the influences of institutional logics on organizational life. The contributions are: a) for OCN perspective, I present a possibility to use a metatheory that is capable to cover one of the major critics to OCN: the reductionism. Once the institutional logics is a multilevel perspective, it enables the researcher to study phenomena under top-down and/or bottom-up analysis from

macro level to individual's brain and vice versa; b) the possibility of ontological and epistemological reflections about the challenges of blending social and natural sciences; c) a guide and research suggestions for organization and management scholars who desire to use OCN in their studies but are not familiarized with the theme, methods and, techniques; d) the proposal of the multiparadigm research as way to conduct and organize a study using the Neuroinstitutional perspective. Besides those contributions, I would like to thighlight that, even being focused on the Neuroinstitutional perspective, the present thesis can also contribute as a starting point to researchers that desires to use OCN combined with other theories and perspective.

Organizations are complex. Constituted by people in constantly interaction and by technology. Influenced by material and symbolic constructions - capitalist market, bureaucratic state, family, democracy, and religion. Permeated by different nuances and under different contexts. All those multiple features give to organizations a holistic character that demands broader and complex approach to better understand its reality. I believe that bringing OCN to institutional logics towards a Neuroinstitutional perspective represents a refreshing and innovative step to our field shedding light to an important part that constitutes the organizational behavior: the human brain.

## REFERENCES

Butler, Michael Jr; Senior, Carl. Toward an organizational cognitive neuroscience. Annals of the New York Academy of Sciences, v. 1118, n. 1, p. 1-17, 2007

Butler, Michael JR et al. How Organizational Cognitive Neuroscience Can Deepen Understanding of Managerial Decision-making: A Review of the Recent Literature and Future Directions. International Journal of Management Reviews, v. 18, n. 4, p. 542-559, 2016.

Butler, M. J. (2017). Organizational cognitive neuroscience–potential (non-) implications for practice. Leadership & Organization Development Journal, 38(4), 564-575.

Durand, R., & Thornton, P. H. (2018). Categorizing institutional logics, institutionalizing categories: A review of two literatures. *Academy of Management Annals*, *12*(2), 631-658.
Friedland, Roger; Alford, Robert R. Bringing society back in: Symbols, practices and institutional contradictions. 1991.

Gustavii, B. (2012). *How to prepare a scientific doctoral dissertation based on research articles*. Cambridge University Press.

Thornton, Patricia H.; Ocasio, William; Lounsbury, Michael. The institutional logics perspective. John Wiley & Sons, Inc., 2013.

# 2. CHAPTER 1 - TOWARDS A NEUROINSTITUTIONAL PERSPECTIVE: GENERAL INTRODUCTION

What is the role of the individual actor for organizational adaptation to institutional logics?

The field of organization studies is continuously evolving. Alongside different theoretical optics that have been developed, institutional theory deserves to be highlighted not only because of the large number of researchers dedicated to this organizational perspective of analysis but also due to the discussions generated around the approaches proposed and used by scholars.

Institutional theory considers that environmental forces – cultural, political, societal, and even symbolic – are stronger conditioning agents to organizational understanding. This approach opposes the idea that organizations are based only on the bureaucratic rationalism spirit exclusively focused on building their structures for competition and efficiency. However, even putting rationalism aside at the beginning of its rising, institutional theory has evolved and brought back the individual's role and agency capacity instead of ignoring that actors are rational and endowed with cognitive ability.

The first studies carried out by Selznick aimed to understand how institutions work to integrate organizations based on universal rules, contracts, and authority (Thorton & Ocasio, 1999). In the 1970s, researches started to introduce the role of culture and cognition in institutional analysis, the organizational conformity to rules (macro perspective) and the role of culture persistence as an institutionalization measure (micro perspective), both emphasizing the taken-for-granted nature of organizations - when rules are defined by the social-culture environment where organizations are embedded and are transmitted by cognitive categories and belief systems that are taken by the organizations as true driving to isomorphism. (Meyer & Rowan, 1977; Zucker, 1977, DiMaggio & Powell, 1983).

Following institutional theory development, the institutional logics perspective arose as an alternative to the predominant definitions that restricted institutional pressures to which organizations are submitted and its isomorphic behavior.

The first concept of institutional logics was presented by Friedland and Alford (1991, p.248), who defined it as the set of material practices and symbolic constructs present in a field. These logics correspond to institutional arrangements' organizational premises and are based in a symbolic way, organizationally structured, politically defended, technically and materially restricted, with specific historical limits. The authors proposed central logics that restricts the

meanings and purpose of individual behavior and provides sources of action and change constituting individuals, organizations, and society. These central logics are the capitalist market, bureaucratic state, family, democracy, and religion.

Later, Thorton and Ocasio (1999) integrated into Friedland and Alford's perspective, three necessary and complementary dimensions of institutions: structural, normative, and symbolic. Thus, Institutional Logics are a comprehensive set of principles that prescribe how to interpret organizational reality, what constitutes appropriate behavior, and how to succeed. In other words, institutional logics guides how to interpret and operate in social situations, being or not mutually incompatible. (Thornton, 2004; Greenwood et al., 2011).

While the neoinstitutionalism of Meyer and Rowan (1977) and DiMaggio and Powell (1983) was constructed based on structural effects on organizations with a limited role of actors' agency, one of the main contributions to institutional logics approach brought by Friedland and Alford (1991) is the highlight on the interaction between three levels: **society, organization, and individual**. Although interdependent, these three levels are autonomous with individuals competing and negotiating, organizations in conflict and coordination, and institutions in contradiction and interdependence.

Thorton, Ocasio, and Lounsbury proposed a model explaining the microfoundations of institutional logics (2013, p.85), called the Cross-level Model of Institutional Logics, considering the interrelations between macro and micro levels of analysis. This model highlight, the agency capacity of actors.

It is known that Institutional Logics lead organizations to develop structures and processes to shape individual or group attention affecting action and cognition. Besides, the existence of environmental stimuli as non-routine organizational events, depending on their importance, can also drive individual cognition affecting their actions. However, we must consider that there are biological functions behind these processes responsible for coordinating the individual thinking, and consequently, group interaction and organizational adaption to institutional logics. Although being subjected to sociocultural and environmental influences, the behavior of the individual depends on the function of the brain since it is that who will coordinate the actors' actions.

A better understanding of organizational phenomena, the processes involved, and the management of these processes has been an object of organizational research and practice for decades. The enigma involving the functioning of managers' thinking began to be uncovered about 30 years ago through cognitive neuroscience. Cognitive neuroscience studies the functioning of human thought and its relation to biological functions. As a discipline, it attempts

to explain how the physical and biological parts of the brain influence or create less tangible phenomena such as thoughts, emotions, behaviors, and memories.

The term organizational cognitive neuroscience (OCN) has its origins from the search for coherence in the attempts to use cognitive neuroscience methods to explain organizational phenomena and can be considered a multidisciplinary approach in terms of theory and method (Butler, 2016). According to Butler and Senior (2007), OCN is the study of processes within the brain that are the basis or influence human decisions, behaviors, and interactions **a) within organizations or b) in response to organizational or institutional manifestations.**

The use of neuroscience methods allows researchers and practitioners to better understand organizational actors' behavior since it uses physiological indicators to analyze their neurological architecture (Waldman & Balthazard, 2016). Managerial decision-making is one of the organizational issues addressed by OCN. Studies about decision-making in economic, marketing, and organizational contexts demonstrate that OCN contributes to academics and practitioners to understand the biological mechanisms responsible for mediating choices in decision-making processes by decomposing the neural mechanisms related to these processes (Plassmann et al., 2008, Butler et al., 2016).

However, the use of neuroscience in organizational studies goes beyond simply applying brain technology to understand organizational phenomena. According to Butler et al. (2016), OCN is a **multidisciplinary approach**, which aims to contribute with methodology and theory. OCN concerns not only with the study of the brain but also the context involved and with the incorporation of this knowledge to organizational theory.

This study aims to provide a broader understanding of individual actors' role in the organizational adaptation to institutional logics. To achieve this goal, an analysis of both perspectives was carried out, gathering studies that support the proposal of a new research framework: a neuroinstitutional understanding of the role of individuals cognition in organizational action.

Organizations are always embedded in a constellation of logics (symbolic and material practices) that drive their actions, constraining, or enabling them. The managers are continually drawing actions to adapt to the environment created by those logics. Those actions, influenced and guided by cognition, involve macro, meso, micro and, individual levels that need to be analyzed together to broaden the understanding of organizational responses to institutional logics. Besides, according to Okhuysen and Bonardi (2011), management is full of phenomena that can often, be studied using more than one theoretical approach.

Studies have been realized to understand the influences of symbolic and material practices on individual action and cognition. Some research has been carried out to study the role of institutional logics driving attention and cognition in organizational adaptation (Ocasio, 1997; Thorton & Ocasio 1999; Thorton 2001; Thorton 2004; Greenwood & Suddaby 2006; Dunn & Jones, 2010; Nigam & Ocasio, 2010; Hulting & Mahring, 2014). However, it is necessary to further studies that focus on attention processes, and consequently, cognition from the perspective of micro-foundations of Institutional Logics. Although the understanding of the individual actor, his agency capacity and limited rationality appears in several studies (i.e., York et al. 2016; Bevort & Suddaby, 2016; Turner et al., 2016; Zao & Wry, 2016; Martin et al., 2017; Anderson & Liff, 2018; Friedland, 2018; Corbett et al., 2018; Kaiser et al., 2018; Gonçalves et al., 2019) the knowledge so far is limited to a combination between what is being said by the objects of analysis and the perspective of the researcher.

To deal with those limitations the present study discusses the approach and combination of two different perspectives of individual analysis and proposes an expanded framework that includes methods from neuroscience supported by the OCN perspective to open the organizational actor's "black box". The framework proposed presents the possibility of exploration by researchers: 1) a complete set of influences - symbolic, material, and biologic - that drives the individual role in organizational adaptation to logics; 2) a multilevel comprehension of the impact of institutional logics on organizational action and attention.

The model starts from the following assumptions: a) to comprehend micro, meso, and macro-level of analysis is primordial to consider the individual actor; b) once the environment drives individuals' cognition and, consequently, their actions is essential to consider also the biological functions behind these processes that are responsible for coordinating the individual thinking, and consequently, group interaction and organizational adaption to institutional logics.

Thus, This study aims to amplify the understanding of the role of individual actors in the organizational adaptation to institutional logics through the combination of different perspectives: OCN and Institutional Logics Perspective. Studying individuals more deeply under the institutional logics perspective elements and neuroscience methods through the OCN bring contributions for both perspectives.

Firstly, according to Thorton et al. (2013), the institutional theory claims for innovative methodologies and combinations of methods in order to develop new contributions based on different lenses of analysis for the same phenomena. Following Ragin (1994) conception of sociological research, which defines it as the construction of representations of social life from

the dialogue between ideas and evidence (theory and data) through quantitative and qualitative methods, combining the institutional theory with OCN enables deeper analysis and broader understanding of a phenomenon.

The combination of both perspectives allows the study of what is being said by individual actors during interaction and what is not being said (emotions, behavior, stress level, focus of attention, etc.) Putting together the premises of the institutional logics perspective with OCN is an advance in organization studies, mainly due to the fact that, on one hand, OCN claims for multilevel studies that combine the individual with the context they are embedded in multilevel approaches and, on the other hand, the institutional logics perspectives claims for new methods capable of capturing multiple nuances present in an organization (macro, meso, and micro levels).

To present the argument, I firstly present and discuss the path of the institutional theory from the first studies of Selznick to the most recent studies using the institutional logic pointing the evolution of the level of analysis. After I present the history of neuroscience outside medicine field and its rising in organizational studies based on the Organizational Cognitive Neuroscience, it will give subsidies for the reader to comprehend the developing of a Neuroinstitutional framework to understand organizational adaptation to institutional logics. Finally, I present the final considerations and suggestions for future research.

## 2.1 INSTITUTIONAL THEORY PATH: FROM MACRO TO INDIVIDUAL LEVEL

Institutional theory has been evolved since its first studies, starting with Selznick in the 1940s and 1950s decades until now. During this time, new ideas and elements of analysis have been introduced. The conception of how the environment influence is considered inside the institutional theory has been changed, and the importance of considering all level of analysis, including individual actor is gaining more and more relevance. The following subitems will present and discuss this evolution, its impact on research and the understanding of organizations.

However, before talking about institutional theory, it is important to remind some concepts and ideas about institutions, once it will be necessary further up.

Institutions can be defined as being permanent social initiatives constituted by determinations that create identities in collective behavior. Moreover, institutions occur

whenever there is a reciprocal “typification” of usual “actions” by types of “actors” (Berger & Luckman, 1991, p.79).

It is a human construction through a subjective interpretative process and not necessarily rational. The permanent characteristic of institutions is due not only its capacity to supply human necessities, which are culturally defined, but also due to a series of contingency factors arose from the inevitable relations between social and non-social phenomena (Hughes, 1937).

New institutionalism researchers adopted the concept that institutions are structures compatible and evaluative with the environment based on the continuity and perpetuation of standards. This happens because on institutions lies the personification of the choice of the rules that will drive to certain stability and segmentation of the society which, many times, are forced to adapt to it (Scott, 1987).

Besides that, Institutions can be understood as one of the components responsible for the existence and maintenance of social relations between organizational actors. Although its permanent character, frequently tensions between technology, politics, economics, etc., and institutions can be considered a strong factor that can induce change.

Sociological studies describe institutions as simplified units of long-lasting social behavior, thus corresponding to social phenomena. However, the first organizational studies based on this proposition presented a concept of institution with a more prescriptive character. They were concerned with how organizations could become an institution, that is, how these organizations could gain legitimacy before society by acquiring a permanent character and guaranteeing their survival in the business environment in which it operates.

The institutional environment plays a main role in the institutional theory once it establishes rules that organizations must follow, define existing situations, and determine new ones to specify its rational character (Meyer & Rowan, 1977). These rules arise from the sociocultural environment, which organizations are part of, and are passed through a cognitive process using a system of beliefs that are taken-for-granted by the organizations. It is then assumed that "reality is constructed by the human mind in social situations" (Scott, 1995, p.15) rather than conceived as a natural reality.

Institutions are socially constructed and constituted by the actors’ actions that, together with organizations, are submerged in an institutional network (Friedland & Alford, 1991). It can be considered as one of the components of manipulation and interaction of the environment. They can reduce the behavioral uncertainty restricting the uncertainty of the environment in which the institutions and an extensive range of actors are embedded. This reduction of

uncertainty occurs as institutions establish ways of orienting human action through moral or cognitive models that enable their understanding, interpretation, and/or action.

### 2.1.1 Old Institutionalism – Considering the role of society on organizational life

Between the decades of the 1940 and 1950, Selznick and Parson's early studies attempted to understand how institutions function to integrate organizations through universal rules, contracts, and authority (Thorton & Ocasio, 1999). The institutional theory considers that the environmental forces - cultural, political, social, and even symbolic - are more robust determinants for the understanding of organizations. Institutional theory, therefore, runs against the idea that structures are based on the bureaucratic rationalist spirit according to which organizations structure themselves, exclusively, for competition and efficiency.

Selznick (1949), based on Robert Merton and Chester Barnard's ideas, developed a model of a natural system called institutionalism. Through this model, he analyzed organizations as a structural expression of rational action that are frequently under pressure from social environment and became organic systems.

Selzinick (1957) did not put away the rational view that organizations are designed to achieve goals, although he noted that formal structures are unable to ignore the non-rational dimensions of organizational behavior since individuals do not act solely according to their formal roles, just as organizations do not act solely according to their formal structures.

According to the approach of the first studies of institutionalism, an organization constructs a structure of distinct character, in which the manifestations of values shared with the environment overlap with manifestations of a strictly rational and technical character.

The relationship between organizations and the environment becomes central to institutional theory, as it starts from the idea that organizations are part of the environment by transmitting and withdrawing appropriate ways of acting. Therefore, the institutional environment plays a significant role, as it imposes on organizations rules that will determine new situations and redefine existing ones to specify their rational character (Meyer & Rowan, 1992).

The organizational changing processes, according to Selznick, occurs in consonance with norms and rules that influence the organizations to reach their goals and purposes. During the construction of organizational functions and tasks in an organizational changing process, technical aspects are substituted by symbolic elements. Thus, organizations are considered as vehicles for the incorporation of values and not restricted to the rational character of rules and

regulations. The necessity of perpetuation leads organizations to gather efforts to realize a symbolic transformation in order to assume the status of an institution. Based on these ideas, institutional theory puts aside the premise that the phenomena that occur within an organization are a consequence of rational decisions based, exclusive, on technical information and assumption. For Selznick, organizations are instruments designed to achieve specific goals and, at the same time, adaptable living structures constantly changing goals and purposes. However, organizations are subjected to non-rational behavior dimensions (Selznick, 1949).

By stating that organizations are, over time turned into institutions, Selznick (1972) constructs an analytic distinction between organization and institution. For the author, the organization corresponds to a technical instrument to direct the human efforts towards a previously established objective. Organizational character is rational and perishable for a specific purpose. On the other hand, an institution comes from the needs and social pressures, being its appearance something natural and inevitable. An institution is characterized by the adaptability and assumes a specific character, independent of its purpose or services and products that it offers. For Selznick (1972), organizations are concerned with structure, processes, products, and services, whereas institutions go beyond the structure, reflecting a historical construction influenced by the social environment, although manifested by the same object.

Several studies were produced using the “old institutionalism” perspective. Nevertheless, a new perspective, called neo-institutionalism rose bringing the role of the institutional field where organizations are submerged, bringing more attention to organizations and introducing new concepts such as legitimacy, isomorphism, and the taken-for-granted character of organizations, which removes the rational capacity of individuals and organizations and its individualities.

### 2.1.2 New Institutionalism: eyes turn to organizations

In the 1970s, a new approach began to gain attention due to the studies of Meyer and Rowan (1977) and Zucker (1977). The studies started to include the role of culture and cognition in institutional analysis, organizational compliance with rules (macro perspective), and the role of cultural persistence as a measure of institutionalization (micro perspective). Both perspectives emphasizing the "taken-for-granted" nature of organizations - when rules are defined by the sociocultural environment in which organizations are embedded and are

transmitted through cognitive categories and belief systems that are taken by organizations to be true, which lead the organizations to isomorphism.

Selznick's old institutionalism emphasizes the macro institutional and constitutional structures, political systems, language, and legal systems, leaving organizations on the edge of institutional determination, given little attention to organizational level (SCOTT, 1995).

On the other hand, the neo-institutionalism theorists place greater emphasis on organizations as they recognize their importance as significant constituents of the social universe. Organizations are considered a union between individuals and social reality (Scott, 2005). DiMaggio and Powell (1983) established a division between old and new institutionalism. This division emerged as a segmented form of perception in which the old institutionalism is related to change while the new institutionalism represents permanence.

Approaching organizations' relations with their environment, the neo-institutional perspective suggests an organizational adaptation to the environmental norms. The organizational adaptation to norms and rules is because these norms and rules carry standard behaviors that lead to legitimac,y which ensures the social recognition of organizations, reducing the risk of uncertainties. In this perspective, the cognitive elements are highlighted; the interpretation of reality by organizations and individuals ensures greater or lesser adequacy to the levels of the organizational environment (Meyer & Rowan, 1977; DiMaggio & Powell, 1983; Scott, 1995).

According to Tolbert and Zucker (1999), institutional theory aims to elucidate the reasons for the emergence of an organization, how they become stable or are transformed, and how action and culture are structured in the organization. In this way, the process of institutionalization corresponds to how social obligations and processes become a rule. These processes occur less because of competition and more because of mimetic processes. The institutional theory advocates that organizational change is a process that becomes organizations more homogeneous but not necessarily, more efficient. The expectations disseminated by society and the pressures from the public sector and other institutions lead the organizations to adopt similar practices, resulting in an isomorphic process. These pressures can be coercive, persuasive or an invitation for organizations to unite their perceptions and actions. The set of these influential entities forms the organizational field (Meyer & Rowan, 1977; Zucker, 1977; DiMaggio & Powell, 1983; Scott, 1995).

The institutional environment had its definition expanded with the emergence of a new conceptualization proposal: organizational field. The extension of this concept, that is, the insertion of the organizational field as a definition for the institutional environment, can be

considered one of the most important contributions coming from the studies of institutional theory, and its understanding can be considered one of the keys to the institutional analysis (DiMaggio & Powell, 1983).

The organizational field corresponds to organizations that constitute a certain area of the institutional life constituted by suppliers, competitors, clients, and regulatory agencies. The organizations that constitute the field interact more frequently than actors outside it and share common systems and meanings. A structured organizational field will encompass a set of organizations that react to the environment to represent their relationships structurally while delimiting the actions built along this relationship. (DiMaggio & Powell, 1991).

Many studies demonstrated the relations between organizations and the environment, its pursuit for legitimacy, and isomorphic behaviors (Greenwood & Hinings, 1996; Oliver, 1997; Meyer, Scott & Deal, 1983; Tolbert, 1985.)

However, the role of the individual actors, the social interaction between them, and their capacity of agency was not considered. That gap started to be filled with studies that criticized the homogeneous characteristic of organizations highlighting the differences and individualities present among organizations in a field culminating in different responses to the environmental pressures (Goodrick & Salancik, 1996; Goodstein, 1994; Powell, 1991; Fligstein, 1997; Seo & Weed, 2002; DiMaggio, 1988; Colomy, 1988; Battilna et al., 2009). The recognizing of the individual actor and its agency capacity gained relevance with the institutional logics perspective studies.

### 2.1.3 Institutional Logics: the lenses focus the individual actor, agency and bring the society back

The definition of Institutional Logics emerged as an alternative to the predominant definitions that restricted the focus of Institutional Theory on the organizations' institutional pressures and their isomorphic behavior.

The previous ideas of the institutional logics perspective can be found in the authors' work of Social Sciences such as Bourdieu (1989); however, the study of Friedland and Alford (1991) brought a better understanding of this perspective. The authors conceptualized institutional logics as "the set of material practices and symbolic constructions" present in a field (Friedland & Alford, 1991, p.218).

These logics are related to the premises of organization of institutional arrangements and have a symbolic character. They are organizationally structured, politically defended,

technically and materially restricted, with specific historical limits. Institutional Logics are a broad set of principles that guide organizational perception of reality, define appropriate behavior, and how to succeed. Thus, these logics provide a guide to interpretation and operation in social situations and, can be mutually incompatible. (Thornton, 2004; Greenwood et al., 2011).

According to Thornton and Ocasio (2008), the approach of institutional logics, while being an alternative to traditional conceptions of institutional theory, carries some ideas in common with the foundations of neo-institutionalism of Meyer and Rowan (1977), Zucker (1997) and DiMaggio and Powell (1983): the concern with culture and cognition and how these factors influence organizational structures. However, there is a significant difference regarding the similarity of organizational structures and processes adopted. The institutional logics approach looks at the relationship between these logics, people, and organizations to understand variations in the environment rather than focusing on isomorphism and convergent change.

Society is constituted by multiple institutional logics that are independent and, sometimes also contradictory. Multiple institutional logics can be competing for a greater influence in the domains of society. Besides, these logics often are in conflict, which means that its systems of meaning and normative understanding built from rituals and practices foment conflicting expectations (Friedland & Alford, 1991; Nigam & Ocasio, 2010; Greenwood et al., 2011).

According to Friedland and Alford (1991), since organizational behavior cannot be interpreted without situating it in society, institutional logics go beyond the field boundaries. Same logics can be present in different fields and constitute the principle of organization field. The field is formed by a group of actors operating in the same domain, and their actions are guided by the same set of institutional logics, interdependent or competing, providing resources or constraining the actors' actions and goals.

The institutional logics which motivate behavior and cognition derive, in part, from external stimuli socially constructed. Therefore, to comprehend institutions' influence on individual cognition and behavior is necessary to understand how institutions shape interest independently of the individual or organization. This influence is called the externality of an organization (Friedland & Alford, 1991). The authors point out ideas of how to bring the societal contents to the individual and organization's behavior highlighting the basic assumptions for developing a theory of levels of institutions that connect internal mental cognitions to rituals and external social stimuli. This theory of institutions' levels is conceptualized through institutional orders - subsystems that form the institutions, which, in

turn, are composed of categories that form an interinstitutional system. These categories represent the cultural symbols and material practices particular to each order that will shape the individual and organizational interests and preferences and the behavior by which interests and preferences are achieved within the sphere of influence of a specific institutional order (Thorton, Ocasio, Lounsbury, 2013).

Once the reaction to institutional logics is interpreted by individuals and organizations, it must be considered the role of the agency, structure and interpretation as being inherent to logics.

Agency is the ability to intervene in situations, even if it is not intentional. According to Giddens (1984), acting goes beyond simply intending to do something, it is about being relevant in its occurrence once the action is related to the agents' ability to give something different for something that already exists. The agent's intentionality cannot be denied nor considered as being the main characteristic of the agency capacity. Although any action has as its starting point an intention, its result cannot be explained exclusively based on intention, but rather when unintended consequences are recognized. These ideas represent the notion of limited rationality once, although the institutional patterns constraint the rational ability of action, these same patterns enable the action (Giddens, 1984; Thorton & Ocasio, 1999).

To respond to the logics plurality, an interpretation must be considered, and it will be evidenced by the action and choice. The constructions of meanings and interpretations bring to institutionalization a dynamic characteristic. Even if a reproduction of socially acceptable patterns occurs, these patterns will not correspond to copies, since, even if the acceptance of patterns is intentional, they will be subject to diverse sources of interpretation and actions that will give meanings that agree with the context experienced by each institution. The assumptions of institutional theory are not only based on passivity, conformity or state of permanence but also capacity for reaction and change in organizations.

This conception of interpretation and agency can be transposed to the context of institutional logics as individuals and organizations are concentrated in an institutional network and must act following rules. The need for accordance with rules drives logics to take shape on both symbolic and action plans. The actors and even small groups can shape institutional logics. In addition, institutional logics support the behavior, values, identities, and interests of these actors characterizing what is conventionally called embedded agency (Greenwood & Suddaby, 2006; Thornton & Ocasio, 2008; Thornton, Ocasio & Lounsbury, 2012).

Considering the incorporation of agency to the context of institutional logics, Thorton, Ocasio, and Lounsbury (2013) proposed an integrative model of micro foundations of

institutional logics: A Model of Human Behavior derived from the rational choice theory and structural determinism borrowed from psychology and sociology. The proposed model views social actors as individuals embodied in political, social, and cultural structures and guided by cognitively limited identities and goals.

To explain the objectives, structure,s and identities that shape human behavior, the proposed model incorporates not only agency, limited intentionality, and a more complete and realistic view of the social situation, but also a central principle of social psychology: situationism. Situationism concerns the characteristics of immediate situations about individual behavior in time and space. These situations encompass both immediate social contexts and interactions as well as the material properties of situations.

### 2.1.3.1 Microfoundations of Institutional Logics

In the model proposed by Thorton, Ocasio and Lounsbury (2013, p.85), called the Cross-level Model of Institutional Logics, they demonstrate the interrelationships between macro and micro levels of analysis. Embedded agency and institutional contradictions are the roots of microfoundations of the institutional logics perspective. However, other concepts related to human behavior are also considered in the model of microfoundations. In this model, represented in figure 1, institutional logics focus the attention of individual or group actors through cultural incorporation, activating the identities, objectives and action plans of a social actor.

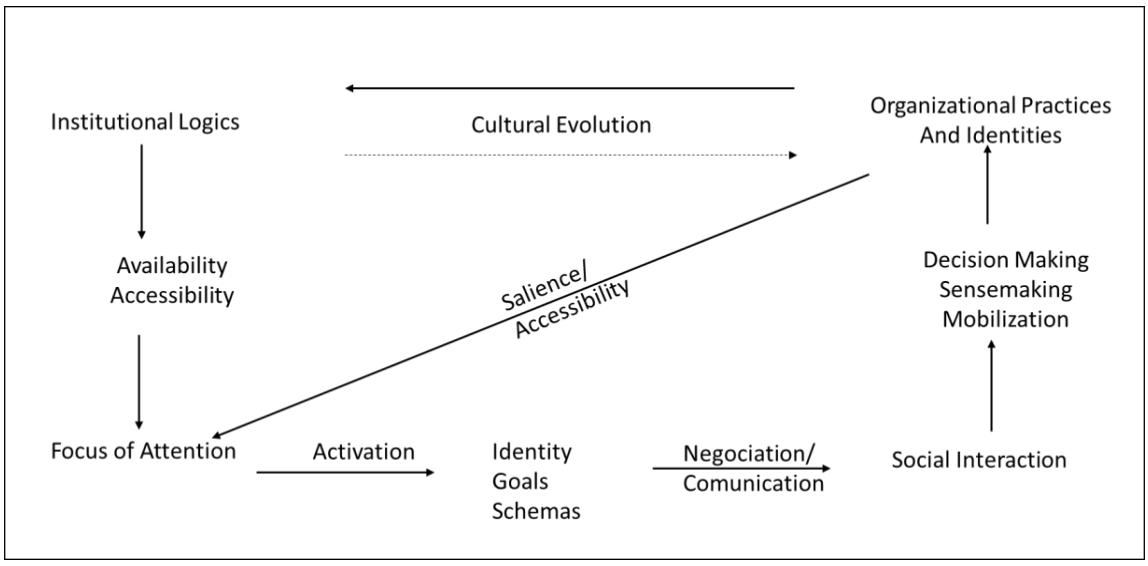


*Figure 1*: A Cross-Level Model of Institutional Logics Combining Macro-Micro and Micro-Macro. Adapted from Thorton, Ocasio and Lounsbury (2013, p.85)

The model presented in figure 1 demonstrates a notable presence of agency incorporation and human behavior in the interpretation, agency and, even change and evolution of Institutional Logics.

Embedded behavior implies in the individual's agency, still it is being subject to limitations. The individual agency allows the search for the satisfaction of individual needs and self-interest. But not just this. Social identities and identification also guide the individual agency. Their social identification is derived from a perception of unity allied to a category of people. Individuals have multiple social identities, including the organization of which they are part, their workgroup, professional field, political party, age group, and ethnicity. Social identities, in turn, are defined both in terms of group or category of members (Psychological Social Identity Theory) and in terms of identification with particular social roles (Sociological Identity Theory). Both forms of social identity are relevant to the micro-foundations of Institutional Logics. Categories of relevant identities embrace social actors in industry, occupations or professions, employers, departments, affiliations of voluntary organizations, race, gender, ethnicity, nationality and geographical location. Role identities are defined through a social actor's relationships with other social actors: CEO, investors, managers, leaders, and volunteers (Thorton, Ocasio & Lounsbury, 2013).

In this way, individuals have multiple identities and roles which are not equally available or accessible to social actors. However, the sociological perspective on identity highlights identity verification and commitment to make some of them more accessible and likely to be activated throughout the situations. This verification of identity corresponds to "attempts by social actors to validate their social identities through symbolic exchanges with other social actors throughout various situational contexts" (Thorton, Ocasio & Lounsbury, p. 86, 2013).

Individuals and organizations not only have multiple identities but also goals that are often disagreeing, and will guide cognition and action in various situations and domains. Often, conflicts between goals remain unresolved, and will be activated by the processes of attention. According to the Institutional Logics perspective, goals and social identities are culturally incorporated within alternative institutional logics affecting individual cognition and action. Often goals are not congruent with individual's identities. Institutional logics help social actors construct structures or schemas aiming to shape attention, interpretation, inference and problem solving (Thornton, Ocasio & Lounsbury, 2013).

However, individuals have limitations concerning their ability to allocate cognitive resources for information processing (attention) to any environmental stimulus and response to actions. Organizations develop structures and processes intending to shape the focus of individual or group attention. Allocation, or the focus of attention, is guided by the institutional logics that shape the problems and issues that must be addressed and the possible solutions to these issues, limiting action and cognition of the individual directly related to decision-making processes (Ocasio, 2011; Thornton, Ocasio & Lounsbury, 2013).

Studies considering cognitive resources have been carried out (Thorton & Ocasio, 1999; Lounsbury, 2007; Thorton, Jones & Kury, 2005; and Cho & Hambrik, 2006); however, those studies most emphasizing the role of institutional logics and organizations in a top-down process. Research concerned with bottom-up environmental stimuli considers that not always individual and organizations will face situations where existing schemas agree with behaviors and outcomes observed in the environment. In some situations, the bottom-up stimuli will not always be attended to. Rather, it is contingent on the salience of the stimulus.

Ocasio (2011) discusses the need for more studies that demonstrate the interrelationship between these two processes, since most of the research focuses on the institutions and organization guiding attention: top-down processes. However, research has also shown that attention, and consequently, action is guided by objectives, task demands, and prior cognitive orientations that lead to automatic responses suggesting the importance of the bottom-up process. The author also talks about the importance of research that addresses a multilevel analysis that demonstrates the relationships between individual cognition and organizational attention. The importance of understanding human cognition in the organizational adaptation processes to institutional logics opens a door for the use of an innovative approach: the organizational cognitive neuroscience.

## 2.2 NEUROSCIENCE AND ORGANIZATIONAL STUDIES

### 2.2.1 Neuroscience: from Medicine to Organizational Studies Field

A better understanding of organizational phenomena, its processes, and the management of these processes has been the subject of both research and organizational practice for decades. The puzzle involving the functioning of managers' thinking began to be unraveled about 30 years ago through cognitive neuroscience. Cognitive neuroscience studies the functioning of human thought and its relation to biological functions. As a discipline, it

attempts to explain how the physical and biological parts of the brain influence or create less tangible phenomena such as thoughts, emotions, behaviors, and memories (Waldman & Balthazard, 2017).

Organizational neuroscience is a recent field that is still evolving. Despite this, Ward et al (2017) draw attention to the variety of concepts that exist to define this field. Some of those definitions are:

a) Butler and Senior (2007) - the study of processes within the brain that are the basis or that influence human decisions, behaviors, and interactions a) within organizations or b) in response to organizational manifestations or institutions.

b) Beugré (2010, p. 289): “study of the impact of brain structures on human behavior in organizations.”

c) Becker e Copranzano (2010, p. 1055): “a deliberate and judicious approach to bridge the divide between neuroscience and organizational Science.”

The definitions have three elements in common that are highlighted by Ward et al (2016): (i) use of the brain as a unit of analysis; (ii) use of the organization as a level of analysis; (iii) presence of interaction between the brain and organizational phenomena. For the authors, the definition of Becker and Cropanzano (2010) is the most comprehensive and adequate, mostly due to the use of the words "deliberate" and "judicious" highlighting the idea of the importance of planning and caution in conducting research that deals with organizational neuroscience. However, this research will adopt the definition of Butler and Senior (2007) once it fits better with the study proposal but also considering the needs of deliberation and prudence mentioned by Becker and Cropanzano (2010) in conducting the research.

Organizational phenomena are complex in nature. Organizations are highly complex environments within even more complex environments (e.g., social contexts). Many of our most important decisions are taken in contexts of social interactions. The brain engages in specific action only if it has a subconscious evaluation that there is a positive return for an action within a given context. That is, you cannot lead a group if individuals’ brains decide not to follow the leader. In general, organizational neuroscience and the study of several underlying neural systems are relevant to social interactions in organizational contexts (Waldman & Balthzard, 2016).

The pioneering organizational neuroscience publications focused on clarifying the paradigm underlying organizational neuroscience and proposing a definition. Simplifying, the organizational neuroscience paradigm holds that we must include information about the brain to build a complete understanding of organizational phenomena. These earlier studies sought

to defend the potential benefits of organizational neuroscience that, according to Ward et al. (2016) are:

d) Neuroscience provides a broad range of tools that enable data collection for measuring brain activity by providing an additional level of measurement. Using these tools, one can obtain information that an employee would not be able to report consciously;

e) It may be used as a complement to traditional methods of analysis;

f) It may enhance our understanding of constructs and their relationships, strengthening construct validation efforts;

g) It provides new possibilities for refining theories, and build new approaches addressed to important issues.

Despite researchers' growing interest in organizational neuroscience, some caution must be taken before undertaking such a study. Powell (p. 1495, 2011) established four questions that must be addressed by the researcher to examine the potential contribution of research to strategic management and which can be transposed to research in organizational studies:

a) Is this a central problem for the studies and practice of organizational management?

b) Can it bring new questions to neuroscientists?

c) Is it an issue that has been neglected by other fields?

d) Will neural evidence increase our understanding and, if so, how (through validation of constructions, theoretical analysis or practice of information strategy)?

Reactions to early work on organizational neuroscience varied between inspiration and enthusiasm and criticism and confusion. Scholars have described organizational neuroscience as a potential missed opportunity. If scholars and organizational practitioners ignore the information and tools of neuroscience, they are taking the risk of becoming obsolete compared to areas such as cognitive, social neuroscience, which is gaining influence. Thus, to keep the science of organizations healthy, we must strengthen our research efforts by appropriately incorporating the tools and knowledge of neuroscience in management and organizational research.

### 2.2.2 Organizational Cognitive Neuroscience

The term organizational cognitive neuroscience (OCN) originates from the quest for coherence in the attempts to unite cognitive neuroscience methods to explain organizational

phenomena (Butler, 2016). Butler and Senior (2007) define OCN as being the study of processes within the brain that are the basis or that influence human decision, behaviors, and interactions a) within organizations or b) in response to organizational manifestations or institutions.

Later, Senior and Butler (2011, p.805) pointed out that earlier definitions of OCN as "the study of the processes within the brain that underlie or influence human decisions, behaviors, and interactions either (a) within organizations or (b) in response to organizational manifestation or institutions" are incomplete, since the focus of this definition is restricted to the brain. A complete definition of OCN would also consider the interaction between brain systems and cognitive mechanisms mediating the human behavior responses to organizational manifestation and institutions.

The definition of OCN is based on social cognitive neuroscience, because the former may be an applied form of the later. More than a simple application of neuroscience methods in organizational studies, OCN is a multidisciplinary approach in terms of method and theory. It concerns the study of the functioning of the brain within organizations and the incorporation of concepts and prior knowledge of the functioning of the brain system in the development of propositions about organizational phenomena (Butler, 2016).

Improving the OCN definition by making it more complete is important because it shows that organizational cognitive neuroscience is not only the study of brain systems themselves but also the incorporation and use of prior knowledge of brain systems to develop new hypotheses about relevant organizational issues. Thus, it provides a broader scope by highlighting the interdisciplinary nature of organizational cognitive neuroscience, since research in this area can contribute to both organizational and cognitive neuroscientific knowledge (Senior & Butler, 2011).

One important point discussed by OCN is the importance of considering the context to achieve effective use of neuroscience to understand the organizational phenomenon. Converging to this idea, Ashkanasy et al. (2014) highlight the importance of the context in studies of the brain, once it represents a new perspective about one of the eldest controversies in organizational behavior: the interplay between the individual and the context. Although recent studies (Hanna et al., 2013; Waldman & Balthazard, 2015; Friedman et al, 2015; Waldman et al, 2017) have demonstrated the implications and direct relevance of cognitive neuroscience for current theories and models of organizational situations, these approaches remove the context of their research inquiries. By doing so, researchers risk studying brain activities and neurological responses that are different from those which consider context and

the situations present in the real life of individuals and organizations. Brain activities cannot be accounted for as basic building blocks, nor be studied in isolation from its context (Senior & Butler, 2011).

As well as it is not advisable to conduct top-down organizational research without considering the existence of cognitive and neural systems of groups and individuals, it is also difficult to conduct bottom-up research considering only brain activity and neurological responses without considering the role of the social context in which individual, groups and organizations are part of. Thus, according to Senior and Butler (2011, p.806) "where there are competing theories of the same organizational phenomena, the organizational cognitive neuroscience approach may be able to provide more convincing evidence to determine which one is the more accurate explanation". Just as organizational research that is informed by top-down and bottom-up perspectives can deepen our understanding of organizational research problems, the same might be said of using approaches that consider the underlying brain systems and cognition.

Although the field of OCN has evolved, especially in economics, marketing and organizational behavior, Butler et al. (2016) discuss the importance of more empirical research to consolidate the field. There are varieties of topics being addressed in OCN that claim for more research that enrich the body of knowledge. Management and organizational studies offer a vast field of research to develop the use of neuroscience to understand organizational phenomena.

The authors also claim for the use of more varied neuroscientific methods. Research in economics and marketing use mostly hormone levels (Zyphur et al., 2009; Saad & Vongas, 2009; Apicella et al. 2008; Coates et al., 2009) or neuroimaging techniques (Boyatzis et al., 2012; Krueger et al., 2009). Research in organizations offers a more extensive variety of methods, including qEEG (Balthazard et al., 2012; Hanna et al., 2013; Minas et al., 2014; Peterson et al., 2008; Waldman et al., 2011), facial morphology (Spisak et al., 2012; Wong et al., 2011), and fluctuating asymmetry – the extension of asymmetry between right and left side of the body – (Senior et al., 2012). However, more research is needed to give coherence to OCN studies.

## 2.3 THE NEUROINSTITUTIONAL PERSPECTIVE: A MORE IN-DEPTH AND MULTILEVEL APPROACH FROM INDIVIDUAL TO SOCIETY AND BACK

### 2.3.1 Gaps and limitations of both perspectives

Both approaches can be benefited by a combination of perspectives, once some gaps and limitations can be filled by bridging institutional theory and OCN. Next, we discuss some of those limits and how they can be transposed by a combination of approaches.

#### 2.3.1.1 What can still be improved in institutional theory?

As mentioned above, institutional theory has been evolving all over the years from a perspective called old institutionalism to the most contemporary, institutional logics perspective. During its path, new nuances started to be considered and analyzed in studies that adopted such perspective. Although derived from neoinstitutional theory, the institutional logics perspective brought new features until not considered, such as the joining and theorizing the duality of the material-practice-based present in DiMaggio and Powell (1983) study and the cultural-symbolic-based aspects of institutions, from Meyer and Rowan (1977).

Institutional logics perspective came to fill the neoinstitutionalism limitation that considered the homogeneous aspects of organizations submitted to environmental pressures disregarding the heterogeneity and agency capacity of the organization and the individual actor, who gain more space and a spotlight in this new perspective.

When we adopt the institutional logic perspective, we assume that the social actor is the master key to understand the effects of a constellation of logics in organizational behavior. According to Friedland and Alford (1991), who brought to the surface of the institutional theory the importance of the social actor and the capacity of agency, there is an interplay between the three levels: society, organization and individuals that must be considered in studies that adopted institutional logics perspective. These levels, although autonomous, are interdependent and in this set of levels, individuals are continually competing and negotiating, organizations are in conflict and coordination and institutions in contradiction and independency (Friedland & Alford, 1991). Human behavior is the pillar that holds the Cross-Level Model of Institutional Logics proposed by Thorton et al (2013). The multilevel characteristic of this model brings the individual as a critical element to understand how the wheel of macro and micro level spins.

However, before talking about how to understand individual and group behavior and, consequently, organizational behavior, it is necessary to remind that organizations are highly complex social environments embedded in different social contexts. Therefore, many of our

most important decisions are made in contexts of social interactions. Thus, a brain will only engage in particular action if it has a subconscious evaluation that there will be a positive return to its action within a given context. In general, organizational neuroscience is the study of several underlying neural systems relevant to social interactions in organizational contexts (Waldman & Balthazard, 2016). Hanna *et al* (2013, p.406) suggest that the growing interest in management and organizational studies using biological methods can be named as a cognitive revolution that culminates in a methodological revolution.

The perspective proposed by Thorton, Ocasio and Lounsbury (2013) reveals the importance of the interconnection between micro, meso and macro-level of analysis integrating the core conceptions of institutional theory e highlighting the importance of organizational ad actor's cognition. The role of the individual actor is so present in this perspective that the authors included in their cross-level model detailed constructs directly related to it: focus of attention, social identities, social interaction, decision-making, and sensemaking.

The focus of attention is the construct choose by Thorton, Ocasio and Lounsbury to explain the influence of institutional logics on organizational and individual actors' cognition which also influences negotiation, communication and decision making. Also, the focus of attention will trigger individual's emotion and behavior that influence cognition and action as well.

Ocasio (1997), recognizing the importance of understanding how organizations structure the individual focus of attention and how attention influences organizational adaptation to external and internal influences, proposed what he calls an Attention-Based View (ABV) focuses on how the attention in organizations shapes organizational adaptation. According to ABV, attention is defined as "the noticing, encoding, interpreting, and focusing of time and effort by organizational decision-makers on both (a) issues: the available repertoire of categories for making sense of the environment and (b) answers: the available repertoire of action alternatives" (Ocasio 1997, p.189).

Thorton, Ocasio and Lounsbury incorporate Ocasio's definition of attention to explain the focus of attention in the institutional logics perspective. Thorton, Ocasio, and Lounsbury (2013) consider the focus of attention as one of the microfoundations of institutional logics because it is directly related to the interpretation and responses to pressures arising from multiple logics in the environment. The authors point out that a greater concern with the focus of attention is necessary since the logics not only restrict, but also expand it.

The focus of attention is the result of a combination of top-down (driven by goals and schema) and bottom-up (driven by environment stimuli) attention. Institutional logics and

organizational practices provide structures to guide an individual's and group's focus of attention in a top-down process, while the prominent features of the environment and situations drive bottom-up attention.

Little research has been done so far, most emphasizing the role of institutional logics and organizations in a top-down process as in Thorton and Ocasio (1999), Lounsbury (2007), Thorton, Jones and Kury (2005), and Cho and Hambrik (2006). Research concerned with bottom-up environmental stimuli accounts that not always individuals and organizations will face situations where existing schemas agree with behaviors and outcomes observed in the environment. In some situations, the bottom-up stimuli will not always be attended to. Rather, it is contingent on the salience of the stimulus.

Ocasio (2011) discusses the need for more studies that demonstrate the interrelationship between these two processes, since most of the research focuses on the institutions and organization guiding attention: top-down processes. However, research has also shown that attention is guided by objectives, task demands, and prior cognitive orientations that lead to automatic responses suggesting the importance of the bottom-up process of attention. Also, the author talks about the importance of research that addresses a multilevel analysis that demonstrates the relationships between individual and organizational attention.

Other studies that used the institutional logics perspective addressed problems that include the effect of logics on the organizational and the individual actor. For instance, Greve and Zhang (2017) studied the influences of old state socialism logic on merger and acquisition decision-making process. Toytari et al (2017) adopted a micro perspective considering the role of individual managers on pricing process under institutional pressures such as socially prescribed norms, rationalized meanings and beliefs. Corbett et al (2018) shed light on the role of individual agency on the environmental performance of an organization and its corporate sustainability. There are several more studies analyzing how institutional logics influence and moderates organizational decision-making (Delmestri & Greenwood, 2016; Shipilov et al, 2010; Greenwood et al, 2010).

According to Durand and Thorton (2018; p.632) one of the fundamental questions of institutional logics perspective is why and how individual and organizational actors maintain or upend preexisting logics". And once institutional logics is a framework used to analyze the interrelationships between individuals, organizations and institutions, it is important to consider a necessity of a deeper understanding of individual behavior and cognition. But is there still room for more improvement?

According to Okhuysen and Bonardi (2011), organizations are permeated by an extensive range of phenomena that can, often be studied using more than one theoretical approach. The authors highlight the fact that multiple-lens explanations provide different and, sometimes, contradictory views, increasing the management field which claims for studies and research that matters, that are relevant to our field and that reflect the reality of management once the managerial decisions in private and public organizations affect millions of people in the world.

Aligned with Okhuysen and Bonardi's view, Thorton et al (2013) point out that one of the features that contribute to the strength of the foundational studies of the institutional logics is the triangulation of data and methods, qualitative and quantitative. Empirical studies that use institutional logics perspective has been demonstrated the possibility of using a variety of methods – quantitative and qualitative - to understand phenomena: case studies, survey, ethnography, discourse analysis, statistical modelling techniques and so on. Even with the use of a large range of methods, Thorton et al. (2013) advocate that institutional logics studies would be improved if experiments and simulations were applied. According to them, the interinstitutional system typology combined with the cross-level effects model form an innovation that demands attention to the choice of methods discovery and validation. A cross-level analysis claims for multimethod approaches and the collaboration among scholars from different fields. Thus, it is possible to say that new and innovative methods, which would able to understand individual actors deeply, could broaden the spectrum of analysis and amplified the understanding of the influence of logics on organizations and individuals and vice versa.

That said, it is possible to say that the institutional logics research would benefit from combining the methods already used on empirical research with the OCN perspective.

Cognitive effects are relevant to understand how individuals and organizations respond to the influence of logics and how they influence it back. As already explained, organizations face ambiguity and cognitive limitations that impact executive decision-making, limiting their capacity to respond and adapt to all determinants of their environment. Thus, a decision will never achieve perfectly and completely its goals (March & Olsen 1979; Simon, 2013). This limitation is also related to the fact that individuals have restrictions concerning their ability to allocate cognitive resources for information processing (attention) to any environmental stimulus and response to actions. Thus, they are constrained to focus their attention and cognition on a limited set of issues (Ocasio, 1997).

#### 2.3.1.2 Filling OCN with a robust organizational theory

The managerial decision-making is connected with the way organizations adapt to the environment and is one of the organizational issues addressed by the OCN. Research studying decision-making within economic, marketing and organizational contexts shows that OCN will contribute to building models that predict decision and choices in a better way. Besides the focus of attention, there are several biological phenomena that are connected with cognition that can be studied under OCN lenses such as behavior, language, emotion and social interaction. Despite the short life of this field of study, OCN has given essential contributions once it reveals the nature of human sociability in organizational contexts and with its development it will be possible to compensate the limits of our focus of attention, influencing how we work (Butler et al, 2016).

The use of neuroscience in organizational studies goes beyond to applying brain technology to understand organizational phenomena. According to Butler et al (2016) OCN is a multidisciplinary approach that aims to contribute with methodology and theory in all levels. OCN concerns not only with the study of the brain but also with the incorporation of this knowledge to organizational theory. Besides, this perspective is concerned not only to understand the individual applying neuroscientific methods. More than that, one of its goals is to use those information to understand the connections existent between the human being, the organization and the social context. Given that, adopting the OCN assumptions in this study is appropriated due to the multilevel character of the institutional logics perspective.

Butler (2017) suggests that there is a focus on studies that try to understand the relations between what happens inside the manager's brain and their effectiveness and behavior. According to a systematic review of studies using OCN (Butler et al. 2015), the recent research shows that OCN is emerging as a new resource for understanding and development of managers and organization.

Once it is a new field, OCN needs further empirical research searching for filling the gaps of methodological and conceptual limitations (Healey & Hodgkinson, 2014). Although the short life of the field, the contributions of OCN for a better understanding of the nature of human sociability in organizational contexts is recognized, and it will help to develop models to predict decisions (Saad & Vongas, 2009; Butler, 2016). Thus, this framework aims to provide theoretical and methodological contributions to the organizational studies.

### 2.3.2 The Neuroinstitutional Perspective

The use of method triangulation and a multimethod approach has been increasing in social sciences. Throughout the 20th century, discussions about methods used to consider qualitative and quantitative approaches as being antagonistic. However, new studies have been showing a decreasing in this dichotomy and a crescent use of multimethod and adoption of more than one lenses to understand the same phenomena. Unfortunately, the use of multimethod still not appears frequently in studies that used the institutional theory framework[1] (Grodal & O'Mahony, 2017; Battilana & Casciaro, 2013; Alsahrari, 2020; Ertuna et al, 2019; Modell et al, 2017; Ozdil & Hoque, 2017; Alshary & Hoda, 2017; Willem & Coopan, 2016; Kline & Dolamore, 2019). Most of studies are in accounting and the methods used do not present an expressive variety – interviews, surveys, observation and secondary data. Maybe, that lack of expressivity of studies that combine methods and/or frameworks is due to the challenges and the sinuous road that the research must face.

Durand and Thorton (2018) encourage researches to integrate institutional logics perspective and categories research. According to them, the organizational field can benefit when studies combine perspectives that have similar objectives to answer their research questions better. Gaps and limitations from one perspective can be filled when using the strengths of the other.

According to with what was being explained by now in the pages above, it is possible to affirm that there are reasons and challenges in approaching the institutional logics perspective and OCN.

Both perspectives share a common focus: the role of the individual in organizational life. The core of institutional logics perspective is the bounded rationality and the focus of attention, both directly related to cognition and decision making (Thorton et al, 2013; Ocasio, 1997). As seemed above, institutions are socially constructed and **constituted by the actors' actions** that, together with organizations, are submerged in an institutional network (Friedland & Alford, 1991). Institutions are, according to the authors, components of manipulation, and interaction of the environment. The behavioral uncertainty is reduced by institutions restricting

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[1] Note 1 – According a research made on 9th of July 2020 on Web fo Science and Scopus – Elsevier. The research used the following strings: "Institutional Theory" and "Multimethod"; "Institutional Theory" and "Triangulation". Period: 2010 to 2020

the environmental uncertainty of the environment in which organizations and a large range of actors are embedded. This reduction of uncertainty occurs as institutions establish ways of orienting **human action through moral or cognitive models that enable their understanding, interpretation and / or action.**

In the cross-level model, one of the discussions present in the institutional logics perspective is the individual agency, their role in the organizational adaptation to material and symbolic influences and one of the pillars responsible for that is the individual cognitive capacity which will drive decision making, negotiation, sensemaking and social interaction. Organizational cognitive neuroscience advocates that neuroscience provides a broad range of tools that provide an additional measurement level: what happens inside the black box of the individual actor. Moreover, going beyond that, this perspective is a multidisciplinary approach in terms of method and theory.

In order to develop propositions about organizational phenomena, OCN needs to walk side by side with organizational studies and theories that can assure that it will not become a mere applying of neuroscience methods – which is far away from OCN goals.

It is known that studies that use a decision-making perspective enable the researcher to examine and understand actions and behaviors that will culminate in consequences during the social interaction that will directly impact the organizational decision (Thorton et al, 2013). The articles using the institutional logics appearing in top journals every year have applied methods that consider only what is being said by managers and interpreted by researchers. But, once we have tools to go beyond that and understand what is not being said but, instead, shown by our brain, why not use it? Why not ensure that what is being said is following what is really happening inside managers' minds and being shown by their body functions commanded by the brain? Institutional logics and OCN converge on the idea of the importance of considering individual cognitive aspects and their consequences to organizational and societal levels.

Butler (2017) argues that there is a lack in the debates about OCN research: the implication for practice. Besides that, Thorton et al (2013) affirm that

> Like building any enterprise, by researching as multiskilled team, the research process and product is likely to be richer and provide a more nuanced understanding of how institutional logics mechanisms operate across levels. (Thorton et al, 2013, p.185)

Developing a Neuroinstitutional understanding of organizational adaptation bridging social and biological issues, this research will intend to provide a new resource for organizations comprehend the influence of symbolic and material practices and their responses to the adaptation to the environment, fostering and contributing to this debate, decreasing the distance between the OCN studies and its real implication for organizations and academic development.

### 2.3.3 Challenges and limitations of a Neuroinstitutional approach

I am aware that putting the institutional logics and OCN side by side is not an easy task. Researchers that decide on this endeavor must be careful with some key aspects. It is important to acknowledge that ontological, epistemological, ethical and costs must be taken into account.

One of the critics of using neuroscience on organization research is the risk of reductionism, once leadership, decision-making and others organizational phenomena are too complex to be reduced to neurons or individual's region of the brain and that an individual brain cannot feel, think or interact without stimuli or without being in the presence of other individuals (Lindebaum & Jordan, 2014; Lidenbaum & Zundel, 2013). However, authors who advocate using cognitive neuroscience to understand organizational phenomena clarified that it is necessary to consider all levels of an organization and the context where they are embedded. The interaction between individuals is also essential for organizational studies to benefit from organizational cognitive neuroscience (Waldman & Balthzard, 2015; Butler, 2018), which means that the use of neuroscience methods must be accompanied by other methods more familiar with the social sciences.

Positioning a research that brings the use of neuroscience to organizational studies requires caution, especially by the union of natural science with a social because of adoption of a posture in which social reality is not given in a concrete form, but instead constructed since a subjective and intersubjective experience of individuals.

To avoid pitfalls and epistemological mistakes, researchers can use critical realism assumptions to support the discussion. Critical realism lies in the space between objectivism and (radical) social constructivism. Its defining feature is the insistence on independent material reality, but also a negation of direct correspondence between knowledge about material reality and reality itself (Bhaskar, 2013; Healey & Hodginknson, 2014). A relevant feature of critical realism is that it provides a common epistemological basis for physical and social sciences, maintaining a unique ontology for transitive social sciences objects of study. The

metatheoretical status of critical realism provides explanatory mechanisms common to all sciences, thus providing an ideal pathway for connecting neuroscience to organizational studies.

Understanding organizational phenomena through a focus on individuals' brains and neurons may raise ethical questions as well. As with all techniques used to study human behavior, neuroscientific methods must be used with caution following protocols and procedures. Ethical university committees must always be involved assuring that all ethical and legal issues are not being violated. According to Waldman and Balthzard (2015), researchers must be compromised to inform all participants of the entire and detailed procedures that will be applied, what cognitive and behavior changes can occur during the data collection, and that all neural data will remain confidential.

Ethical concerns lead to another challenge: organizational access. Convincing employers and employees to accept be part of a study that will use neuroscientific methods can be difficult. At the same time, managers have been willing and interested in being part of this type of research. In my attempts to find an organization for a research using electroencephalography, all managers showed interest in being part of the study. The same happened in the attempts of using video-recording to analyze emotions via facial expressions. To transpose that obstacle, researchers can offer assurances of confidentiality, risks descriptions, and how to control it. But even so, it is important that researchers, organizations, practitioners and institutions work in cooperation during the entire study.

Contrary to other methods already used in organizational studies, another challenge to OCN's approach to organizational studies is the cost. Such studies may need collaboration between academic departments once organizational studies departments and business schools may not have researchers trained in neuroscience and/or the equipment necessary for data collection. Waldman and Balthzard (2015) suggest that researchers may need to present their projects to funding institutions, share the costs between universities or departments, and so on.

Even with several ontological, ethical and practical challenges and limitations, the possibility of the contribution of neuroscience to respond to complex research questions and build new frameworks and theories worth the endeavor to win the obstacles.

## 2.4 CONCLUSION

This article aims to amplify the understanding of the role of individual actors in the organizational adaptation to institutional logics. To do this, I propose here an effort in theory

building to motivate other researchers to integrate the institutional logics perspective with organizational cognitive neuroscience. Both perspectives have gaps and limitations that can be filled with the approach of these fields. Putting institutional logics and organizational cognitive neuroscience can expand our knowledge about how material and symbolic practices influence cognition. This expansion can be achieved through a combination of methods already used in institutional theory studies – including the interpretative ones – with neuroscientific methods with the support of OCN.

The argument was built based on Okhusen and Bonardi (2011), who considers that management is full of complex phenomena that can, often, be studied under more than one theoretical approach. It is already know that cognition influences individual and organizational action and it has been focus of interest of many areas, including institutional logics perspective and OCN. A multimethod approach and the combination of these perspectives can produce a complex analysis contributing to a broader understanding of individual and organizational responses to institutional logics.

Once OCN is a new field, it is necessary more further empirical research searching for filling the gaps of methodological and conceptual limitations (Healey & Hodgkinson, 2014). Although the short life of the field, the contributions of OCN for a more comprehensive understanding of the nature of human sociability in organizational contexts is recognized and will help develop models to help decisions (Saad & Vongas, 2009; Butler, 2016). The institutional logics perspective is a suitable base for this endeavor once it shares common interests with OCN: understand the individual and organizational cognition under a constellation of logics, the role of cognition during social interaction and how it shapes organizational decision and action, and even, institutional change.

It is important to remind that there are some circumstances that must be taken into account and some reflections that must be made. Researchers must be aware of the particularities of working with so different, and yet, complementary fields. Ontological and epistemological questions will always arise when a scholar decides to engage in a multimethod study. A possible solution, that will be more deeply discussed further, is the use of the critical realism assumptions. This perspective read a common ground for the physical and social sciences retaining a unique ontology to the transitive objects present in social sciences (Bhaskar 2013; Archer, 1995). The metatheory status of critical realism provides explanatory mechanisms that are common to all sciences providing an ideal way for the link between neuroscience and organizational studies and enhancing ontological discussions about using this perspective to understand organizational phenomena.

Another concern that researchers must be taken into account is the fine line between real contributions of the use of OCN and the simple use of neuroscience in organizational studies only to follow a fashion. As mentioned previously, scholars can use the questions proposed by Powell, 2011) to guarantee that the study is relevant, and will really contribute to the organizational field.

As mentioned above, this proposal seeks to add the micro aspects of institutions – e.g.: cognition, attention, emotion, behavior, social interaction – in a novel way that could help the development of a more holistic view about the dynamics of organizational life. Even with a large range of challenges, institutional logics perspective is a fast-growing stream of research (Durand & Thorton, 2018) and linking it with OCN can bring mutual enrichment revealing nuances unobserved and new sources of explanation to social and organizational phenomena in all levels, including what happens inside the managers "black box". We can go further once, according to Okhuysen and Bonardi (2011), multiple-lens explanations provide different and, sometimes, contradictory views of a same phenomena, increasing the organizational field which claims for studies and researches that matters, that are relevant to our field and that really reflect the reality of management once managerial decisions in private and public organizations affect millions of people around the world.

## REFERÊNCIAS

Alsharari, N. M., & Abougamos, H. (2017). The processes of accounting changes as emerging from public and fiscal reforms. *Asian Review of Accounting*.

Alsharari, N. M. (2020). Accounting changes and beyond budgeting principles (BBP) in the public sector Institutional Isomorphism. *International Journal of Public Sector Management*.

Andersson, T., & Liff, R. (2018). Co-optation as a response to competing institutional logics: Professionals and managers in healthcare. *Journal of Professions and Organization*, *5*(2), 71-87.

Apicella, C. L., Dreber, A., Campbell, B., Gray, P. B., Hoffman, M., & Little, A. C. (2008). Testosterone and financial risk preferences. *Evolution and human behavior*, *29*(6), 384-390.

Archer, M. S., & Archer, M. S. (1995). *Realist social theory: The morphogenetic approach*. Cambridge university press.

Ashkanasy, N. M., Becker, W. J., & Waldman, D. A. (2014). Neuroscience and organizational behavior: Avoiding both neuro-euphoria and neuro-phobia. Journal of Organizational Behavior, 35(7), 909-919.

Bhaskar, Roy. A realist theory of science. Routledge, 2013.

Battilana, J., Leca, B., & Boxenbaum, E. (2009). 2 how actors change institutions: towards a theory of institutional entrepreneurship. *Academy of Management annals*, *3*(1), 65-107.

Battilana, J., & Casciaro, T. (2013). Overcoming resistance to organizational change: Strong ties and affective cooptation. *Management Science*, *59*(4), 819-836.

Becker, William J.; Cropanzano, Russell. Organizational neuroscience: The promise and prospects of an emerging discipline. Journal of Organizational Behavior, v. 31, n. 7, p. 1055-1059, 2010.

Berger, P. L., & Luckmann, T. (1991). *The social construction of reality: A treatise in the sociology of knowledge* (No. 10). Penguin Uk.

Beugré, Constant D. 15. Brain and human behavior in organizations: a field of neuro-organizational behavior. Neuroeconomics and the firm, p. 289, 2010.

Bévort, F., & Suddaby, R. (2016). Scripting professional identities: How individuals make sense of contradictory institutional logics. *Journal of Professions and Organization*, *3*(1), 17-38.

Brett, Jeanne M. (2010) "Clueless About Culture and Indirect Confrontation of Conflict", *Negotiation and Conflict Management Research*, 3: 169-78

Bourdieu, Pierre. O poder simbólico. 1989.

Boyatzis, R. E., Passarelli, A. M., Koenig, K., Lowe, M., Mathew, B., Stoller, J. K., & Phillips, M. (2012). Examination of the neural substrates activated in memories of experiences with resonant and dissonant leaders. *The Leadership Quarterly*, *23*(2), 259-272.

Butler, Michael Jr; Senior, Carl. Toward an organizational cognitive neuroscience. Annals of the New York Academy of Sciences, v. 1118, n. 1, p. 1-17, 2007

Butler, Michael JR et al. How Organizational Cognitive Neuroscience Can Deepen Understanding of Managerial Decision-making: A Review of the Recent Literature and Future Directions. International Journal of Management Reviews, v. 18, n. 4, p. 542-559, 2016.

Butler, M. J. (2017). Organizational cognitive neuroscience–potential (non-) implications for practice. Leadership & Organization Development Journal, 38(4), 564-575.

Cho, T. S., & Hambrick, D. C. (2006). Attention as the mediator between top management team characteristics and strategic change: The case of airline deregulation. *Organization Science*, *17*(4), 453-469

Coates, J. M., Gurnell, M., & Sarnyai, Z. (2010). From molecule to market: steroid hormones and financial risk-taking. *Philosophical Transactions of the Royal Society B: Biological Sciences*, *365*(1538), 331-343.

Colomy, P. (1998, June). Neofunctionalism and neoinstitutionalism: Human agency and interest in institutional change. In *Sociological forum* (Vol. 13, No. 2, pp. 265-300). Kluwer Academic Publishers-Plenum Publishers.

Corbett, J., Webster, J., & Jenkin, T. A. (2018). Unmasking corporate sustainability at the project level: Exploring the influence of institutional logics and individual agency. *Journal of Business Ethics*, *147*(2), 261-286.

Dimaggio, P. J. & Powell, W.W. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. American Sociological Review, 1983.

DiMaggio, P. (1988). Interest and agency in institutional theory. *Institutional patterns and organizations culture and environment*, 3-21.

Dunn, M. B., & Jones, C. (2010). Institutional logics and institutional pluralism: The contestation of care and science logics in medical education, 1967–2005. *Administrative science quarterly*, *55*(1), 114-149.

Durand, R., & Thornton, P. H. (2018). Categorizing institutional logics, institutionalizing categories: A review of two literatures. *Academy of Management Annals*, *12*(2), 631-658.

Ertuna, B., Karatas-Ozkan, M., & Yamak, S. (2019). Diffusion of sustainability and CSR discourse in hospitality industry. *International Journal of Contemporary Hospitality Management*.

Fligstein, N. (1997). Social skill and institutional theory. *American behavioral scientist*, *40*(4), 397-405.

Friedland, Roger; Alford, Robert R. Bringing society back in: Symbols, practices and institutional contradictions. 1991.

Friedland, R. (2018). Moving institutional logics forward: Emotion and meaningful material practice. *Organization Studies*, *39*(4), 515-542.

Friedman, Jared et al. Antagonistic neural networks underlying organizational behavior. In: Organizational Neuroscience. Emerald Group Publishing Limited, 2015. p. 115-141.

Giddens, Anthony. The constitution of society: Outline of the theory of structuration. Univ of California Press, 1984.

Gonçalves, S. M., da Silva, R. V., & Teixeira, N. (2019). Individual actors and embeddedness in business-to-business interactions. *Industrial Marketing Management*, *76*, 181-191.

Goodrick, E., & Salancik, G. R. (1996). Organizational discretion in responding to institutional practices: Hospitals and cesarean births. *Administrative science quarterly*, 1-28.

Goodstein, J. D. (1994). Institutional pressures and strategic responsiveness: Employer involvement in work-family issues. *Academy of Management journal*, *37*(2), 350-382.

Greenwood, R., & Hinings, C. R. (1996). Understanding radical organizational change: Bringing together the old and the new institutionalism. *Academy of management review*, *21*(4), 1022-1054.

Greenwood, R., Díaz, A. M., Li, S. X., & Lorente, J. C. (2010). The multiplicity of institutional logics and the heterogeneity of organizational responses. *Organization Science*, *21*(2), 521-539.

Greenwood, Royston et al. Institutional complexity and organizational responses. Academy of Management annals, v. 5, n. 1, p. 317-371, 2011.

Greenwood, Royston; Suddaby, Roy. Institutional entrepreneurship in mature fields: The big five accounting firms. Academy of Management journal, v. 49, n. 1, p. 27-48, 2006.

Greve, H. R., & Man Zhang, C. (2017). Institutional logics and power sources: Merger and acquisition decisions. *Academy of Management Journal*, *60*(2), 671-694.

Grodal, S., & O'Mahony, S. (2017). How does a grand challenge become displaced? Explaining the duality of field mobilization. *Academy of Management Journal*, *60*(5), 1801-1827.

Hannah, S. T., Balthazard, P. A., Waldman, D. A., Jennings, P. L., & Thatcher, R. W. (2013). The psychological and neurological bases of leader self-complexity and effects on adaptive decision-making. Journal of Applied Psychology, 98(3), 393.

Healey, Mark P.; Hodgkinson, Gerard P. Rethinking the philosophical and theoretical foundations of organizational neuroscience: A critical realist alternative. Human Relations, v. 67, n. 7, p. 765-792, 2014.

Hong, Y. Y., Morris, M. W., Chiu, C. Y., & Benet-Martinez, V. (2000). Multicultural minds: A dynamic constructivist approach to culture and cognition. *American psychologist*, *55*(7), 709.

Hughes, E. C. (1937). Institutional office and the person. *American journal of sociology*, *43*(3), 404-413.

Meyer, J., Scott, W. R., & Deal, T. (1983). Research on school and district organization. *The dynamics of organizational change in education*, 409-425.

Kaiser, U., Kongsted, H. C., Laursen, K., & Ejsing, A. K. (2018). Experience matters: The role of academic scientist mobility for industrial innovation. *Strategic Management Journal*, *39*(7), 1935-1958.

Kline, A., & Dolamore, S. (2019). Understanding Data-Driven Organizational Culture: A Case Study of Family League of Baltimore. *Journal of Technology in Human Services*, 1-24.

Lounsbury, Michael. A tale of two cities: Competing logics and practice variation in the professionalizing of mutual funds. Academy of management journal, v. 50, n. 2, p. 289-307, 2007.

Martin, G., Currie, G., Weaver, S., Finn, R., & McDonald, R. (2017). Institutional complexity and individual responses: delineating the boundaries of partial autonomy. *Organization Studies*, *38*(1), 103-127.

Meyer, J. W., Rowan, B. Institutionalized organizations: formal structures as myth and ceremony. In: MEYER, J. W., SCOTT, W.R. Organizational environments ritual and rationality. London : Sage, 1992. p. 41-62.

Meyer, John W.; Rowan, Brian. Institutionalized organizations: Formal structure as myth and ceremony. American journal of sociology, v. 83, n. 2, p. 340-363, 1977.

Minas, R. K., Potter, R. F., Dennis, A. R., Bartelt, V., & Bae, S. (2014). Putting on the thinking cap: using NeuroIS to understand information processing biases in virtual teams. *Journal of Management Information Systems*, *30*(4), 49-82.

Modell, S., Vinnari, E., & Lukka, K. (2017). On the virtues and vices of combining theories: The case of institutional and actor-network theories in accounting research. *Accounting, Organizations and Society*, *60*, 62-78.

Morris, M. W., & Gelfand, M. J. (2004). Cultural differences and cognitive dynamics: Expanding the cognitive perspective on negotiation. *The handbook of negotiation and culture*, 45-70.

Nigam, A., & Ocasio, W. (2010). Event attention, environmental sensemaking, and change in institutional logics: An inductive analysis of the effects of public attention to Clinton's health care reform initiative. *Organization Science*, *21*(4), 823-841.

Ocasio,W. 1997. Towards an attention-based view of the firm. Strategic Management J. 18(S1) 187–206.

Ocasio, William. Attention to attention. Organization Science, v. 22, n. 5, p. 1286-1296, 2011.

Okhuysen, G., & Bonardi, J. P. (2011). The challenges of building theory by combining lenses. *Academy of Management Review*, *36*(1), 6-11.

Oliver, C. (1997). Sustainable competitive advantage: combining institutional and resource-based views. *Strategic management journal*, *18*(9), 697-713.

Ozdil, E., & Hoque, Z. (2017). Budgetary change at a university: A narrative inquiry. *The British Accounting Review*, *49*(3), 316-328.

Plassman, B. L., Langa, K. M., Fisher, G. G., Heeringa, S. G., Weir, D. R., Ofstedal, M. B., ... & Steffens, D. C. (2008). Prevalence of cognitive impairment without dementia in the United States. *Annals of internal medicine*, *148*(6), 427-434

Petersen, S. E., & Posner, M. I. (2012). The attention system of the human brain: 20 years after. *Annual review of neuroscience*, *35*, 73-89.

Powell, W. (1991). Expanding the scope of institutional analysis. *The new institutionalism in organizational analysis*, *Chicago*, 183-203.

Powell, Thomas C. Neurostrategy. Strategic Management Journal, v. 32, n. 13, p. 1484-1499, 2011.

Ragin, C. C., & Amoroso, L. M. (2011). *Constructing social research: The unity and diversity of method*. Pine Forge Press.
Saad, G. and Vongas, J.G. (2009). The effect of conspicuous consumption onmen's testosterone levels. Organizational Behavior and Human Decision Processes, 110, pp. 80–92.

Saad, G., & Vongas, J. G. (2009). The effect of conspicuous consumption on men's testosterone levels. *Organizational Behavior and Human Decision Processes*, *110*(2), 80-92.

Scott, W. Richard. Conceptualizing organizational fields: linking organizations and societal systems. In H. Derlien, U. Gerhardt & F. Scharpf (Eds.), Systems rationality and parcial interests (pp. 203-221). Baden: Nomos, 1994

Scott, W. Richard. Institutions and organizations. Thousand Oaks: Sage, 1995

Scott, W. Richard. Organizations: rational, natural, and opens systems. Upper Saddle River: Prentice-Hall, 1998. Ed. 4

Scott, W. Richard. Reflections on a half-century of organizational sociology. Annual Review of Sociology. Ed. 30, 2004, pp. 1-21.

Scott, W. Richard. The adolescence of Institutional Theory. Administrative Science Quaterly, v. 32, n. 4, p. 493-511, 1987.

Scott, W. Richard; MEYER, John W. Institutional environments and organizations: Structural complexity and individualism. Sage, 1994.

Scott, W. Richard. Unpacking institutional arguments. In W. W. Powell & P. J. DiMaggio, The new institutionalism in organizational analysis. (pp. 164-182). London: University of Chicago Press, 1991

Selznick, P. (1949). TVA and the Grass Roots.

Selznick, P., McEwan, I., Yukl, G. A., & VanFleet, D. D. (1957). Leadership in organizations.
Selznick, P. (1972). *A liderança na administração: uma interpretação sociológica*. FGV.

Senior, C., Lee, N., & Butler, M. (2011). PERSPECTIVE—organizational cognitive neuroscience. *Organization Science*, *22*(3), 804-815.

Seo, M. G., & Creed, W. D. (2002). Institutional contradictions, praxis, and institutional change: A dialectical perspective. *Academy of management review*, *27*(2), 222-247.

Spisak, B. R., Dekker, P. H., Krüger, M., & Van Vugt, M. (2012). Warriors and peacekeepers: Testing a biosocial implicit leadership hypothesis of intergroup relations using masculine and feminine faces. *PloS one*, *7*(1), e30399.

Thornton, Patricia H.; Ocasio, William. Institutional logics and the historical contingency of power in organizations: Executive succession in the higher education publishing industry, 1958–1990. American journal of Sociology, v. 105, n. 3, p. 801-843, 1999.

Thornton, Patricia H. Markets from culture: Institutional logics and organizational decisions in higher education publishing. Stanford University Press, 2004.

Thornton, P. H., Jones, C., & Kury, K. (2005). Institutional logics and institutional change in organizations: Transformation in accounting, architecture. *and publishing. Research in the Sociology of Organizations*, *23*(05), 125-170.

Thornton, P. H., & Ocasio, W. (2008). Institutional logics. *The Sage handbook of organizational institutionalism*, *840*, 99-128.

Thornton, Patricia H.; Ocasio, William; Lounsbury, Michael. The institutional logics perspective. John Wiley & Sons, Inc., 2013.

Tolbert, Pámela S.; Zucker, Lynne G. A institucionalização da teoria institucional. In: CLEGG, Stewart R.; Hardy, Cynthia; Nord, Walter R. Handbook de estudos organizacionais: modelos e analises e novas questões em estudos organizacionais. São Paulo: ATLAS, 1999.

_____. Institutional analyses of organizations: legitimate but not institutionalized. Los Angeles: Institute for Social Science Research, 1994. v. 6. (Biotechnology Studies, Paper 5).

Tolbert, P. S. (1985). Institutional environments and resource dependence: Sources of administrative structure in institutions of higher education. *Administrative science quarterly*, 1-13.

Töytäri, P., Keränen, J., & Rajala, R. (2017). Barriers to implementing value-based pricing in industrial markets: A micro-foundations perspective. *Journal of Business Research*, *76*, 237-246.

Turner, J. A., Klerkx, L., Rijswijk, K., Williams, T., & Barnard, T. (2016). Systemic problems affecting co-innovation in the New Zealand Agricultural Innovation System: Identification of blocking mechanisms and underlying institutional logics. *NJAS-Wageningen Journal of Life Sciences*, *76*, 99-112.

Waldman, David A. et al. A neurological and ideological perspective of ethical leadership. Academy of Management Journal, v. 60, n. 4, p. 1285-1306, 2017.

Waldman, D. A., Balthazard, P. A., & Peterson, S. J. (2011). Social cognitive neuroscience and leadership. The Leadership Quarterly, 22(6), 1092-1106.

Ward, M. K.; Volk, Stefan; Becker, William J. An overview of organizational neuroscience. In: Organizational Neuroscience. Emerald Group Publishing Limited, 2015. p. 17-50.

Willem, A., & Coopman, M. (2016). Motivational paradigms for the integration of a Belgian hospital network and merger presented in the printed press. *International Journal of Organizational Analysis*.

York, J. G., O'Neil, I., & Sarasvathy, S. D. (2016). Exploring environmental entrepreneurship: Identity coupling, venture goals, and stakeholder incentives. *Journal of Management Studies*, *53*(5), 695-737.

Zucker, Lynne G. (1977) Normal Change Or Risky Business: Institutional Effects On The 'Hazard'of Change In Hospital Organizations, 1959–79 [1]. Journal of Management Studies, v. 24, n. 6, p

Zyphur, M. J., Narayanan, J., Arvey, R. D., & Alexander, G. J. (2009). The genetics of economic risk preferences. *Journal of Behavioral Decision Making*, *22*(4), 367-377.

# 3. CHAPTER 2 – MULTIDISCIPLINARITY IN ORGANIZATION STUDIES: COGNITIVE NEUROSCIENCE AS A PATH TO A HOLISTIC AND INNOVATIVE PERSPECTIVE OF ORGANIZATIONS AND MANAGERS THINKING

## 3.1 INTRODUCTION

As in all fields of research, management and organization studies (MOS) always claim for innovative research that brings new insights from deeper, broader and complete analysis of organizational life and all components that constitute the organizational context. Even with many articles being published every year, there is still a need for innovation and creativity in MOS (Corbett et al., 2014; Suddaby et al, 2010). We see today a wide range of frameworks and streams of research that offer opportunities for converging perspectives, methods, and theories to enhance ontological, epistemological, methodological, and theoretical discussions. And beyond that, to improve the contribution of the studies for practice (Okhusen & Bonard, 2011). Due to this reality, we intend to propose a multilevel of organizational analysis through a new perspective: the combination of institutional logics perspective with organizational cognitive neuroscience (OCN) having critical realism as background.

New theories appear - or existent theories are developed forming bases for sustainable research agenda - mostly through a blend of conceptions when a new perspective is positioned in a particular scholarly community (Cornelissen & Duran, 2012). We believe that blending theories, perspectives, and methodologies from different research fields can be a way to amplify the vision that we had about organizational life. Organizations do not rise from nothing and do not exist alone. They emerge and survive because of important pillars: individuals, institutions, and society. Those pillars, combined, give organizations a holistic character that changes according to the context they are embedded.

Organizations evolve fast. Context changes fast. New businesses rise every day alongside new challenges and obstacles under different scenarios. Management and organization studies need to walk side by side with organizational reality, which is complex, permeated by different nuances and particularities. However, a debate involving innovation on organization studies has been traced with some scholars arguing about the necessity of genuinely indigenous theories of management and organization (Suddaby, Hardy & Huy, 2012). According to Suddaby et al. (2012), must papers received in a special issue of the Academic Management Review on organizational and management theory pointed out that theories, research questions and methods in management and organizational studies are

borrowed from "foreign disciplines" without a full adaptation to the organizational context, instead of the rising of new theories purely born from our field.

On the other hand, Lounsbury (2015) criticizes the pessimism related to organizational research, although acknowledging that some points and critics are useful is one of those we consider important: the lack of adaptation of borrowed theories to the organizational context. Lounsbury makes an analogy comparing the organization studies with a large museum full of masterpieces, but it is far away from being static. Organization Studies is a dynamic field, and new pieces are always being included, and those pieces bring lots of possibilities for the development of even more new collections – e.g., institutional logics perspective, networks, strategy as practice, performance feedback theory and, categorization.

These examples of new theories and perspectives were inspired by other fields to create their own concepts. Institutional logics perspective has its micro foundations based on concepts from dynamic constructivism and situationism (social psychology) (Thorton et al., 2013); strategy as practice has its basis built on a concern about the dichotomy between structure and agency inspired by the assumptions of Giddens (1991), Bourdieu (1998) e DeCerteau (1994) and the interpretive sociology of Weber (1978); and, categorization has been drawn on cognitive psychological models (Zuckerman, 1999).

Organizational theory, indeed, commonly borrow concepts, theories and ideas from other fields as pointed out, for example, by Sudabby et al (2011), Oswick et al (2011) and Floyd (2009) who are clamming for indigenous theories. What intrigues us is the real problem in using concepts from other fields instead of creating our own from scratch. There is no strong reason for defending indigenous theories against borrowing perspectives and blending theories if our concern lies in understand organizations – which are social complex environments - and provide knowledge and solutions to them.

We keep holding the idea that organizations are not independent and detached organisms. They exist because individuals, emerged in institutions under a socially constructed environment. The pillars responsible for the emerging of an organization comprise elements studied by those "foreign disciplines" and it seems reasonable to import theories and concepts from other areas for building theories in the organizational field.

Blending theories or using more than one lens to understand organizational phenomena is desirable once, according to Okhuysen and Bonardi (2011), management is full of phenomena that are prone to be studied using more than one theoretical approach, due to their complexity. An explanation that matches this complexity requires complex analyses drawn from the combination of different perspectives. The authors highlight the fact that multiple-lens

explanations increase the management field, which claims for studies and research that matters, that are relevant to our field, and that really reflect the reality of management since managerial decisions in private and public organizations affect millions of people in the world.

I acknowledge that extra prudence is necessary when researchers opt for blending theories bringing concepts and methods from other research fields, once we must always consider the particular context where organizations are submerged. Researchers must be aware when importing theories, methods, and concepts from another knowledge field. It is necessary to reflect on the real matter of importing perspectives to organizational studies and how to appropriately adapt to organizational reality avoiding turning the building theory process into a Procrustes Bed[2], where concepts and perspectives are indiscriminately forced to fit in to explain a phenomena without a significant contribution.

Besides the necessity of checking the real matter of borrowing knowledge from other fields to MOS, ontological misunderstands represent a risk for those who decide to engage in the endeavor of building theory. Scholars must be aware of the importance of a solid philosophical base to support their studies. There is a variety of ontological and epistemological interpretation that can lead to a wide range of types of science. Kilduff et al. (2011) highlight that organization scholars should use it in their favor choosing a positioning that suits better the philosophical assumptions that the phenomena and context under study demands.

That said, it is possible to agree with the authors who advocate that MOS needs novel perspectives capable of guaranteeing that all complexity, nuances, and particularities of organizational life are being covered. However, due to this complexity, we see no reason not to keep borrowing perspectives and concepts from other fields whether that makes sense and assure that it carries the possibility of covering the variety of nuances present in the organizational life. In this article, we discuss the necessity of researchers opt for new paths to create a new evolutionary leap on organizational studies advocating the blending of different methods and streams of research to build innovative perspectives and theories. We illustrate this promising possibility by proposing the union of the institutional theory – precisely the institutional logics perspective – with the Organizational Cognitive Neuroscience. Some scholars may consider that institutional theory is already complete in itself and wonder about the necessity of borrowing concepts and methods from other fields and the implications of

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[2] A Greek Mythology tale that relates the story of a bandit who lived in a wood and owned a giant bed. All passengers were arrested and forced to lay on his bed. Those who were too big to fit on the bed had some part of his bodies cut and those who were too small were stretched out until fit in.

doing so. I advocate that, although institutional theory – considering all perspectives - has a metatheory status and comprises all organizational levels, using a perspective from biological science requires a philosophical base that supports this combination. As a solution, I propose the use of Critical Realism as a background to support this converging between these, at a first sight, conflicting perspectives.

Combining these two perspectives is an attempt to cover the larger number of nuances and particularities of organizations considering their multilevel character and specific contexts bringing a new level: individual actor's brain.

I opted for the institutional logics perspective and OCN because both are promising fields for improving a holistic comprehension of organizational life. Organizations are influenced continuously and adapting to a constellation of material and symbolic pressures represented by the logics. As showed by the microfoundations of institutional logics, developed by Thorton, Ocasio and Lounsbury (2013, p.85), called the Cross-level Model of Institutional Logics, that adaptation requires cognitive functions and affect individuals and group focus of attention and involves internal and external issues in more than one level: macro, meso and micro.

But why go more in-depth and study an individual's brain? Organizations are highly complex social organisms embedded in even more complex environments (e.g., social contexts). Therefore, many of our most important decisions are made in contexts of social interactions. Thus, a brain will only engage in certain actions if it has a subconscious evaluation that there will be a positive return to its action within a given context that will drive the focus of attention. In general, organizational neuroscience is the study of several underlying neural systems relevant to social interactions in organizational contexts (Waldman and Balthazard, 2011). Hanna *et al.* (2013, p.406) suggest that the growing interest in management and organizational studies using biological methods can be named a cognitive revolution that culminates in a methodological revolution.

It is important to make clear that the use of neuroscience in organizational studies goes beyond applying brain technology to understand organizational phenomena. According to Butler et al. (2016), OCN is a multidisciplinary approach that aims to contribute with methodology and theory. OCN concerns not only with the study of the brain but also with the incorporation of this knowledge to organizational theory.

Once it's a new field, OCN needs further empirical research searching for filling the gaps of methodological and conceptual limitations (Healey & Hodgkinson, 2014). Although the short life of the field, the contributions of OCN for a better understanding of the nature of

human sociability in organizational contexts is recognized and it will help to develop models to predict decisions (Saad & Vongas, 2009; Butler, 2016). That means that it is time to construct maps that can drive scholars on this promising road in order to guarantee solid and relevant research instead of a simple application of neuroscience concepts and methods, putting aside the complex features of organizations.

Understanding the complexity of organizational life, Ashkanasy et al. (2014) suggested the importance of context in studies of the brain once it represents a new perspective about one of the oldest controversies in organizational behavior: the interplay between the individual and the context. This is one reason that OCN has an affinity with the institutional logics perspective: the importance of context to organizational behavior, especially to organizational adaptation to institutional logics. The framework I propose here allows a multilevel analysis: social, organizational and individual, including the brain.

However, as mentioned before, positioning two, at first sight, divergent perspectives a theory that is based on the social construction of reality with biological science - demands an ontological and epistemological position that supports this challenge.

I advocate that researchers follow the assumptions of critical realism. Critical realism lies in the space between objectivism and (radical) social constructivism. Its defining characteristic is the insistence on independent material reality, but also a negation of the direct correspondence between knowledge about material reality and reality itself (Bhaskar, 2013; Healey & Hodginknson, 2014).

The critical realism perspective read a common epistemological ground for the physical and social sciences retaining a unique ontology to the transitive objects of the study of the social sciences. The metatheory status of critical realism provides explanatory mechanisms common to all sciences, thus providing an ideal way for the link between neuroscience and organizational studies, enhancing ontological discussions about the use of this perspective to understand organizational phenomena.

To progress the debate regarding the use of institutional logics and OCN to understand organizational phenomena, I first revisit some concepts of both perspectives discussing its use combined with other methods and perspectives so far. Next, I discuss how critical realism can be a solid base to support the combination of institutional logics and OCN and how it is being used for both perspectives.

Finally, based on our proposal of combining the institutional logics perspective with OCN, which I call a Neuroinstitutional perspective, I outline the benefits of the combination of new perspectives as a possibility for innovation of organizational studies, since the researchers

have in mind that is necessary to pay attention to the requirement suitability: ontology, epistemology, multilevel character of organizations and context adaptation.

With our proposal of a Neuroinstitutional perspective as an example of blending theories, methods and concepts following a requirement suitability, we expect that the risks of new organizational and management studies became a Procrustes Bed are diminished.

## 3.2 INSTITUTIONAL LOGICS: COMBINATION OF LEVELS TO UNDERSTAND THE ORGANIZATIONAL LIFE

The institutional logics definition emerged to amplify the restricted focus of the neoinstitutional theory of Meyer and Rowan (1977), Zucker (1997) and DiMaggio and Powell (1983) on the organizational field, the institutional pressures suffered by the organizations and their isomorphic behaviors.

Although the previous ideas of institutional logics can be found in earlier studies of Social Sciences (Bourdieu, 1989), was in the 1990's decade that Friedland and Alford brought a better understanding of this perspective, conceptualizing institutional logics as "the set of material practices and symbolic constructions" present in a field (Friedland & Alford, 1991, p.218). It represents a broad set of principles that can be even mutually incompatible, which guide organizational interpretation of reality defining appropriated behavior and how to succeed and operate in a social situation (Greenwood et al., 2011; Thorton, 2004).

Institutional logics preservers some ideas of the neoinstitutionalism foundations: the concern about culture and cognition and its influence on organizational structures. However, there is a difference in the way how organizational structures and processes are adopted. The institutional logics perspective considers the relationship between society (represented by the logics), people and organizations in order to comprehend the variations instead of focusing on isomorphism and convergent change.

Society is permeated by multiple, independent and, sometimes, contradictory logics competing for a greater influence in all social domains. These logics are built from rituals and practices and represent a system of meaning and normative understanding often in conflict which foment conflicting expectations (Friedland & Alford, 1991; Greewood et al, 2011; Nigam & Ocasio, 2010).

Since the organizational behavior must be situated in society in order to be interpreted, institutional logics goes beyond the field boundaries. Same logics can be present in different fields and constitute the principle of a variety of field organization. The field is formed by a

group of actors operating in the same domain and their actions are guided by the same set of institutional logics, interdependent or competing, providing resources or constraining the actors' actions and goals (Friedland & Alford, 1991).

The capacity of institutional logics to enable and constrain individuals' actions driving their behavior and cognition expanded the restricted rational (seeking efficiency) and nonrational (seeking legitimacy) views of organizational actors (Durand & Thorton, 2018). Therefore, to comprehend institutions' influence on individual cognition and behavior is necessary to understand how institutions shape interest independently of the individual or organization. This influence is called the externality of an organization (Friedland & Alford, 1991). The authors point out ideas of how to bring the societal contents to the individual and organization's behavior highlighting the basic assumptions for developing a theory of levels of institutions that connect internal mental cognitions to rituals and external social stimuli.

Those assumptions give the institutional logics a multilevel character and the interrelation between these levels was well expressed by the Thorton, Ocasio and Lounsbury (2013) in their model called Cross-level Model of Institutional Logics. Embedded agency and institutional contradictions are the roots of microfoundations of institutional logics perspective. Other concepts related to human behavior and cognition are also considered in the model of microfoundations. In this model, represented in figure 2, institutional logics focus the attention of individual or group actors through cultural incorporation, activating the multiple identities, objectives and action plans of a social actor.

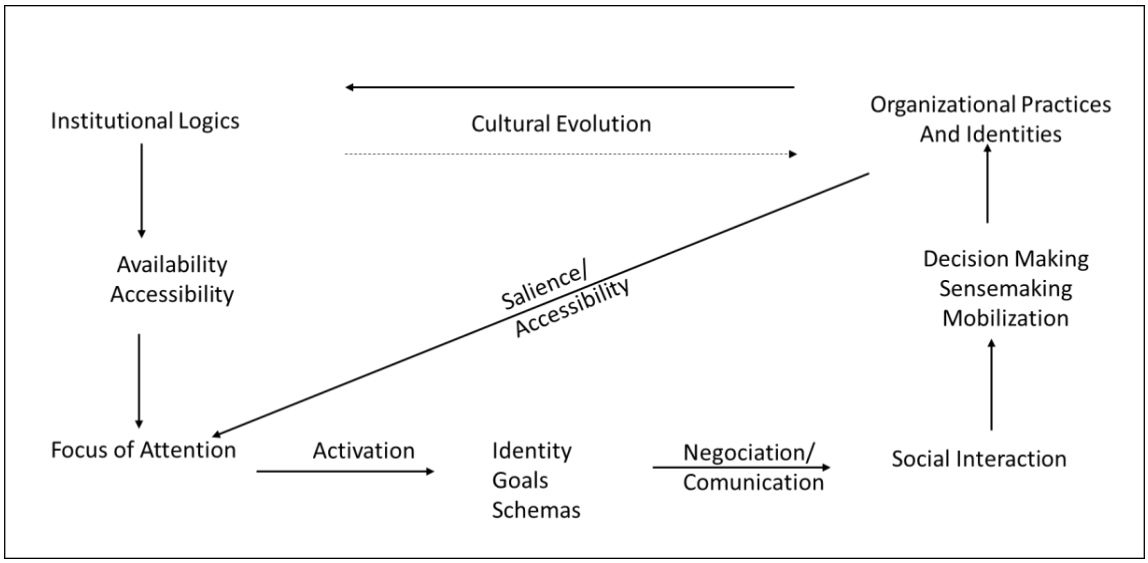


*Figure 2*: A Cross-Level Model of Institutional Logics Combining Macro-Micro and Micro-Macro. Adapted from Thorton, Ocasio and Lounsbury (2013, p.85)

Individuals and organizations not only have multiple identities but also goals that are often disagreeing, and will guide cognition and action in various situations and domains. Often, conflicts between goals remain unresolved, and will be activated by the processes of attention. According to the Institutional Logics perspective, goals as well as social identities are culturally incorporated within alternative institutional logics affecting individual cognition and action. Often goals are not congruent with individual's identities. Institutional logics help social actors construct structures or schemas aiming to shape attention, interpretation, inference and problem solving (Thornton, Ocasio, Lounsbury, 2013).

However, the individuals' capacity of allocating cognitive resources for information processing (attention) to any environmental stimulus and response to actions is limited. In an attempt to solve this limitation, organizations often develop structures and processes aiming to shape the focus of individual or group attention. Besides the organizations' efforts in driving individual focus of attention, the allocation is also guided by the institutional logics that shape the problems and issues that must be addressed, and the possible solutions to these issues, limiting action and cognition of the individual directly related to decision-making processes (Ocasio, 2011; Thornton, Ocasio, Lounsbury, 2013).

The institutional logics perspective opens an umbrella full of concepts and assumptions that enable researchers to increase their analysis and built new perspectives in order to innovate and truly bring contributions not only to the organization studies field but also and, equally important, to the organizations itself.

Meanwhile, there are still research opportunities unexplored that deserve attention and that could answer questions about organizational reality considering its various nuances and particularities. A search on Web of Science and Scopus platform for studies that proposed or realized a multilevel analysis of organizations using institutional logics perspective as a background revealed a small number of 36 articles, which is surprising once one of the main features of this perspective is the relation between macro, meso and micro levels. I considered only the articles that mentioned a multilevel concern in the title, abstract or keywords, once there are more than a thousand articles using institutional logics perspective in the last ten years.

The few number of articles exploring the multilevel character of the organization through the institutional logics perspective and the way they addressed – mostly using one method and without combining with other theories and perspectives - is a signal of conservatism and cautions from researchers once. I believe that this conservative posture is because a deeper understanding of more than one level requires adopting multiple methods and triangulation and,

even then, a blending with other perspectives that can talk with the institutional logics assumptions.

Some studies blended perspectives and theories and adopted more than one method in order to understand the levels of organization. Tracey et al (2011), for example, proposed bridging institutional logics and institutional entrepreneurship to analyze how new organizations are created and highlight the multilevel nature of this process through an in-depth case study of a social enterprise in the United Kingdom. Data was collected through participant observation, interviews and secondary data. Fuenfschilling and Truffer (2014) used historical analysis of documents to reconstruct the past and current field logics of Australian water sectors and discourse analysis to analyze a public inquiry on the Australian urban water sector's future. Smink et al. 2015 used interviews and secondary data in a multilevel approach to explore the interaction between producers and network operators in the case of biomethane injection in the Dutch natural gas grid. Barbour and Lammers (2015) adopted a multilevel confirmatory factor of analysis of multiple measures of professional identity constructs of physicians in order to contribute to the study of professionals by forwarding a strategy for measuring professional identity guided by the institutional logics perspectives.

I recognize the important contributions of those studies to the organization field. Notwithstanding, I could not observe an attempt of innovation to understand the multilevel character of organizations from the macro to micro and vice-versa, especially considering individual cognition. The high level of conservatism in studies that used institutional logics as a background may also be justified by the ontological difficulty of situating the study on a solid ontological and epistemological base. Though science is permeated by a variety of ontological philosophies that can support the most various uses of methods and perspectives, it is still rare to find studies in institutional theory that go beyond the dichotomy of positivism-interpretivism. Further up, I discuss critical realism's adoption as a solid base for blending OCN and institutional logics perspective.

It is possible to say that, although I have some innovations in the organization studies field - and I agree with Lounsboury (2015) that the rise of institutional logics perspective is one of those, I have to acknowledge that after the birth of this perspective - not much was done in terms of novel contributions through innovative ways of understanding organizations. While I have various methods being used and significant use of qualitative ones to understand microprocesses, I highlight the importance and benefits of multi methods research strategies. In the final considerations of the book Institutional Logics Perspective, Thorton et al (2013) clarify the importance of scholars' approximation and collaborations from different fields and

with different methods skills. Like building an enterprise, organization studies should be developed by multitskilled teams. All organizations have professionals from different areas and that is what makes an enterprise works. A combination of visions and experiences is one of the factors that drives the organization through the most different roads. And that is the reason I believe in the link between institutional logics and organizational cognitive neuroscience as being a fruitful ground to new and broad organization understanding. After all, if I study organizations and what them to use our knowledge, I should apply our concept of benchmarking in ourselves and learn from their experience in work as a multiskilled team.

Next, I briefly conceptualize the Organizational Cognitive Neuroscience and discuss the challenges of bringing neuroscientific methods to organization studies and possible ways to face them.

## 3.3 ORGANIZATIONAL COGNITIVE NEUROSCIENCE – UNVEILING THE BLACKBOX

As mentioned above, individuals have limitations related to allocating cognitive resources for information processing – the focus of attention - to any environmental stimulus and response to actions. The allocation of attention is highly influenced by organizations, which create structures and processes capable of driving individual's focus of attention. Also, institutional logics has an important role in organizational and individual focus of attention and cognition once the logics can determine, directly or not, the problems and issues that must be addressed, and the possible solutions to these issues, impacting on decision making (Ocasio, 2011; Thornton, Ocasio, Lounsbury, 2013). Besides the influence on the focus of attention, the institutional logics play an important role in influencing other cognitive functions, emotions, and other processes commanded by the brain.

The proximity of the premises of institutional logics perspective - the multilevel character, the influence of material and symbolic practice on individual actors, and embedded agency – with the assumptions of OCN is a signal of a promising field when combining those two approaches towards a neuroinstitutional perspective.

Organizational cognitive neuroscience (OCN) rose from the attempts to apply methods and concepts of cognitive neuroscience to understand organizational phenomena (Butler, 2016). Butler and Senior (2007), describes OCN as the study of processes within the brain that are the basis of or that influence human decisions, behaviors, and interactions **a) within organizations or b) in response to organizational manifestations or institutions.**

According to Senior and Butler (2011, p.805), those earlier definitions are incomplete, since it is restricted to the brain. A broader definition of OCN also considers the interaction between brain systems and cognitive mechanisms mediating the human behavior responses to organizational manifestation and institutions.

The definition of OCN has its roots in social cognitive neuroscience, and it is its applied form. OCN goes beyond a simple application of neuroscience methods in organizational studies, and OCN's primary concern is to guarantee a **multidisciplinary** approach in terms of method and theory. Like many studies that adopted neuroscience to understand the market, financial and some organizational phenomena, OCN is the study of the functioning of the brain within organizations and beyond that, is the incorporation of concepts and prior knowledge of the functioning of the brain system in the development of propositions about organizational phenomena (Butler, 2016).

Broadening the OCN definition by making it more complete is important, because it shows that organizational cognitive neuroscience is not only the study of brain systems themselves, but also the incorporation and use of prior knowledge of brain systems to develop new hypotheses about relevant organizational issues. Thus, it provides a broader scope by highlighting the interdisciplinary nature of organizational cognitive neuroscience, since research in this area can contribute to both organizational and cognitive neuroscientific knowledge (Senior & Butler, 2011).

Misunderstands about the concept and assumptions of OCN drives to an anti-reductionist argument, which advocates that using neuroscience to study organizations reduces the importance of social context and the other levels present in organizational reality. Lindebaum (2014; 2016) and Lindebaum and Zundel (2013), for example, strongly criticize the use of neuroscience on organization studies and one of their arguments is related to the risk of reductionism. They pointed out that, adopting neuroscience assumptions and methods to understand organizations is faded to fail due to problems caused by three types of phenomena reduction: theoretical, constitutive and explanatory. Still, according to the authors, the pursuing of an organizational neuroscience perspective leads to theoretical reductionism once there is no logic in use terms of a lower-level theory to explain a higher-level theory.

In response to these critics, Butler et al (2017, p.6) explained that OCN does not aim to reduce organizational behavior to brain functions and not even ignores any level of analysis, recognizing what they call "the symbiotic relationship between the layers of theory". They went far and gave us an example of how to use lower-level and higher-level theory connected. The authors mentioned the findings of Senior (2013) who showed that the neurophysiological

mechanisms responsible for the perception of pleasant or rewarding stimuli are activated when individuals receive a payment when finishing a task and concluded that this brain activity is predictive of success on that task. This finding shows us the existence of a subcortical network responsible for driving individuals to complete a task when they receive a motivator, as we can commonly see in the workplace. This is an example of theoretical engagement where low and high-level theories work together to clarifying the understanding of organizational reality.

The constitutive reduction is justified by the fact that there are organizational phenomena, such as leadership, that is social and related to interaction. That means, according to Lindebaum and Zundel (2013), that this type of phenomena is not composed of neurochemical processes and neuroanatomical structures, which is a naïve statement. Social interaction and relations only occur because of brain structures. Besides, as Waldman and Balthazard (2016) clarify, a brain will only engage in certain actions if it has a subconscious evaluation that there will be a positive return to its action within a given context. In general, organizational neuroscience is the study of several underlying neural systems that are relevant to social interactions in organizational contexts. It is clear that context and interaction are strongly connected with brain functions.

Because brain functions are directly related to the interaction that was always discussed by OCN, it is important to consider the context to achieve effective use of neuroscience to understand the organizational phenomenon. Ashkanasy et al. (2014) highlight the relevance of context in studies of the brain, once it represents a new perspective about one of the eldest controversies in organizational behavior: the interplay between the individual and the context. Despite the fact that recent studies (Hanna et al., 2013; Waldman & Balthazard, 2015; Friedman et al., 2015; Waldman et al, 2017) have demonstrated the implications and direct relevance of cognitive neuroscience for current theories and models of organizational situations, these approaches remove the context of their research inquiries. By doing so, researchers risk studying brain activities and neurological responses that are different from those which consider context and the situations present in real life of individuals and organizations. Brain activities cannot be considered as basic building blocks that can, isolated, explain organizational phenomena and cannot be studied in isolation from its context (Senior & Butler, 2011). In other words, the application of the OCN perspective makes sense if combined with pre-existence theories capable of encompassing all levels of organizational life. I advocate the use of OCN combined with the institutional perspective as one way to put in practice its *raison d'être*: the interaction between brain processes and cognitive mechanisms mediating the human behavior responses to organizational manifestation and institutions.

As well as it is not advisable to conduct top-down organizational research without considering the existence of cognitive and neural systems of groups and individuals, it is also challenging to conduct bottom-up research considering only brain activity and neurological responses without taking into account the role of the social context in which individual, groups and organizations are part of. Thus, according to Senior and Butler (2011, p.806) "where there are competing theories of the same organizational phenomena, the organizational cognitive neuroscience approach may be able to provide more convincing evidence to determine which one is the more accurate explanation". Just as organizational research - which is informed by top-down and bottom-up perspectives - are able to deepen our understanding of organizational research problems, approaches that consider the underlying brain systems and cognition can enrich our understanding related to organizations.

I acknowledge that the use of neuroscience to understand organizations is a task that must be carefully taken. Although I advocate the use of OCN and its capacity to amplify the comprehension of organizational life in a holist way, I have to alert researchers about its overestimation and the indiscriminately use of neuroscientific methods only because of a fashion or a claim for innovation. There must be a concern, balance and, evaluation of the suitability of using the OCN perspective to study some organizational phenomena.

Jack et al. (2019, p.447) made a thorough review of articles using neuroscience to understand organizational phenomena published in high-rate journals. The criteria used to analyze the studies was: rigorous review of relevant neuroscience literature; explicit hypotheses *or* justified exploratory approach; accurate interpretation of findings; limitations, alternative explanations acknowledged and discussed. Although their well discussed analysis if authors are correctly applying neuroscience methods and knowledge in their studies, it is necessary to go further and check if all these efforts are accompanied by relevant implications for MOS and organizational practice.

Thus, I opted for adding other criteria to analyze MOS studies that aim the use of neuroscience: how they addressed the existent organizational theory, concepts or perspective, once I believe that simply applying neuroscientific methods and concepts without considering the importance of context and the multilevel character of organizations is not sufficient to promote relevant contributions.

Dulebon et al (2009) used the organizational justice literature to discuss if procedural and distributive justice is different constructs using fMRI. Besides the lack of a robust review of neuroscience literature that can drive naïve readers to misinterpret their findings (Jack et al., 2019), the authors present fMRI as a useful method to confirm distinctiveness between the two

types of justice. However, the discussion of the results and its implications for theory and practice represents a small part of the study highlighting only the fMRI as a solution to discuss the difference between procedural and distributive justice. Combining the lack of a robust neuroscience review that could lead to different interpretations of the results with a poor link with MOS, the study takes the risk of being criticized for reductionism and just an attempt to follow the fashion of including neuroscience in organization studies.

Waldman et al (2017) theorized and tested the interrelations of moral self's neurological and cognitive/ideological aspects in the prediction of ethical leadership. The authors adopted a cognitive view to enhancing the debate about how brain activity acts as a source for social cognition and behavior in organizations. The data was collected from two different types of participants: mid and senior-level U.S. Army officers and executive MBA students. They linked the empirical finds through EEG with the premises of ethical leadership. Besides that, the authors highlighted the importance of context for a better understanding of the phenomena once there were differences in the result of the military and executive students. In other words, it is a mistake to conduct an organizational study using neuroscientific methods and concepts without associate it with organizational and/or occupational context.

Bagozzi et al (2013) integrated a higher-level social psychological explanation with low-level explanations regarding Machiavellianism, dismembering the processes in specific regions of activation in the brain through three different experiments. Neuroscientific explanations about the bases for Machiavellianism contribute, for instance, to increase the understanding of how and why people take advantage of the organization. Besides that, the authors underline the association between Machiavellianism and social anxiety, unethical behavior, manipulation, uncooperativeness and other types of behavior that impacts on organizational performance. This study is a clear example of the relevance of using OCN to better understand organizational phenomena with a multilevel approach through interdisciplinary research - neuroscience, MOS and psychology.

Tietema (2019) studied selective and sustained attention. Although they used a neuroscientific explanation of attention under the OCN perspective, the author used interviews to investigate which principles of attention employees use in the workplace. Attention is a relevant construct for organization studies as already pointed out by Ocasio (2011) and constantly investigated by cognitive neuroscience. However, even considering organizational and individual levels, the study does not rely on an organizational theory or perspective supporting the analysis, which results in a lack of relevant contribution to MOS and practice.

It is already clear the possibility of important contributions of bringing neuroscience to MOS if the researchers take care in applying the OCN premises in order to guarantee suitability which is, once again: the interaction between brain systems and cognitive mechanisms mediating the human behavior responses to organizational manifestation and institutions: **a) within organizations or b) in response to organizational manifestations or institutions.**

Nevertheless, I am aware of the difficulty of choosing an appropriate theory and ontological and epistemological bases to better answer the research question. Facing that reality, the next session provides a neuroinstitutional perspective proposal to illustrate an appropriated blending of OCN with MOS using critical realism to support ontological and epistemological implications.

## 3.4 USING CRITICAL REALISM FOR BLENDING VIEWS – TOWARDS A NEUROINSTITUTIONAL PERSPECTIVE

There is still skepticism about the use of neuroscience in organization studies. But this reaction is not a particularity from our field. Jack et al (2019) inform us that the same skepticism related to the real contribution of neuroscientific methods happened in other fields of psychology and cognitive science. However, that scenario changed, and even researchers who were highly against neuroscience recognized the importance of its contributions to those fields. I believe that the same story can happen in our field. But for this occur, researchers must become more and more familiarized not only with the methods and how to interpret the data, but also with how to justify the suitability of the method and assumptions choose to the theory and the research question instead of simply borrowing neuroscience and put it on a Procrustes Bed forcing it to fit the research question and the organizational theory.

Our objective is to encourage researchers to innovate and bring substantial contributions by applying neuroscience concepts and methods to understand organizational life. Several articles are discussing general implications of how neuroscience can contribute to management and organization studies and the limitation of its use (e.g., Senior et al, 2011; Lee et al, 2012; Waldman, 2013; Healey et al, 2016; Ashkanasy et al, 2014; Becker et al, 2011) ). These studies are important for a field of research starting to grow, but I believe that it is time to give specific directions for those scholars who wish to endeavor on this quest. Instead of general discussion, I decided to propose the combination of OCN with a particular perspective: institutional logics. Our intention is not only to draw a possible way for institutional theory

scholars, but also for other researchers who wish to use our guide to guarantee the suitability of OCN to their studies.

I already discussed that one primary concern about using neuroscience in organization studies is reductionism. And, indeed, the holistic character of organizations must be taken into account when a researcher decides to use OCN. In an attempt to avoid pitfalls and reductionism, I developed requirement suitability illustrated by our proposal of a neuroinstitutional perspective.

### 3.4.1 Requirement Suitability: Positioning OCN into the Institutional Logics Perspective

The requirement suitability comprises four items that a researcher has to consider when deciding to merge neuroscience with management and organization studies: ontological, epistemological, multilevel character of organizations, and context.

#### 3.4.1.1 Ontological and Epistemological Suitability

Building a research that brings the use of neuroscience into organizational studies is challenging and brings important philosophical and epistemological implications once we are blending a natural science with a social science adopting a posture in which social reality is not given in concrete form but, instead, comes from construction based on a subjective and intersubjective experience of individuals.

The rush for innovation in management and organization studies through the use of brain technology is causing neglect of the philosophical implications of neuroscientific research inside our field. Feel works have discussed philosophical issues and their importance when blending neuroscience with organization studies (see Lindebaum, 2016; Lindebaum & Zundel, 2013; Bagozzi & Lee, 2019). However, it would be most beneficial at this time, that the field is becoming burgeoning, if the philosophical implications of neuroscientific research were more debated by management and organization scholars.

Bagozzi and Lee (2019) proposed a set of philosophical foundations that can be adopted by researchers that deserves to understand the organizational phenomena considering the social construction of reality – emergentism, nonreductive functionalism, dualism, downward causation, folk psychology, and, in accordance with Healey and Hodginkson (2014), critical realism.

As pointed out by Healey and Hodginknson (2014), cognition is embodied and socially situated which makes neuroscience one of the building blocks for organizational knowledge. And cognition is a fundamental base of institutional logics being present in the Cross-Level model proposed by Thorton et al (2013). Nevertheless, historical attempts to merge the social sciences with the natural sciences are in disorder with a hundred articles drawing poor conclusions because of confusions about basic philosophical questions. The authors argue that for organizational studies researchers to benefit significantly from neuroscience, they must establish viable forms of engagement with empirical and theoretical developments in this rapidly expanding field, without neglecting the socially embedded nature of organizational life.

In an attempt to eliminate ontological pitfalls and epistemological errors when combining OCN with institutional logics, I propose, in agreement with Healy and Hodginkson (2014), the adoption of critical realism assumptions. Besides that, there are studies of institutional logics that rightly adopted a critical realist view to deal with the dichotomy of structures and agency (e.g., Modell, 2015; Baker & Modell, 2019; Van Bockhaven et al, 2013; Geary & Aguzzoli, 2016; Kahn, 2018; Essen & Varlander, 2019).

It is not the scope of this study describing the other philosophical views, but I encourage researchers not to neglect philosophical issues and to evaluate which philosophical base is more capable of supporting their studies.

First of all, it is important to underline that I recognize the metatheory character of institutional theory and that it has, as one of its major features, the use of the macro level to understand meso and micro and vice-versa. Because of that, some scholars might question the necessity of bringing critical realism as an ontological and epistemological base for their studies, once the institutional theory is complete in itself.

When applying neuroscience concepts and methods through the OCN perspective, we enter the individual level sphere in a more profound way: considering biological processes related to the brain. That is an innovative and challenging step to institutional theory and it demands a compatible ontological and epistemological bases that encompass the specificities of putting together a theory that has its bases on the social construction of reality with a perspective that has its bases on biological science.

To face this challenge, I propose the adoption of critical realism not only to avoid reductionism, as proposed by Healey and Hodingkson (2014), but also to avoid criticism about combining social with natural science without an appropriate philosophical base.

Critical realism is positioned between objectivism and (radical) social constructivism. One of critical realism characteristics definition is the existence of an independent material

reality and a negation of the direct correspondence between knowledge about material reality and reality itself (Bhaskar, 2013; Healey & Hodginknson, 2014).

Bhaskar (2013) makes a fundamental distinction between the intransitive and transitive dimensions - or objects - of knowledge. The intransitive dimension refers to the objects of science that exist independent of the human conception, that is, what we are studying (physical processes, such as light, neurons, iodo; or social phenomena, for example, unemployment, leadership). The transitive dimension encompasses theories and sciences that aims to explain the intransitive dimension (theories, paradigms, models). In this way, rival theories and sciences may have different transitive objects to explain the same intransitive dimension. (Sayer, 2000; Bhaskar, 2013; Healey & Hodginknson, 2014).

From this point of view, Bhaskar (2013) proposes the separation between the real, the actual and the empirical, stratifying reality as follows: (i) the "real" world of causal powers, which contains deep structures and generative mechanisms that originate real events; (ii) the actual, that is, the flow of events produced as natural states of things or under controlled conditions; and (iii) empirical events, known directly or indirectly through observation and experience.

The real cannot always be observed or, sometimes, it is not necessary to observe it. In some cases, one can observe the real, such as an organizational structure and the effects produced by its action, but it is not possible in other cases. Although observing the real enables the researcher to be more confident about its existence, its existence is not dependent on observation. Therefore, instead of solely trusting observation, realists accept the causal criteria. Thus, Healey and Hodginknson (2014) argue that, pragmatically, this stratification allows the coexistence of competing knowledge.

Take the institutional logics as an example. The existence of institutional logics cannot be observed but its actions cause effects that can be studied, such, for instance, its influence on the focus of attention and, consequently, on decision-making. The institutional logics (the intransitive dimension) effects on focus of attention and its consequences to organizational responses can be studied by more than one transitive dimension. A researcher can conduct in-depth interviews to collect the individuals' perception of how those logics affect their attention and uses discourse analysis to analyze it. The same influence of institutional logics on the focus of attention can be biologically measured using neuroscientific methods such as electroencephalogram, for instance. Or, a researcher can collect data in order to understand decision making under a constellation of logics during a board meeting through audio and video recording and not use only qualitative methods, but a software that measures body language

and facial expression as well. Therefore, it's important that this research relies on the premises of critical realism.

Bhaskar (2013) argues that social phenomena emerge from biological phenomena, meaning that social action depends on the agents' physiological state, including signals sent and received by neural cells. But he emphasizes that it is not the condition for action, conversation and interaction. Considering only physiological issues may drive the researcher to reductionism of the phenomenon. It means that critical realism is not completely naturalist, that is, although social Science might employ biological methods borrowed from natural Science to understand causality, an interpretive understanding due to the complexity of the phenomena is required (Sayer, 2014). Thus, bridging discourse and brain functioning to understand the influence of material and symbolic issues on the individual cognition, and consequently, on the focus of attention, behavior and its impacts to decision making, sensemaking, social interaction and mobilization (Thorton et al, 2013), is an alternative to provide a broader understanding of the phenomenon and encourage ontological discussion about the use of the critical realism to understand organizational reality.

Unlike the structuring theory, which defends that the structure does not have autonomous effectiveness and only manifests itself through practice, while resource and rule manipulation is conducted by the agents (Giddens, 1984; 1996), critical realism posits that people and structures are analytically dissociable by virtue of their emerging properties. Archer (1995) presents three modalities of these emerging properties: i) emerging structural properties; referring to material domain; ii) emerging cultural properties; referring to domain of the beliefs and systems of knowledge, which cannot be reduced to the individual level and, iii) emerging personal properties; referring to the individual (psychological and biological features), to the agents (represented by groups), and to the actors (who take a role in the group).

Using critical realism as a background to understand the influence of material and symbolic issues on cognition, focus of attention and, consequently, in organizational adaptation through a neuroinstitutional perspective allows us to discuss the three modalities of emerging properties proposed by Archer (1995).

A notable feature of critical realism is that it envisions a common epistemological ground for the physical and social sciences retaining a unique ontology to the transitive objects of study in the social sciences. The researcher must assume a position against the independence between social structures and processes as an influence that constrains organizational actors. The metatheory status of critical realism provides explanatory mechanisms that are common to

all sciences, thus providing an ideal way for the link between neuroscience and organizational studies.

#### 3.4.1.2 Multilevel Suitability

As mentioned above, there is an anti-reductionism movement that criticizes the use of organizational cognitive neuroscience in MOS (Lindebaum, 2013; McLagan, 2013; Lindebaum & Zundel, 2013; Lindebaum & Jordan, 2014; Lindebaum, 2016). Albeit some authors had already explained that bridging neuroscience with organization studies goes beyond simply applying neuroscientific techniques indiscriminately (see Butler, 2017; Becker et al, 2011; Healey & Hodgkinson 2014) I acknowledge that, guided by a necessity of innovation or just to follow a fashion, there is still a risk of researchers build reductionists studies and, do not consider and benefit from the countless of contributions to understand better more than one level of analysis using OCN.

When scholars decide to benefit from neuroscience to study organizations they have to clearly map and define what levels their research intends to understand before getting on board. Of course, changes can occur on the way, but it is important to always keep in mind the implications for other levels of analysis, besides the individual one, that the endeavor of using neuroscience may present.

To truly extract all the contributions that neuroscience can bring to our field, it is necessary to build research questions that encompass the multilevel character of organizations as a way to guarantee the appropriated use of OCN. As important as the research question is the theory or perspective chose. OCN *per se* does not have the intention of ignoring any level of analysis and recognize the symbiosis between the layers of a theory (Butler, 2007a; Lee et al., 2012a, 2012b; Senior et al., 2011a.). But when combining OCN with a multilevel theory, the chances of reductionism tends to diminish. The use of OCN and institutional logics perspective is an example of multilevel suitability, once the institutional logics is interested in culture and cognition and how these factors affect organizational structures and society. Binder (2007: 568) emphasizes the multilevel character of logics arguing that

> Logics are not purely top-down: real people, in real contexts, with consequential past experiences of their own, play with them, question them, combine them with institutional logics

> from other domains take what they can from them, and make them fit their needs.

This argument clarifies the important role of the individual in shaping organizational reality highlighting not only the existence of top-down processes but bottom-up as well. The set of material practices and symbolic constructions guide organizational interpretation and operations in social situations and individuals are endowed by the capacity of shape and change logics (Friedland & Alford, 1998; Thorton, 2004; Thorton & Ocasio 2008; Greenwood et al., 2011).

I opted for using the focus of attention – one of the institutional logics microfoundations - as an example of how blending OCN and institutional logics to obtain rich multilevel analysis. Given the cognitive underpinning of the institutional logics perspective and the seek for understanding how logics influence individual behavior, there is a notable interest in how institutional logics drive the focus of attention and how it affects decision making, the activation of schemas, problem solution, etc. If a researcher decides to study organizational and individual focus of attention, it is possible to provide the top-down and bottom-up analysis (Ocasio, 2011). The focus of attention is the result of a combination of top-down (driven by goals and schema) and bottom-up (driven by environment stimuli) attention. Institutional logics and organizational practices provide structures to guide individual's and group's focus of attention in a top-down process, while the prominent features of the environment and situations drive bottom-up attention (Ocasio, 1997).

The use of OCN to capture the influence of institutional logics on individuals' focus of attention allows a deeper understanding of what happens inside the organizational actor's Blackbox and analyze not only what is being said – through traditional methods such as in-depth interviews, surveys, etc. – but also what is not being said.

The focus of attention is directly related to the interpretation and responses to pressures arising from multiple logics in the environment. Thorton et al (2013) point out that a greater concern with the focus of attention is necessary, since the logics not only restricts, but also expand it. Figure 3 is an example of how OCN can be used to explain the influence of those logics on individual and organizational attention.

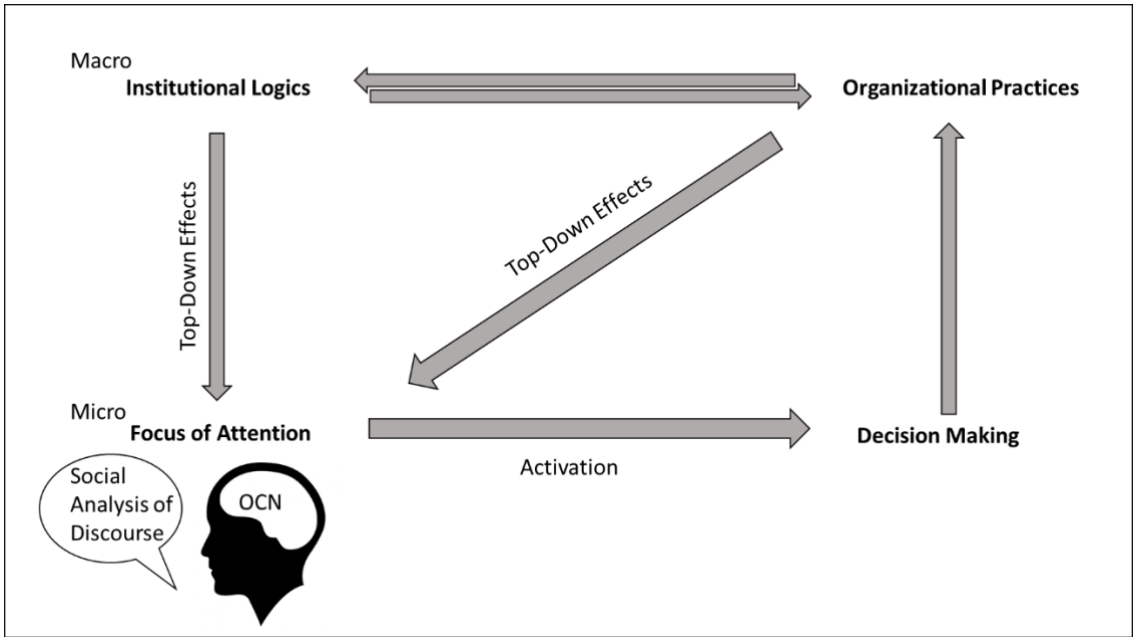


*Figure 3*: Graphic Representation of the relations between OCN and Institutinal logics to study focus of attention.

Institutional logics are present in the field where organizations are in. Furthermore, organizational actors are culturally embedded in dominant institutional logics. These logics, whether interdependent or conflicting, influence organizational actions, including the allocation of individual's and groups' focus of attention. Thus, institutional logics guide the attention of the organization, which in turn creates mechanisms and processes to shape the attention of individuals and the groups through social interactions (Thornton, Ocasio, Lounsbury, 2013).

Hence, organizations face ambiguity and cognitive limitations that impact executive decision-making, limiting their capacity to respond and adapt to all determinants of their environment. Thus, a decision will never achieve perfectly and completely its goals (March & Olsen 1979; Simon, 2013). This limitation is also related to the fact that individuals have restrictions in their ability to allocate cognitive resources for information processing (attention) to any environmental stimulus and response to actions. Thus, they are constrained to focus their attention on a limited set of issues (Ocasio, 1997). Organizations develop structures and processes, aiming to direct the focus of individual or group attention (Thorton, Ocasio, Lounsbury, 2013).

I consider that it is possible to comprehend how institutional logics guide the focus of attention of the individual and the group – through social interactions - providing an understanding of the influence of material and symbolic issues on organizational adaptation, which will impact, directly, the organizational practices combining, for instance, discourse analysis and the use of Electroencephalograph (EEG), for example. Researchers have employed

qEEG technology, in studies that addressed decision-making in organizational contexts (Balthazard et al., 2011; Balthazard et al., 2012; Waldman, et al., 2012; Waldman et al. 2011; Hanna et al., 2013; Ravaja et al, 2013; Minas et al., 2014; Tharawadeepimuk & Wongsawat, 2017). Using these techniques, researchers can measure and comprehend the brain morphology and the functions associated with behavior contributing to a better understanding of phenomena like decision-make, leadership and general human behavior of the individual or of groups or teams within organizations (Bathazard & Tatcher, 2015). And adopting a decision-making perspective incorporated into institutional logics perspective allows the researcher to go beyond the understanding of brain morphology and functions associated with behavior that led to organizational decision. It is possible to analyze its consequences to the reproduction and transformation of institutional logics adding more layers to this perspective.

A naïve application of OCN without understanding its assumptions to organizational studies carries a risk of mapping the brain to explain behaviors without considering the impact and implications of the results on the other organizational levels, which would be spending resources. The cognitive neuroscience perspective is a multilayered approach and its concern goes beyond the understanding of brain structures and activities (Gazznniga, 2000) and OCN is an applied subfield of this science. Thus, the OCN's main assumption is to explore and understand human behavior within and in response to organizations which is a set of theoretical layers (Butler & Senior, 2007; Butler et al, 2017). The conscious choice of a multilevel theory or perspective aligns with methods that can capture nuances from different levels is an important step to check if blending the theory chose with OCN is suitable to answer the research question.

#### 3.4.1.3 Context

One of the premises of OCN perspective is the context where humans are embedded. It is important to remind that

> (…) OCN does attempt to reduce organizational behavior to just brain activity, ignoring the wider social context; the organizational cognitive neuroscientist is interested in understanding the molecular logic of organic knowledge systems **only** when placed in their natural social ecology" (Lee et al., 2012:216)

It seems reasonable that, instead of avoiding borrowing concepts from other fields, organization and management studies should use knowledge from outside to understand organizational phenomena. As long as the outsider knowledge – OCN in this case - is able to contribute to amplify the field bringing new lenses to answer research questions considering the context and particularities of organizational life expanding our view bringing new concepts and complementing the existent ones, there is no logic in combating such practice.

It is important to keep in mind that, although I advocate an approximation between OCN and management and organizational studies, a mere application of neuroscientific methods to understand organizations is far from our proposal and the purpose of OCN itself. It is essential that the researcher has in mind that one way to guarantee that context will be considered in the study is to carefully choose a theory or perspective robust enough to cover the variety of nuances and contexts where organizations are embedded.

The institutional logics perspective highlights the connection between level of analysis, emphasizing the necessity of understanding individual and organizational behavior as always embedded in and influenced by societal context (Friedland & Alford, 1991). A careful researcher can extract all the benefits of blending OCN and institutional logics toward a neuroinstitutional perspective if keep in mind that each organization is under a particular context that must be considered during all stages of the research. Institutional logics perspectives appear as a fruitful choice once it is impossible to study the influences of material and symbolic practices without considering context once micro and organizational behavior are affected by societal institutional logics. In addition to the careful choice of the theory used, it is necessary for the right choice of the most appropriated methods. I reinforce that the simple use of neuroscientific methods misinterpreting OCN premises can lead to a failure and forced attempt to use biological sciences to explain one broad phenomenon permeated by nuances and particularities inherent to different contexts. Doing so, the researcher would make the mistake of using lower-level theories to explain higher-level ones without merging them towards a broad comprehension of the phenomena under study.

But how to guarantee that the context is present in the analysis? It is not sufficient to choose the right theory to answer the research question. It is also essential the choice of a multimethod approach capable of capturing the information necessary to draw the context where the phenomena under study occur. Secondary data, surveys, interviews, participant and non-participant observations are examples of methods that can ensure that context is being considered during the data analysis of neurological information captured from the participants.

Combining those methods so well used in MOS with neuroscientific methods and techniques supported by the OCN perspective contributes to an exciting way to understand the individual actors' Blackbox in the context of organization studies, increasing knowledge.

## 3.5 CONCLUSION

Based on the need for innovation added to a constant necessity of a broader and a multilevel understanding of organizations, I proposed a blending of OCN with institutional logics perspective called Neuroinstitutional perspective, supported by critical realism. I am aware about the increase of the claim for high quality innovative studies and, at the same time, for studies that have roots genuinely in our field instead of borrowing from other sciences. However, I see no reason in avoiding the use of outsider theories and perspectives. Management and Organization Studies still has much to benefit from other knowledge fields.

Instead of criticizing the evolution of our field based on the application of concepts from other sciences, we should be concerned about developing robust perspectives and models that suit with organizational reality. Organizations are complex. Each one has particularities and features that change depending on the context in which they are embedded. Their rising and sustainability involve a set of different entities, from individual actors to institutions and society. It would be naïve or even presumptuous the belief that management and organization knowledge should be built upon indigenous theories and perspectives. It is necessary to build holistic ways to understand organizational life and to do so, borrowing from other fields is desirable and necessary. Nevertheless, borrowing from other fields demands caution once it involves ontological and epistemological issues.

The use of neuroscience in management and organization studies is an example of an attempt to bring novel ways to study organizational behavior. However, the indiscriminate use of neuroscientific methods – or other concepts and perspectives and methods from other fields - without an appropriated philosophical base can lead the research to pitfalls and no substantial contributions to theory and practice.

Bridging institutional logics perspective with OCN towards a Neuroinstitutional perspective has a great potential to promote a holistic understanding of material and symbolic practices' influences on individual behavior.

Once we know the difficulty of putting different lenses together to understand a phenomenon and the risk of the study became a Procrustes Bed, we highlighted a set of four requirement suitability: ontological, epistemological, multilevel character and context. I hope

that this requirement suitability guides researchers who decide to merge OCN with institutional logics and other perspectives inside the management and organization studies.

I acknowledge that we did not address other philosophical bases but critical realism, but that is not the scope of this article. For future research I suggest a deeper discussion about philosophical possibilities for blending neuroscience with management and organization studies such as emergentism, nonreductive functionalism, dualism, downward causation, and folk psychology. Also, I recognize other relevant issues related to OCN's use in MOS such as ethical implications, accessibility, and the costs involved. However, this is not the aim of the present research.

Also, regardless the increase of articles advocating the benefits of bringing neuroscience to our field, I recognize the necessity of a guide of how to use the neuroscientific methods available to amplify the understanding of the relations between institutional logics and the individual actor. There are several possibilities to be explored by using OCN to understand logics influencing and being influenced by individual actors: focus of attention, decision making processes, nonverbal language (emotions and body language), influence of beauty, facial morphology, hormone/stress levels, facial asymmetry, fluctuating asymmetry, gender and so on (see Zyphur et al., 2009; Saad & Vongas, 2009; Apicella et al. 2008; Coates et al., 2009; Boyatzis et al., 2012; Krueger et al., 2009; Balthazard et al., 2012; Hanna et al., 2013; Minas et al., 2014; Peterson et al., 2008; Waldman et al., 2011; Spisak et al., 2012; Wong et al., 2011; Senior et al., 2012).

With all those possibilities I see the Neuroinstitutional perspective as a promising field to promote a holistic view of organizations. Organizations are complex. And complex organisms demand complex analysis. Instead of fomenting a distancing from other fields in an unlogic attempt of creating indigenous theory, I believe that management and organization studies should invest efforts in greater collaboration with other fields once this is one way of executing cross-level and multimethod approaches capable to capture the diversity of nuances present in the organizational life (Thorton et al, 2013).

Seeking for theory innovation means to get out of the comfort zone. Engaging on a Neuroinstitutional perspective implies in leave the cruise navigation to enter the Bermuda Triangle. But for that it is essential to have the right maps and toolkits to face the challenge. And that is what I propose here: an attempt to an appropriate blend of perspectives.

I believe that research rooted in a robust combination of perspectives can be generative and enhance management and organization field given the large number of questions that still remain without answer. This study is an invitation for scholars to get on board and contribute

to MOS through innovative ways to do research. And this is the goal of the Neuroinstitutional perspective: an attempt at a robust, holistic and novel area in organization studies.

REFERENCES

Archer, M. S., & Archer, M. S. (1995). *Realist social theory: The morphogenetic approach*. Cambridge university press.

Ashkanasy, N. M., Becker, W. J., & Waldman, D. A. (2014). Neuroscience and organizational behavior: Avoiding both neuro-euphoria and neuro-phobia. Journal of Organizational Behavior, 35(7), 909-919.

Bagozzi, R. P., Verbeke, W. J., Dietvorst, R. C., Belschak, F. D., van den Berg, W. E., & Rietdijk, W. J. (2013). Theory of mind and empathic explanations of Machiavellianism: A neuroscience perspective. *Journal of Management*, *39*(7), 1760-1798.

Bagozzi, R. P., & Lee, N. (2019). Philosophical foundations of neuroscience in organizational research: Functional and nonfunctional approaches. *Organizational Research Methods*, *22*(1), 299-331.

Bhaskar, R. (2013). *A realist theory of science*. Routledge.

Balthazard, P. A., Waldman, D. A., Thatcher, R. W., & Hannah, S. T. (2012). Differentiating transformational and non-transformational leaders on the basis of neurological imaging. The Leadership Quarterly, 23(2), 244-258.

Balthazard, P. A., & Thatcher, R. W. (2015). Neuroimaging modalities and brain technologies in the context of organizational neuroscience. In Organizational neuroscience (pp. 83-113). Emerald Group Publishing Limited

Baker, M., & Modell, S. (2019). Rethinking performativity: a critical realist analysis of accounting for corporate social responsibility. *Accounting, Auditing & Accountability Journal*, *32*(4), 930-956.

Barbour, J. B., & Lammers, J. C. (2015). Measuring professional identity: A review of the literature and a multilevel confirmatory factor analysis of professional identity constructs. *Journal of professions and Organization*, *2*(1), 38-60.

Becker, William J.; Cropanzano, Russell. Organizational neuroscience: The promise and prospects of an emerging discipline. Journal of Organizational Behavior, v. 31, n. 7, p. 1055-1059, 2010.

Becker, W. J., Cropanzano, R., & Sanfey, A. G. (2011). Organizational neuroscience: Taking organizational theory inside the neural black box. *Journal of Management*, *37*(4), 933-961.

Berger, P.; Luckman, T. A construção social da realidade. 20. ed. Petrópolis: Vozes, 1985.

Bourdieu, Pierre. O poder simbólico. 1989.

Butler MJR (2016) The embodied machine – Two factory case studies from Birmingham's Jewellery Quarter. Dissertation, MSt in the History of Design 2013–2015, University of Oxford. Oxford: University of Oxford, pp. 1–106.

Butler MJR (in press) Organizational cognitive neuroscience – Potential (non-) implications for practice. Leadership and Organization Development Journal.

Butler MJR and Senior C (2007a) Towards an organizational cognitive neuroscience. The Annals of the New York Academy of Sciences 1118(4): 1–17.

Butler MJR and Senior C (2007b) Research possibilities for organizational cognitive neuroscience. The Annals of the New York Academy of Sciences 1118(4): 206–210..

Butler MJR, O'Broin L, Lee N and Senior C (2015) How organizational cognitive neuroscience can deepen our understanding of managerial decision making: A review of the recent literature and future directions. International Journal of Management Reviews 18(4): 542–559.

Corbett, A., Cornelissen, J., Delios, A., & Harley, B. (2014). Variety, novelty, and perceptions of scholarship in research on management and organizations: An appeal for ambidextrous scholarship. *Journal of Management Studies*, *51*(1), 3-18.

Cornelissen, J., & Durand, R. (2012). More than just novelty: Conceptual blending and causality. *Academy of Management Review*, *37*(1), 152-154.

Davis, G. F. (2015). Celebrating organization theory: The after-party. *Journal of Management Studies*, *52*(2), 309-319.

De Certeau, Michel . Artes de fazer: a invenção do cotidiano. **Petrópolis: Vozes**, p. 41, 1994

Dimaggio, P. J. & Powell, W.W. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. American Sociological Review, 1983.

Dulebohn, J. H., Conlon, D. E., Sarinopoulos, I., Davison, R. B., & McNamara, G. (2009). The biological bases of unfairness: Neuroimaging evidence for the distinctiveness of procedural and distributive justice. *Organizational Behavior and Human Decision Processes*, *110*(2), 140-151.

Durand, R., & Thornton, P. H. (2018). Categorizing institutional logics, institutionalizing categories: A review of two literatures. *Academy of Management Annals*, *12*(2), 631-658.

Essén, a., & värlander, s. W. (2019). How technology-afforded practices at the micro-level can generate change at the field level: theorizing the recursive mechanism actualized in swedish rheumatology 2000–2014. *Mis quarterly*, *43*(4), 1155-1176.

Floyd, S. W. (2009). 'Borrowing'theory: What does this mean and when does it make sense in management scholarship?. *Journal of Management Studies*, *46*(6), 1057-1058.

Friedland, Roger; Alford, Robert R. Bringing society back in: Symbols, practices and institutional contradictions. 1991.

Friedman, Jared et al. Antagonistic neural networks underlying organizational behavior. In: Organizational Neuroscience. Emerald Group Publishing Limited, 2015. p. 115-141.

Fuenfschilling, L., & Truffer, B. (2014). The structuration of socio-technical regimes—Conceptual foundations from institutional theory. *Research Policy*, *43*(4), 772-791.

Gazzaniga, M. S. (2000). *The new cognitive neurosciences*. MIT press.

Geary, J., & Aguzzoli, R. (2016). Miners, politics and institutional caryatids: Accounting for the transfer of HRM practices in the Brazilian multinational enterprise. *Journal of International Business Studies*, *47*(8), 968-996.

Giddens, Anthony. **The constitution of society: Outline of the theory of structuration**. Univ of California Press, 1984.

Greenwood, Royston et al. Institutional complexity and organizational responses. Academy of Management annals, v. 5, n. 1, p. 317-371, 2011.

Hannah, S. T., Balthazard, P. A., Waldman, D. A., Jennings, P. L., & Thatcher, R. W. (2013). The psychological and neurological bases of leader self-complexity and effects on adaptive decision-making. Journal of Applied Psychology, 98(3), 393.

Healey, M. P., & Hodgkinson, G. P. (2014). Rethinking the philosophical and theoretical foundations of organizational neuroscience: A critical realist alternative. *Human Relations*, *67*(7), 765-792.

Jack, A. I., Rochford, K. C., Friedman, J. P., Passarelli, A. M., & Boyatzis, R. E. (2019). Pitfalls in organizational neuroscience: A critical review and suggestions for future research. *Organizational Research Methods*, *22*(1), 421-458.

Kahn, P. E. (2018). Renewing the professions by attending to structural influences on reflexivity: A critical realist perspective. *Journal of Professions and Organization*, *5*(2), 139-154.

Kilduff, M., Mehra, A., & Dunn, M. B. (2011). From blue sky research to problem solving: A philosophy of science theory of new knowledge production. *Academy of Management Review*, *36*(2), 297-317.

Lee N and Chamberlain L (2007) Neuroimaging and psychophysiological measurement in organizational research. Annals of the New York Academy of Sciences 1118(1): 18 42.

Lee N, Senior C and Butler MJR (2012a) The domain of organizational cognitive neuroscience: Theoretical and empirical challenges. Journal of Management 38(4): 921–931.
Lee N, Senior C and Butler MJR (2012b) Leadership research and cognitive neuroscience – The state of the union. Leadership Quarterly 23(2): 213–218.

Lindebaum, D., & Zundel, M. (2013). Not quite a revolution: Scrutinizing organizational neuroscience in leadership studies. *human relations*, *66*(6), 857-877.

Lindebaum, D. (2014). Ideology in organizational cognitive neuroscience studies and other misleading claims. *Frontiers in human neuroscience*, *8*, 2.

Lindebaum, D. (2016). Critical essay: Building new management theories on sound data? The case of neuroscience. *human relations*, *69*(3), 537-550.

Lounsbury, M., & Beckman, C. M. (2015). Celebrating organization theory. *Journal of Management Studies*, *52*(2), 288-308.

McLagan, P. A. (2013). A call to watch our paradigms!. *Journal of Management Inquiry*, *22*(3), 314-316.

Meyer, J. W., Rowan, B. Institutionalized organizations: formal structures as myth and ceremony. In: MEYER, J. W., SCOTT, W.R. Organizational environments ritual and rationality. London : Sage, 1992. p. 41-62.

Meyer, John W.; Rowan, Brian. Institutionalized organizations: Formal structure as myth and ceremony. American journal of sociology, v. 83, n. 2, p. 340-363, 1977.

Minas, R. K., Potter, R. F., Dennis, A. R., Bartelt, V., & Bae, S. (2014). Putting on the thinking cap: using NeuroIS to understand information processing biases in virtual teams. *Journal of Management Information Systems*, *30*(4), 49-82.

Moses, A., & Sharma, A. (2020). What drives human resource acquisition and retention in social enterprises? An empirical investigation in the healthcare industry in an emerging market. *Journal of Business Research*, *107*, 76-88.

Nigam, A., & Ocasio, W. (2010). Event attention, environmental sensemaking, and change in institutional logics: An inductive analysis of the effects of public attention to Clinton's health care reform initiative. *Organization Science*, *21*(4), 823-841.

Ocasio,W. 1997. Towards an attention-based view of the firm. Strategic Management J. 18(S1) 187–206.

Ocasio, William. Attention to attention. Organization Science, v. 22, n. 5, p. 1286-1296, 2011.

Okhuysen, G., & Bonardi, J. P. (2011). The challenges of building theory by combining lenses.

Oswick, C., Fleming, P., & Hanlon, G. (2011). From borrowing to blending: Rethinking the processes of organizational theory building. *Academy of management review*, *36*(2), 318-337.

Ravaja, N., Somervuori, O., & Salminen, M. (2013). Predicting purchase decision: The role of hemispheric asymmetry over the frontal cortex. *Journal of Neuroscience, Psychology, and Economics*, *6*(1), 1.

Saad, G. and Vongas, J.G. (2009). The effect of conspicuous consumption onmen's testosterone levels. Organizational Behavior and Human Decision Processes, 110, pp. 80–92.

Senior, C., Lee, N., & Butler, M. (2011). PERSPECTIVE—organizational cognitive neuroscience. *Organization Science*, *22*(3), 804-815.

Senior, C., & Lee, N. (2013). The state of the art in organizational cognitive neuroscience: the therapeutic gap and possible implications for clinical practice. *Frontiers in human neuroscience*, *7*, 808.

Smink, M., Negro, S. O., Niesten, E., & Hekkert, M. P. (2015). How mismatching institutional logics hinder niche–regime interaction and how boundary spanners intervene. *Technological Forecasting and Social Change*, *100*, 225-237.

Suddaby, R., Hardy, C., & Huy, Q. N. (2011). Where are the new theories of organization? Introduction.

Tharawadeepimuk, K., & Wongsawat, Y. (2017). Quantitative EEG evaluation for performance level analysis of professional female soccer players. *Cognitive neurodynamics*, *11*(3), 233-244.

Tietema, Y. (2019). How do employees in activity-based work environments keep their attention? A neuroscientific perspective on selective and sustained attention. *GEDRAG & ORGANISATIE*, *32*(3), 181-208.

Thornton, Patricia H. Markets from culture: Institutional logics and organizational decisions in higher education publishing. Stanford University Press, 2004.

Thornton, Patricia H.; Ocasio, William; Lounsbury, Michael. The institutional logics perspective. John Wiley & Sons, Inc., 2013.

Tracey, P., Phillips, N., & Jarvis, O. (2011). Bridging institutional entrepreneurship and the creation of new organizational forms: A multilevel model. *Organization science*, *22*(1), 60-80.

Waldman, David A. et al. A neurological and ideological perspective of ethical leadership. Academy of Management Journal, v. 60, n. 4, p. 1285-1306, 2017.

Waldman, D. A., Balthazard, P. A., & Peterson, S. J. (2011). Social cognitive neuroscience and leadership. The Leadership Quarterly, 22(6), 1092-1106.

Weber, M. (1978). *Economy and society: An outline of interpretive sociology* (Vol. 1). Univ of California Press.

Zucker, Lynne G. (1977) Normal Change Or Risky Business: Institutional Effects On The ‘Hazard’of Change In Hospital Organizations, 1959–79 [1]. Journal of Management Studies, v. 24, n. 6, p

Zuckerman, E. W. (1999). The categorical imperative: Securities analysts and the illegitimacy discount. *American journal of sociology*, *104*(5), 1398-1438.

# 4. CHAPTER 3 – ORGANIZATIONAL COGNITIVE NEUROSCIENCE: WHICH PATH SHOULD I TAKE? A GUIDE TO START THE JOURNEY TOWARDS A NEUROINSTITUTIONAL PERSPECTIVE

## 4.1 INTRODUCTION

Management and Organizational scholars are continually seeking innovative ways to understand organizations. Recently, a cognitive neuroscience turn started to rise and the number of scholars advocating the use of neuroscience methods and concepts to understand organizational behavior is increasing (i.e., Ashkanasy et al, 2014; Balthazard & Tatcher, 2015; Becker & Copranzano, 2010; Butler & Senior, 2007; Butler, 2017; Waldman et al, 2011).

Some debates having been traced about the implications of adopting a neuroscientific perspective to explain organizational function. Lindebaum (2013) and Lindebaum and Zundel (2013), for instance, question the risk of reductionism, once, according to them, it is impossible to explain high-level phenomena through low-level explanations and, apparently, there is no logic in explaining social complex phenomena reducing it to the brain level. On the other hand, some scholars replied to those critics. For example, Healey and Hodgkinson (2014) proposed the adoption of critical realism as a philosophical foundation to support organizational neuroscience. In turn, Butler (2017) provided a clarification about the organizational cognitive neuroscience (OCN) assumptions, explaining that one of the major goals of OCN is the multi and interdisciplinarity character and the concern about context positioning this perspective far away from the anti-reductionism critics. I believe that neuroscience can contribute to the debate about organizational life once it provides an extra layer for human behavior understanding: the individuals' brain.

Despite the crescent debate and number of scholars in favor of the adoption of an OCN perspective, the number of empirical articles is growing slowly. It will be precipitated and a mistake if we affirm that organizational cognitive neuroscience is failing as a promised field capable of revolutionizing the management and organizational field based on the small number of empirical work. Although other areas such as marketing and economics have already been applying neuroscience in the studies, it is still an unknown new ground for many management and organizational scholars and much yet must be done to improve the field and encourage scholars to board on OCN ship.

Recently, Jack et al (2019) discussed the ability of scholars in working with neuroscience and, through an analysis of the work done so far, warned about the necessity of

learning how to draw appropriated inferences from neuroscience studies and make studies that can really contribute to organization studies proposing four design elements to help the construction of solid reverse inferences. Albeit their work provided an important contribution to those scholars who wish to use OCN in their studies, it is still necessary specific guides that can offer more detailed possibilities of research.

I am aware of the difficulty in applying neuroscience methods in organizational studies – i.e., cost, accessibility, and ethical issues. Besides that, the lack of intimacy of organizational and management scholars with neuroscience methods may also be one of the obstacles to the field's growth. Because of that, it is necessary an endeavor to clarify the possibilities of the OCN perspective adoption through a guide of the methods available, how to use it and how it can contribute to enhancing specifics theory knowledge. It is already known that blending management and organizational theories with OCN leads to the rise of a promising new field. Nevertheless, the growing number of articles debating the pros and cons of adopting a neuroscientific perspective to understand the organizational life and the small number of empirical articles highlights that: is no longer a matter of if it is possible, but a matter of how to do it.

In an attempt to fill that void, I opted for presenting a guide of methods for those who want to blend the Institutional Logics Perspective with the OCN perspective. But why combine specifically the institutional logics perspective with neuroscience? Approaching these fields is a way to fill gaps and limitations inherent to both perspectives. Putting institutional logics and organizational cognitive neuroscience together opens a gate to expand our knowledge about the influence of material and symbolic practices on individual actors and groups' cognition. The use of neuroscientific methods combined with other methods already used in institutional theory studies – including qualitative and interpretative ones - sounds promising to promote novel and innovative explanations to phenomena already under studies and phenomena still unexplored.

In an attempt to blend institutional logics with OCN, I propose a Neuroinstitutional perspective. It is already known that cognition influences individual and organizational action and it has been the focus of interest of many areas, including institutional logics perspective and OCN. This proposal seeks to add the micro aspects of institutions – e.g.: cognition, attention, emotion, behavior, social interaction – in a novel way that could help the development of a more holistic view about the dynamics of organizational life. Even with an extensive range of challenges, the institutional logics perspective is a fast-growing stream of research (Durand & Thorton, 2018) and linking it with OCN can bring mutual enrichment

revealing nuances unobserved and new sources of explanation to social and organizational phenomena at all levels, including what happens inside the managers "black box".

Besides of blending both perspectives, the present study aims to go beyond presenting a methodological guide to scholars that want to engage in an endeavor of using OCN to understand better the influences of institutional logics on individual actor and, consequently, on organizational life.

Firstly, I briefly conceptualize both perspectives. Secondly, I present the neuroinstitutional perspective and a guide of how to put it in practice showing the most common neuroscientific methods used by management and organizational scholars and other methods available and how to use those methods combined with methods already used to study institutional logics perspective. After that I discuss the implications of the adoption of OCN to better understand the institutional logics microfoundations and I conclude with limitations and suggestions for future research.

## 4.2 INSTITUTIONAL LOGICS PERSPECTIVE

The definition of institutional logics has its roots in the works of Social Sciences scholars. But it was the study of Friedland and Alford (1991) that presented a better understanding of this perspective. According to the authors, institutional logics correspond to a "set of material practices and symbolic constructions" present in a field (Friedland & Alford, 1991, p.218).

These logics have a symbolic character and influence the organization of institutional arrangements. Institutional logics can be described as a set of principles that drive the organizational perception of reality, defining appropriate behavior and the ways to achieve sustainable success. Thus logics, sometimes mutually incompatible, guide interpretation and action in social situations (Thornton, 2004; Greenwood et al., 2011).

Friedland and Alford (1991) advocated the existence of central logics that restrict the meanings and purpose of individual and group behavior, providing sources of action and change constituting individuals, organizations, and society. These central logics are the capitalist market, bureaucratic state, family, democracy, and religion. Later, Thorton and Ocasio (1999) integrated into their perspective three necessary and complementary dimensions of institutions: structural, normative and symbolic.

Even being an alternative to traditional concepts of institutional theory, institutional logics preserve some ideas present in the foundations of Meyer and Rowan's (1977), Zucker's

(2007) and DiMaggio and Powel's (1993) neoinstitutionalism. Both perspectives share concerns related to culture and cognition and its influence on organizational structures. Nevertheless, there is an important difference related to the similarity of organizational structures and processes adopted. Institutional logics shed light on the relationship between these logics, individuals and organizations to comprehend the differences and variations in the environment instead of focus on isomorphism and convergent change.

The organizational behavior cannot be interpreted without situating it in society. Thus, different from the neoinstitutionalism, institutional logics go beyond the field boundaries. Society is permeated by independent multiple institutional logics that, sometimes, can be contradictory. Those logics compete for a greater influence in the different domains of society. Besides that, the same logics can be present in different fields formed by a group of actors operating in the same domain. Their actions are guided by the same set of logics providing resources or constraining the actors' actions and goals. Once those logics often are in conflict, its systems of meaning and normative understanding which are built from rituals and practices can foment conflicting expectations in the organizational, group and individual actors' life (Friedland & Alford, 1991; Nigam & Ocasio, 2010; Greenwood et al, 2011).

Institutional logics perspective highlights the importance of considering individual behavior and cognition which is affected by symbolic and material practices bringing consequences to organizational behavior and action. Therefore, to comprehend institutions' influence on individual cognition and behavior is necessary to understand how institutions shape interest, independently of the individual or organization. Friedland and Alford's (1991) argument about the importance of bringing the societal contents to individual and organizations behavior presenting the basic assumptions to develop a theory of levels of institutions that connect **internal mental cognitions** to rituals and external social stimuli. This theory of levels of institutions is conceptualized through institutional orders - subsystems that form the institutions, which, in turn, are composed of categories that form an interinstitutional system. These categories represent the cultural symbols and material practices particular to each order that will shape the individual and organizational interests and preferences and the behavior by which interests and preferences are achieved within the sphere of influence of a specific institutional order (Thorton, Ocasio, Lounsbury, 2013).

Once the reaction to institutional logics depends on individuals and organization interpretation, the role of agency and structure must be considered to obtain a more in-depth explanation of the influence of logics on organizational life.

The institutional logics perspective turns eyes to the importance of individual agency – the ability to intervene in situations, even it is not intentional. Individual action is more than simply intending of doing something. Giddens (1984) points out that acting goes beyond only intending of doing something, it is about being relevant in its occurrence once the action is related to the agents' ability to give something different for something that already exists. The intentionality of the agent cannot be denied nor consider as being the main characteristic of the agency capacity. Although any action has as its starting point an intention, its result cannot be explained exclusively based on intention, but rather when unintended consequences are recognized. These ideas represent the notion of limited rationality once, although the institutional patterns constraint the rational ability of action, these same patterns enable the action (Giddens, 1984; Thorton & Ocasio, 1999).

The logics plurality demands interpretation by individuals, who will construct meanings culminating in action and choice, giving institutionalization a dynamic character. Even when organizations and individuals adopt and reproduce patterns socially acceptable, it will not correspond to copies, but subjected to interpretation and actions according to the context in each organization is embedded.

Thorton, Ocasio and Lounsbury (2013), recognizing the importance of agency to the institutional logics responses, developed an integrative model of microfoundations: A Model of Human Behavior. They based this model on the rational choice theory and structural determinism from psychology and sociology.

### 4.2.1 Microfoundations of Institutional Logics

The Cross-Level Model of Institutional Logics (Thorton et al 2013, p.85) shows the interrelationships between macro, meso and micro level of analysis. The individual actor gains relevance once embedded agency and institutional contradictions are the basis of the microfoundations. Besides that, as can be seen in figure 4, other concepts related to human behavior appear in the model: institutional logics drives the individual actors' and organizations' focus of attention through cultural incorporation, activating identities, objectives and action plans.

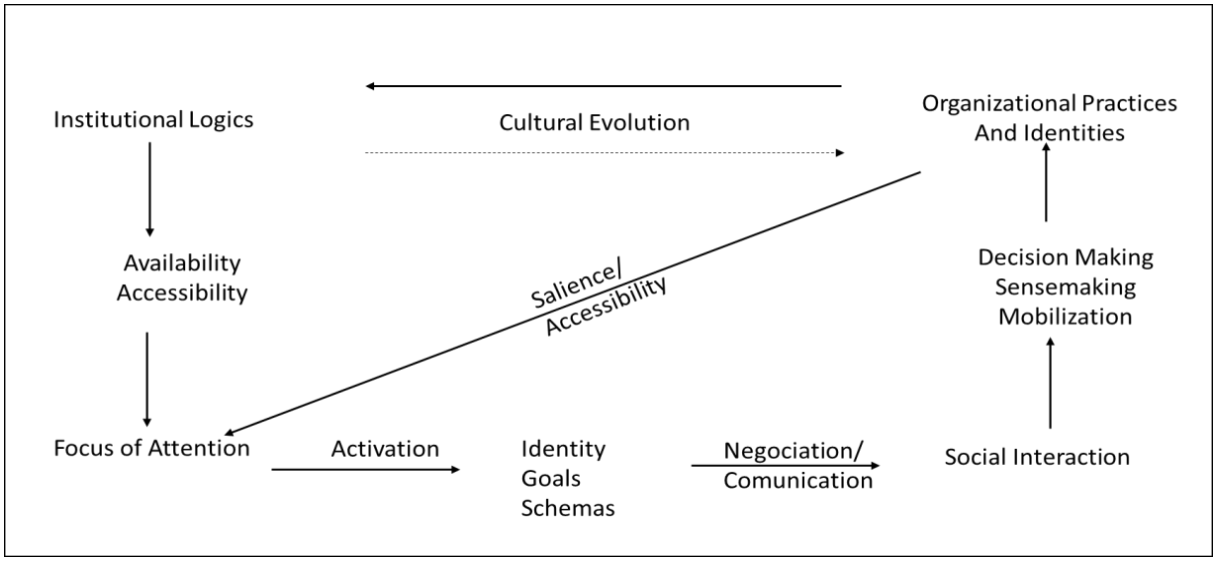


Figure 4: A Cross-Level Model of Institutional Logics Combining Macro-Micro and Micro-Macro. Adapted from Thorton, Ocasio and Lounsbury (2013, p.85)

As can be observed in figure 4, the Cross-level Model demonstrates a predominance of the role of agency, human behavior, interpretation and evolution and change of institutional logics. The agency is guided by social identities and identification and allows individuals to search for the satisfaction of individual needs and self-interest.

Besides the multiple identities, individuals and organizations have multiple and, sometimes, conflicting goals which will guide cognition and action in a variety of situations and domains. Those conflicts between goals are, often, unsolved and will be activated through the processes responsible for guiding the focus of attention. According to the Institutional Logics perspective, goals, as well as social identities, are culturally incorporated within alternative institutional logics affecting individual cognition and action. Often goals are not congruent with individual's identities. Institutional logics help social actors construct structures or schemas aiming to shape attention, interpretation, inference and problem solving (Thornton, Ocasio, Lounsbury, 2013).

However, it is important to consider the difficult inherent to individuals related to their ability in allocating cognitive resources for information processing (focus of attention) to any environmental stimulus and response to actions. In an attempt to solve this limitation, organizations create structures and processes for shape and drive the focus of individual and/or group's attention. Allocation, or the focus of attention, is guided by the institutional logics that shape the problems and issues that must be addressed, and the possible solutions to these issues,

limiting action and cognition of the individual directly related to decision-making processes (Ocasio, 2011; Thorton, Ocasio, Lounsbury, 2013).

There are studies concerned with the allocation of cognitive resources and its consequences to the organizational adaptation (Thorton and Ocasio, 1999; Lounsbury, 2007; Thorton, Jones and Kury, 2005; and Cho and Hambrik, 2006). However, those studies are more focused on the role of institutional logics and organizations in a top-down process. There is a lack of studies concerned with bottom-up environmental stimuli considering that not always individual and organizations will face situations where existing schemas agree with behaviors and outcomes observed in the environment. In some situations, the bottom-up stimuli will not always be attended to. Instead, it is contingent on the salience of the stimulus.

Besides that, more studies that demonstrate the interrelationship between these two processes are welcomed since most research focuses on the institutions and organization guiding attention: top-down processes. However, research has also shown that attention, and consequently, action is guided by objectives, task demands, and prior cognitive orientations that lead to automatic responses suggesting the importance of the bottom-up process (Ocasio, 2011). In addition, the author talks about the importance of research that addresses a multilevel analysis that demonstrates the relationships between individual cognition and organizational attention.

Combining the institutional logics perspective with organizational cognitive neuroscience is a promising way to enhance the understanding of the interrelationship between levels of analysis in a deeper and innovative way. The next session presents the OCN and its use in organizational studies.

## 4.3 ORGANIZATIONAL COGNITIVE NEUROSCIENCE

The use of neuroscience in the social sciences has been increasing in economics, political sciences, law, sociology and social psychology. This growing interest is due to the existence of a variety of ways and levels to understand the human brain: molecular, cellular, systemic, and behavioral. Behavioral neuroscience, for instance, includes disciplines as neuroeconomics and neuromarketing, which link brain activities to reputation, status, cooperation, trust and altruism (social neuroscience), learning, perception, memory and decision making (cognitive neuroscience) and feelings, passion, emotion and motivation (affective neuroscience) (Powell, 2011).

The organizational cognitive neuroscience (OCN) is a new perspective that rose to apply cognitive neuroscience methods to better understand the organizational phenomena (Butler, 2016). Butler and Senior (2007) first defined OCN as the study of processes inside the brain that are the basis or that influence human decisions, behavior and interaction a) within organizations or b) in response to organizational manifestations or institutions.

Later, Senior and Butler (2011, p. 805) considered that definition incomplete once its focus was restricted to the brain. A better definition of OCN would also include the interaction between brain processes and cognitive mechanisms mediating the human behavior responses to organizational manifestation and institutions. In other words, OCN goes beyond the simple application of neuroscience methods.

The OCN has its roots based on social cognitive neuroscience and can be considered one of its applied forms. It is important to recognize that OCN is a multidisciplinary approach in terms of theory and methods. Its assumptions were built to blend with management and organizational perspectives and theories in order to understand it better and enhance the field through a combination of methods and perspectives (Butler, 2016).

Despite the critics of some scholars about reductionism and if neuroscience can really contribute to organizational studies (see Lindebaum, 2013a, 2013b, 2014a, 2014b, 2016; Lindebaum & Zundel, 2013) one of the major OCN concerns is the importance of context in the analysis in order to use neuroscience effectively to amplify the understanding of the organizational phenomena. Ashkanasy et al (2014) advocate that, if the researcher is aware of the context, the use of neuroscience in organization studies can bring a new perspective to elucidate one of the oldest controversies related to organizational behavior: the interrelations between the individual and the context and how one influences the other.

Even though some recent studies have shown the relevance of using cognitive neuroscience to better understand and improve current theories and models of organizational situations (Hanna et al, 2013; Waldman & Balthazard, 2015; Friedman et al, 2015; Waldman et al, 2017), those studies did not consider the context in its inquiries. By doing so, researchers take the risk of present analysis about brain activities and neurological responses different from those who made under a certain context. Butler and Senior (2011) point out that bringing neuroscience to organizational studies cannot be resumed of brain activities being analyzed as basic building blocks isolated from its context. This is the reason that I advocate the combination of OCN with theories and perspectives that are always studied considering the context in which organizations, groups and individual actors are inserted, in the case of the present study, the institutional logics perspective.

As well as it is not advisable to conduct top-down organizational research without considering the existence of cognitive and neural systems of groups and individuals, it is also difficult to conduct bottom-up research considering only brain activity and neurological responses without considering the role of the context in which individual, groups and organizations are part. Thus, according to Senior and Butler (2011, p.806) "where there are competing theories of the same organizational phenomena, the organizational cognitive neuroscience approach may be able to provide more convincing evidence to determine which one is the more accurate explanation". Just as organizational research informed by top-down and bottom-up perspectives can deepen our understanding of organizational research problems, the same might be said of using approaches that consider the underlying brain systems and cognition.

Although the field of OCN has evolved, especially in economics, marketing and organizational behavior, Butler et al. (2017) highlights the importance of more empirical research to consolidate the field. There are varieties of topics being addressed in OCN that claim for more research that enrich the body of knowledge. Management and organizational studies offer a vast field of research to develop the use of neuroscience to understand organizational phenomena.

The authors also claim for the use of more varied neuroscientific methods. Research in economics and marketing uses mostly hormone levels (Zyphur et al., 2009; Saad & Vongas, 2009; Apicella et al., 2008; Coates et al., 2009) or neuroimaging techniques (Boyatzis et al., 2012; Krueger et al., 2009). Research in organizations offers a more extensive variety of methods, including qEEG (Balthazard et al., 2012; Hanna et al., 2013; Minas et al., 2014; Peterson et al., 2008; Waldman et al., 2011), facial morphology (Spisak et al., 2012; Wong et al., 2011), and fluctuating asymmetry – the extension of asymmetry between right and left side of the body – (Senior et al., 2012). However, more research is needed to give coherence to OCN studies using a variety of combinations of methods and perspectives.

## 4.4 THE NEUROINSTITUTIONAL PERSPECTIVE – HOW TO PUT IT IN PRACTICE

Before start talking about the methods available and how to incorporate it to the institutional logics perspective, I would like to clarify why blending OCN with institutional logics seems a promising new field for a better understanding of the influence of symbolic and material practices in individual, group and organization behavior and action.

Adopting an OCN perspective means to embrace its multidisciplinary character. Cognitive neuroscience is a bottom-up approach, while organizational science has, predominantly, a top-down character. Combining those two perspectives allows a multi task team of researchers to answer questions not yet addressed or providing a new view for conflicting explanations about organizational phenomena (Butler & Senior, 2011; Senior et al, 2015). This is why I believe that blending OCN with institutional theory makes it possible to build strong and robust explanations under both perspectives: top-down and bottom-up.

As I mentioned above, the institutional logics perspective positioned the social actor in a relevant baseline to understand the influence of a constellation of logics in organizational behavior (Friedland & Alford, 1991). Cognition and action gain a vital role in the Cross-level model of the microfoundations so as the interplay between the three levels: society, organizations and individuals. Despite the autonomy of these levels, they are interdependent, and individuals are constantly competing and negotiating (Friedland & Alford, 1991). Focus of attention, decision making processes, sensemaking and interaction are influenced by institutional logics, which also are affected and even changed.

I believe that a combination of methods can promote a broader and deeper understanding of the influences of material and symbolic practices on the organizations and individuals and, at the same time, the role of the individual in the change and evolution of those practices. Using OCN to study institutional logics allows a comparison between what is being observed by researchers and said by participants and what is happening in their brains.

### 4.4.1 Neuroscience Methods and Organization Studies: An Overview

I recognize the importance of the work done so far which demonstrated the contributions that cognitive neuroscience can bring to organization studies. However, it is important to acknowledge that most management and organization scholars have no intimacy with neuroscience, the methods available and how to apply it in the organizational context. When a researcher decides to adopt OCN to understand organizational phenomena, it is important to define which method is more suitable for the phenomena they want to study. There are a variety of methods already used in marketing and economic studies and, in a smaller number, organization studies. In an attempt to guide those who want to blend OCN with Institutional Logics towards a Neuroinstitutional perspective, I, firstly, present the methods available as well as their advantages and limitations. It is important to mention that I do not cover all methods in-depth, but it is the first step for researchers to have a first contact with the

range of techniques available. After that, I suggest the methods – not only from neuroscience but also from the ones used in organization studies - that I consider suitable to better understand the microfoundations of institutional logics.

According to Jack et al. (2019), methods in neuroscience can be separated into two categories: methods that can measure and observe neuronal structure and function and methods that interfere with neural processes and functions.

Table 1 summarizes the human neuroscience methods available, some of those largely used in cognitive neuroscience, its strengths and limitations of being used in organizational studies, invasiveness and safety, level of cost, and some studies that already applied the techniques. I summarized not only methods that can directly measure cortical response, but also, other alternatives such as video recording, EDA and eye gaze that, combining with other methods can provide broader and more complete analyzes.

Some of those methods are already being used in OCN studies, however, it is necessary more empirical studies to analyze its functionality and applicability to explain organizational phenomena. When choosing a neuroscience technique for a given study, the researcher must be aware to some criteria such as invasiveness/safety, costs, possibility of studying the real world and spatial and temporal resolution. The differences between spatial and temporal resolution result in different views of brain function and it is connected with the type of inferences and results that the researcher is seeking. Senior et al (2015) highlight that a researcher unpracticed in neuroscience may think that increasing temporal and spatial resolution will result in better results and convergent explanation when opting for more than one technique combined. Stewart and Walsh (2006) clarify that this does not apply, necessarily, to all situations. The researcher must be careful to guarantee the implications of the modality chosen for the research question that will be answered.

Table 1: *Overview of Human Neuroscience Methods*

| Method | | Description | Invasiveness/safety | Strengths | Limitations | Cost (in comparison with typical social science methods) |
|---|---|---|---|---|---|---|
| Scan | CT | Computerized tomography (CT scan) is a structural (morphological) imaging technology that combines X-ray measurements from different angles through a computer process to create cross-sectional images of a specific area | - | Despite its traditional use in clinical settings, it's a very expensive and invasive method which disqualify its use for organizational studies. | Risk of exposing the patient to ionizing radiation. The confining nature difficult the study of real settings and even experimental. Lack of accessibility | High |
| /SPECT | PET | Position Emission Tomography (PET) and Single Photon Emission Computed Tomography (SPECT). Used for metabolic function of the brain measurement. Isotopes provide a PET tracer that measures blood flow indicating brain activity. | -- | Cost relatively low, in comparison with other techniques. Possibility of a variety of behavioral analysis, including attention, depression and emotions. | These methods lack in temporal resolution. The short life of tracers difficult a robust data collect. Besides that, the invasive character may difficult ethics committee approval for organizational studies | Low if compared with other techniques. |
| I | fMR | Functioning Magnetic Resonance Imaging (fMRI) based on vascular and neural activities acting on the magnetic properties of hemoglobin. Blood flow is changed by neural activities. | ? | It is possible to measure activities in the entire brain providing a broad foundation for inferences about brain activity integrating different regions of the brain. Best spatial revolution. | Poor temporal resolution. Studies are limited to tasks that can be performed at a scanner. It is not possible to capture the real life of organizations. | High |
| RS | fNI | Functional Near Infrared Image measures local changes in cerebral hemodynamics | | High temporal resolution and possibility to use portable devices | | High |
| G | qEE | Electroencephalograph (EEG) shows the electrical activity of the brain cells. | + | Its use involves no health risks and is much less expensive than other modalities. One of the advantages of the EEG is because the individual can do various tasks, | Measuring can be influenced by others electrical currents. Cannot spatially localize activity in the manner that fMRI or PET can. | low if compared with other techniques. |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | | | | | facilitating the study of behavior within organizations, especially because of its strong temporal resolution. | | |
| LORETA | | Low resolution brain electromagnetic tomography is a technique capable to localize electral activity in the brain from the surface of the scalp. | | ? | Even not being a precisely source of information about brain activity it is possible to capture an approximate determination of the distribution. | In order to consistent findings, must be combined with other methods such as fMRI. | High considering the necessity of combination with other techniques. |
| MEG | | Magnetoencephalography measures brain activity through the quantification of magnetic fields in the brain that appear from electrical currents. | | ? | Superior accuracy and reliability if compared with other methods, including EEG. | High cost, demands a quiet place due its sensibility to external noise, not portable, difficulting capture real situations. | High |
| Video recordings | | However, no measuring cortical response or neural activities, recording organizational set allows the use of software capable to measure emotion, through facial expressions, and behavior, through body language. | + | + | Allows the analyze experiments and real word situations of an individual or a group. Good temporal resolution. | Applicability. It is necessary one camera for individual in order to capture facial expressions. | Low if compared with other techniques. |
| EDA | | Electrodermal activity - measures the activity of the sweat glands in the hands, that is, if the hands perspire, suggests the existence of an emotional stimulation measuring (usually in micro-Siemens or micro-Mho) the conductivity of the skin when in contact with an electrode. | + | + | Easy to use, allowing, for example, studies of decision making in real time and real world, not being restrict to experiments. Good temporal resolution | Can only be used to measure psychophysiological differences at the system level | High |
| Eye Tracker | | Glasses that produce gaze path video | + | + | It is possible to gather large quantities of rich data related to attention and emotion. | May be necessary a combination with other techniques to obtain relevant information to organization studies | High, considering the necessity of acquire the equipment |

-- Unacceptable; - Poor; ? Questionable; + Good; ++ Best/Preferred

Although CT scan is a technique that has been largely used for clinical purposes, adapting it to organizational studies can be a challenge due to its cost and invasiveness. Besides the risk of exposing individuals to ionizing radiation, I have to add the confining character, which is challenging to analyze in real settings. Also, it is impossible to analyze group situations, restricting the studies to experiments with one individual each time.

The same can be said about PET/SPECT. In this technique, the measurement of blood flow is made by an injection of a radioactive tracer in the blood stream (Raichle, 1998). Even presenting a low cost if compared with other techniques, its invasiveness can be an obstacle to researchers, especially related to difficulty in finding participants for the study and ethical issues – I believe that most ethical committees may question the real necessity of submitting individuals to radioactive tracers via injection or inhalation. According to Kable (2011), the use of PET/SPECT in cognitive neuroscience is decreasing, especially with the development of fMRI which presents a number of advantages over PET/SPECT. Using PET/SPECT, the number of measurements in a given person is restricted due to radioactivity, which does not happen with fMRI.

Besides the fact that fMRI does not involve the use of radioactivity, it has a better spatial and temporal resolution. However, special care must be taken in order to avoid the "so what?" question when a study that applied this technique is finished. I recognize that, because of the "neuroscience fever" in organization studies, researchers must be tempted to use fMRI in order to innovate in their studies. But I need, following Senior et al (2015), to aware scholars who wish to adopt fMRI that the results, in some cases, can be superficial and, even, reductionist. For instance, I do not consider it reasonable to use a relatively invasive and expensive procedure only for measuring how different areas of the cortex are activated when a manager is making a decision or solving a problem. Furthermore, this method allows one person at a time inside the brain scan which limits what the study can cover, for example, social interaction. Even with the mentioned limitations, fMRI has been applied in several studies of organizational phenomena, especially to answer questions related to leadership and decision-making (i.e., Rule et al, 2011; Boyatzis et al, 2012; Becker & Menges, 2013; Jack et al, 2013(a); Jack et al, 2013 (b); Sheepers et al, 2013; Molenberghs et al, 2017; Rybnicek et al, 2019).

Electroencephalography (EEG) is a technique that shows the electrical activities from cortical regions through electrodes that are placed on the scalp (Handy, 2005). This technique has a good temporal resolution being ideal for studies that need to capture phenomena that can only be obtained in the real world of organizations once it is able to record activities that occur quickly, such as focus of attention or creative insights during meetings or decision-making

processes. Normally, studies that adopt EEG average the time-locked responses to many repetitions of stimuli. Then, the event-related potential (ERP), which is the spatial and temporal profile of this average response is analyzed. Statistical techniques can be used to decompose the ERP to investigate varying responses on single trials. Besides that, EEG can also be adopted for measuring changes in oscillatory activity related to task performance (Kable, 2011).

Another important advantage of EEG is the possibility to examine a group of individuals, being a good option for those who desire to study social interaction. EEG is less expensive and more available then other techniques, such as fMRI. The evolution of this technique allows the researcher to collect data directly in the real setting where organizational phenomena happen. Portable devices can be used during the daily tasks, meetings and other situations of organizational life which enriches the analysis once the individual does not need to be removed from the context being restrict to a laboratory. Figure 6 and 7 show examples of one of those devices which can be used not only for measuring but also for brain training.

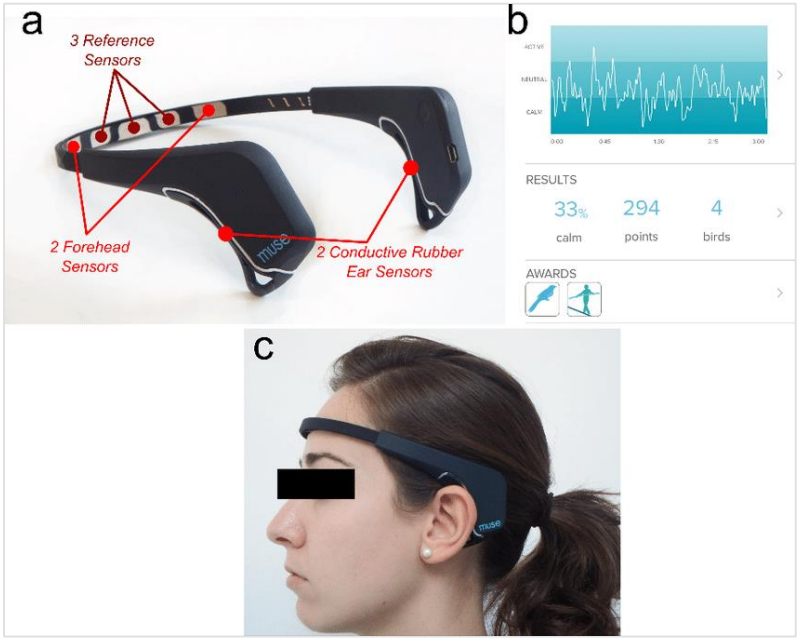


*Figure 5*: the muse™. A wearable device, a commercial brain-sensing headband. Uses electroencephalographic (eeg) frequency data to provide the user with real-time acoustic feedback on his/her oscillatory brain activity. (a) the wearable device. Red dots mark the position of embedded eeg dry sensors; (b) an example of a post-session feedback screen; (c) placement of the brain-sensing headband. (balconi, 2017).

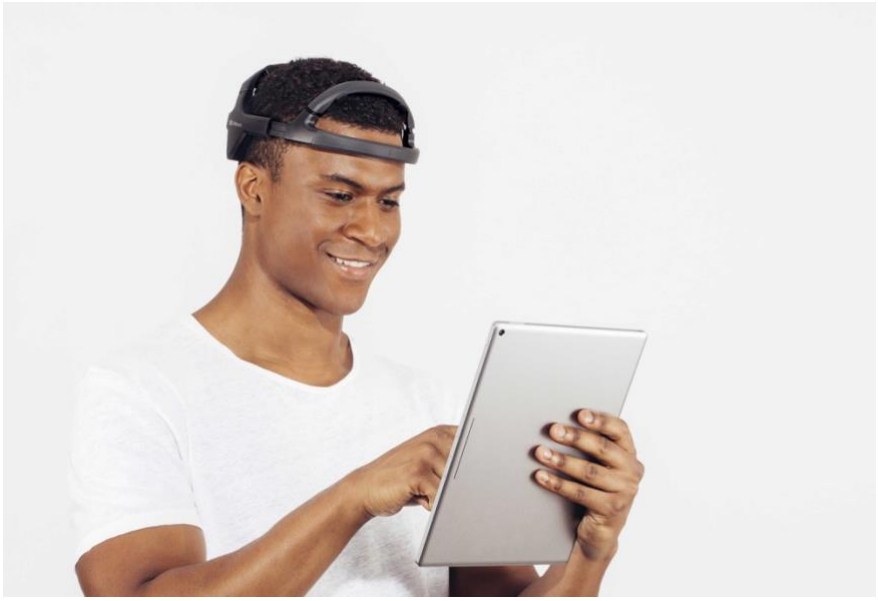

*Figure 6*: BitBrain Diadem. Wearable and mobile dry-EEG headset with 12 channels over pre-frontal, frontal, parietal and occipital brain areas, optimised for the estimation of emotional and cognitive states.

As well as the other techniques, EEG has limitations. Measuring can be influenced by other electrical currents. Besides that, according to Michel et al (2004), EEG cannot determine the spatial location of the activity like fMRI or PET scan. Once EEG measures electrical activity at the scalp, it is a problem to precisely determine what configuration of brain sources could led to the obtained data.

Low resolution brain electromagnetic tomography (LORETA) is an extension of EEG and can be capable to estimate the location of an activity. Even not being a precise source of information about brain activity it is possible to capture an approximate determination of the distribution. However, it works better if combined with other methods in order to achieve more consistent findings once measures obtained from the scalp do not provide precisely the exact three-dimensional distribution of activity inside the brain (Balthazard & Tatcher, 2015).

Magnetoencephalography (MEG) measures brain activity through the quantification of magnetic fields in the brain that appear from electrical currents. If compared with other techniques, MEG presents superior accuracy and reliability. However, besides the high cost, MEG is not portable and demands a quiet place due to its sensibility to external noise, which difficult to capture in real situations.

Although not being a technique based on cortex measuring, video recordings have been growing in cognitive neuroscience studies. The study of human behavior and emotion using neuroscientific technics is becoming popular in the sciences like psychology, psychiatry

and other neurology departments. According to Nevile (2015), to analyze the natural course of a social interaction considering its context and real time, researchers have relied on transcriptions from audio and, increasingly, on video-recordings. Hopper (1990) points out that when the researcher uses video recording combined with transcriptions, the analysis becomes alive and enriched once it captures more nuances of the context where the social interaction happened. There is a variety of softwares specialized in decoding those information that can, also, be combined with other neuroscientific techniques allowing analysis comparing individual and group behavior.

Electrodermal activity (EDA) is another technique that does not obtain information from the cortex but can be useful and relevant for studies carrying an OCN perspective due to its ease of use. EDA measures the activity of the sweat glands in the hands, that is, if the hands perspire, suggests the existence of an emotional stimulation measuring (usually in micro-Siemens or micro-Mho) the conductivity of the skin when in contact with an electrode. EDA is formed by two components: electrodermal level and electrodermal responses. The electrodermal level is changed in sweat glands related to slow spontaneous electrical fluctuations caused by the interaction between tonic discharges of sympathetic innervation and skin temperature and hydration. Electrodermal responses corresponds to phasic sympathetic nervous discharges (Sequeira et al, 2009). This technique can be used, for instance, in studies of decision-making and social interaction (i.e., Zander et al, 2017; Bjorhei et al, 2019; Christopoulos et al, 2019; Kraig et al, 2019) in real time in the real world and has a good temporal resolution.

Finally, Eye Tracker is a technique that uses a pair of glasses that produce path video to study attention and emotion once it produces a large of rich data. Already used in marketing studies, in combination with other methods such facial expression analyses and even EEG, it is possible to explore a large number of organizational phenomena (see: Khushaba et al, 2012; Nermend, 2017; Audrin et al, 2018; Jia & Tyler, 2019; Hayashi et al, 2020).

As shown above, there are many different modalities of techniques used in cognitive neuroscience that can be transposed to management and organization studies through the adoption of an OCN perspective. And in order to guarantee the accomplishment of the OCN premises, I highly recommend the combination of these perspectives with management and organizational theories and perspective and, far of it, with other methods already largely used in management and organizational studies.

Next, I present how OCN can be used to better understand the microfoundations of the institutional logics perspective through a methodological approach.

## 4.5 OCN AND THE FOCUS OF ATTENTION

Attention is one of the most studied constructs in cognitive neuroscience and it is a central topic discussed in organizational studies of decision-making being relevant to the institutional logics perspective, once the focus of attention is constantly affected by the constellations of logics and directly impacts the other microfoundations (Thorton et al, 2013; Laureiro-Martinez et al., 2015; Cohen et al., 2004; Ocasio, 2011). Willed, controlled or sustained attention is activated in tasks that involve planning, decision-making, problem solving, and unusual or difficult situations (Norman & Shallice, 1986; Petersen & Posner, 2012).

Although being an object of interest of cognitive neuroscience and organizational studies, the focus of attention is an under researched theme in OCN. Understanding attention is an important goal of cognitive neuroscience and, at the same time, an elusive concept. As a construct, attention carries a variety of processes and mechanisms that are interrelated operating in diverse ways in the human brain, which makes it difficult to elaborate a unitary concept. It is part of the cognitive system, and it is related to processing sources of information, including and excluding information to achieve goals and complete tasks. (Cohen et al., 2004; Ocasio, 2011).

Because of this variety of concepts and processes of attention, it is important to define what specific phenomenon will be studied, and what mechanisms will be used to explain the phenomenon and its aspects (Cohen et al. 2004). Ocasio (2007, 2011, p. 1287) argues that amid concepts and understandings of attention, at least three types of attention are recurrently identified through neuroimage techniques: selective attention, attentional vigilance, and executive attention. Table 2 describes these three forms of attention and classify, according to Ocasio (2011), organizational uses of attention studies for helping researchers to identify which phenomena and mechanisms are employed to study the focus of attention combining an OCN perspective.

Table 2: *Types of attention and suggestions for use in an OCN perspective*

| Types of attention | Definition | Organizational uses | Example of organizational studies that addressed attention |
|---|---|---|---|
| Selective Attention | "(…) individuals focus information processing in a specific set of stimuli at a moment in time." Because of limitations in cognition the brain cannot process all information and individuals must select which stimuli to attend and which to screen out. | Studies involving conflict resolution, multiple competing goals, interpretation, sensemaking, decision-making | Thorton and Ocasio (1999); Hoffman and Ocasio (2001); Bouquet and Birkinshaw (2008); Hansen and Haas (2001) |
| Attentional Vigilance | "(…) processes by which individuals sustain concentration on a particular stimulus (e.g. waiting for a particular sign to occur or change." This type of attention is limited in duration | Specific tasks limited in duration. | Nadkarni and Barr (2008) |
| Executive Attention | "(…) is central to planning, problem solving, conflict resolution and decision-making". This form of attention is responsible for guiding cognition and action when there is a conflict among goals and enable individuals to process multiple goals. | Problem solving, decision-making, conflict resolution, organizational behavior | Eggers and Kaplan (2009); Kaplan (2008) |

Based on Ocasio (2011)

For instance, Thorton and Ocasio (1999) studied how editorial and market logics in higher-education publishing affect attention through in depth-interview and historical analysis. Hoffman and Ocasio (1999) also studied attention on a paired case comparison of media coverage of nonroutine events that affect the U.S. chemical industry and natural environment. In a quantitative study, Lounsbury (2007) studies attention as a mechanism guided by competing logics to understand how trustee and performance logics influence how mutual

funds from Boston and New York established contracts with independent professional money management firms. Other studies explored the role of the constellation of logics in driving organizational focus of attention (e.g., Nigam & Ocasio, 2010; Dunn & Jones, 2010; Zhang & Luo, 2013; Deroy & Glegg, 2015).

Those studies revealed the influences of institutional logics shaping individual attention through action schemas highlighting the view of embedded agency – the core of institutional logics perspective. Focus of attention, thus, is one of the most important constructs of the institutional logics microfoundations once it is directly related to the others: action schemas, negotiation, communication, social interaction, sensemaking, decision making, and organizational practices. Bringing neuroscience to understand the focus of attention under an OCN perspective can enhance the field and the comprehension of the role of logics in driving individual attention and the individual attention role in changes of institutional logics.

Research in cognitive neuroscience addressing the many types of attention has important implications for the definitions of attention in organization science. Researchers must be aware that the differences among definitions of attention will influence, at least in part, different focus of scholars on selective attention, executive attention, or attentional vigilance. Ocasio highlights that studies of attention in managerial cognition link attention to selective attention, to environmental stimuli (e.g., Daft & Weick 1984, Barr et al. 1992, Corner et al. 1994), and do not consider, at least in an explicit way, other components that involve attention processes as conflict resolution, problem solving, or decision-making.

Despite the lack of a unitary concept, studying the focus of attention through cognitive neuroscience contributes to the development of organizational studies and cognitive neuroscience itself. Neuroscientists are interested in macro-level and context, and their impact on brain processes related to attention (Laureano-Martinez et al., 2015). Studies in OCN must consider the individual and the macro-level, which aggregates to cognitive neuroscience studies.

Functional neuroimaging and electrophysiology are becoming popular in the sciences like psychology, psychiatry and other neurology departments. Other fields that include disciplines like mathematics, sociology, and management also are using these techniques for understanding brain functioning.

There are a variety of methods and techniques that, combined, can be used to study the focus of attention under an institutional logics perspective. I suggest, next, some research problems that can be addressed and the methods available.

### 4.5.1 The influence of institutional logics on top team leaders' focus of attention

Within the organizational studies, the institutional logics perspective considers attention as one of the micro-foundations of institutional logics. Research of attention under this perspective is directly related to interpretation and responses to the pressures arising from multiple logics present in the institutional environment. The focus of attention is guided by institutional logics directly impacting, for example, the decision-making process (Thorton, Ocasio & Lounsbury, 2013). The authors point out that further studies are necessary about the focus of attention since the institutional logics have the function of restricting it and expanding it.

Few researches have been carried out to study the role of institutional logics directing the focus of attention (Ocasio, 1997; Thorton & Ocasio 1999; Thorton 2001; Thorton 2004; Greenwood & Suddaby 2006; Dunn & Jones, 2010; Nigam & Ocasio, 2010; Hulting & Mahring, 2014). However, new studies on attention could deal with recent criticism of this perspective, addressing more directly the microfoundations of Institutional Logics. In addition, the facilitating function of multiple competing logics on the focus of individual or organizational attention has not yet been developed in the literature.

It is known that Institutional Logics lead organizations to develop structures and processes to shape individual or group focus of attention affecting action and cognition. In addition, the existence of environmental stimuli as non-routine organizational events, depending on their importance, can also attract the attention of the individual affecting, for example, actions, problem solving and decision-making. However, I must consider that there are biological functions behind these processes that are responsible for coordinating the focus of attention. Although subject to sociocultural and environmental influences, the individual's behavior depends on the function of the brain since it is that who will coordinate the actors' actions. With that said, the study of the influences of institutional logics on top team leaders is a promising field for OCN.

There a variety of combination of methods that can be used to understand how symbolic and material practices influence top team leaders' focus of attention and it will depend not only on the research question but, also, the availability of the organization and the participants that will be part of the study. I acknowledge the difficult in obtaining access to apply OCN methods on top team leaders' real life within organizations. This is one of the reasons that most work in organizational studies done so far are experiments with MBA students, militaries, university studies and so on.

Of course, when there is the possibility of conducting the research within the organization, the results can be even more revealing. However, it is possible to obtain relevant finds through experiments. No matter if it will be an experiment or a research within an organization, the researcher must, firstly, define what type of attention she/he must study to respond the research question. As seen above, according to Ocasio (2011), there are three types of attention: selective attention, attentional vigilance and executive attention. Selective attention and event attention are the most used types in research involving the institutional logics perspective (e.g., Thorton & Ocasio, 1999; Hoffman & Ocasio, 1999; Lounsbury, 2007; Nigam & Ocasio, 2010; Dunn & Jones, 2010; Zhang & Luo, 2013; Deroy & Glegg, 2015; Hulting & Mahring, 2014).

No matter the type of attention under study, there is a range of method combinations that can be used to achieve a multilevel analysis of the relationship between the institutional logics and the focus of attention. Figure 8 illustrates some of those possibilities.

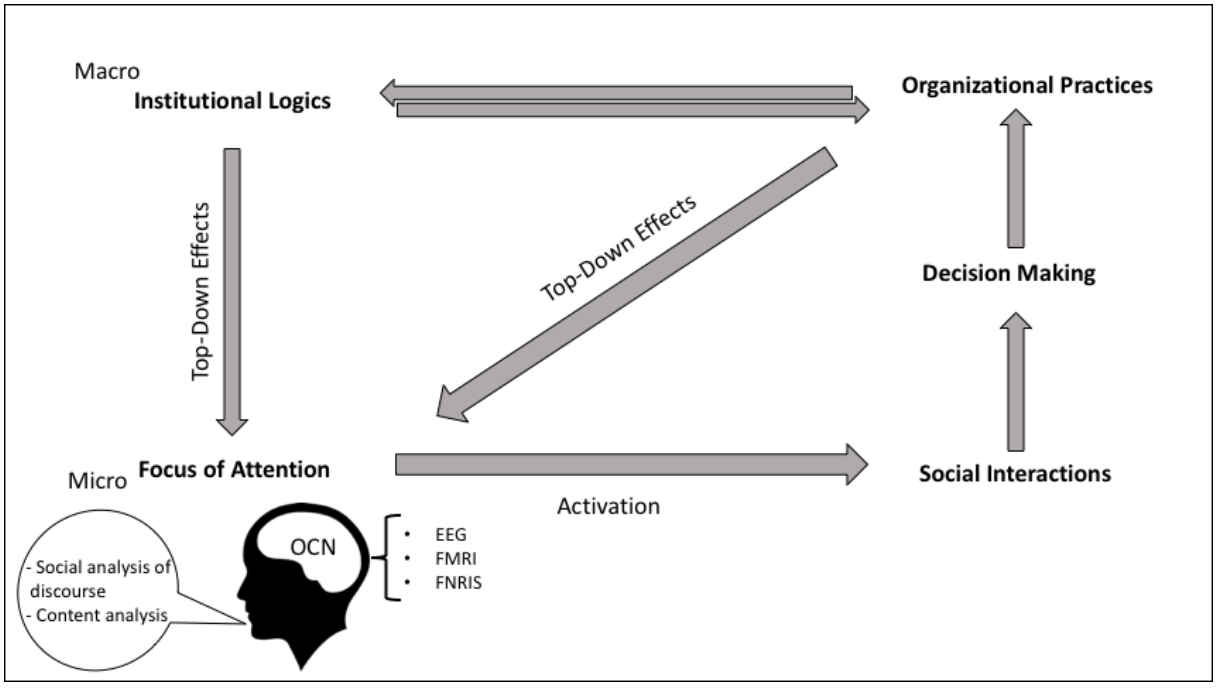


*Figure 7*: Methods suggest for studying the focus of attention

Before starting to detail the use of each method to study the focus of attention, I would like to highlight that, once ethical issues are one of the most prominent obstacles when a researcher decides to adopt an OCN perspective to understand organizational behavior, I decided to explore only the low or non-invasive methods.

One of the most dominating neuroscience techniques due to its low invasiveness, fMRI has been used as an option to apply neuroscience to organizational studies. Despite being considered overtime as a gold standard technique applied by cognitive neuroscience for mapping the human brain due to its good spatial resolution, its low temporal resolution makes its use decreased giving space to other modalities. The time demanded by fMRI to present physiologic response is about 2 seconds – for details about the function of this technique see Fischl & Dale (2000) and Muller et al (2001). It is possible to use fMRI to analyze organizational phenomena such as attention, leadership, emotion and decision making. However, its limitations – impossibility to collect data from a group of individuals, the necessity of a laboratory, low temporal resolution, and high cost – other modalities have its use increased significantly in cognitive neuroscience and it cannot be different in OCN (Balthazard & Tatcher, 2016).

Functional Near Infrared Image (fNIR) is a technique that is growing in cognitive neuroscience and allows the study of attention (e.g., Toichi et al, 2004; Jourdan et al, 2009; Kojima & Suzuki, 2010; Harasawa & Shioiri, 2011; This modality presents a high temporal resolution and can be used through portable devices, which position this technique as a good option for the study of attention through experiments in laboratories and real organization settings. Cutini et al (2012) present a digestible introductory review for those who opt for fNIR to study the focus of attention.

Compared with other low/non-invasive modalities of brain study (e.g. Functioning Magnetic Resonance Imaging (fMRI, fNIRS and Eye tracker) which are based on vascular and neural activities), Electroencephalograph (EEG) shows the electrical activity of the brain cells. Its use involves no health risks and is much less expensive than other modalities. One of the advantages of the EEG is because the individual can do various tasks, facilitating the study of behavior within organizations (Balthazard & Tatcher 2015). Butler et al (2016) points out that this advantage is not present in studies that adopt fMRI methods. “The invasiveness of the fMRI procedure means that the setting and the task are (like most laboratory experiments) removed from actual real choice situations – because participants are in an unnatural situation, discomfort and some level of stress” (Butler et al, 2016, p. 545).

Researchers have employed qEEG technology in studies that addressed decision-making in organizational contexts (Balthazard et al., 2011; Balthazard et al., 2012; Waldman, et al., 2012; Waldman et al. 2011; Hanna et al., 2013; Ravaja et al, 2013; Minas et al., 2014; Tharawadeepimuk & Wongsawat, 2017).

By using those techniques, it is possible to measure and comprehend the brain morphology and the functions associated with behavior contributing for a better understanding of organizational phenomena such as decision-make, leadership and general human behavior of the individual or of groups or teams within organizations (Bathazard & Tatcher, 2015). Although there are studies that applied alternative techniques for measuring brain functioning (e.g. using salivary assays for measuring hormone levels), there is a tendency to adopt neuroimaging and electrophysiology methods in organizational studies and all methods used have their own caveat (Butler et al., 2016).

All those modalities explained above can and must be combined with other methods in order to enrich the analysis and avoid reductionism. One of the assumptions of OCN is the multidisciplinary and the multilevel character (Butler, 2016). Combining methods is a way to guarantee that the context in which the organization is submerged will be considered in the analysis. Besides that, through the use of other methods it is possible to produce multilevel analysis amplifying the view about some phenomena.

Comprehending how institutional logics guide the focus of attention of the individual and the group providing an understanding of the influence of material and symbolic issues on organizational adaptation, which will impact, directly, the organizational practices demands an understanding of the individual and group interpretation and point of view about how logics drives their attention.

The information from the individual and group point of view can be collected through in-depth interviews and non-participant observation considering the main institutional logics proposed by Friedland and Alford (1991), the additional logics proposed latter by Thorton et al (2013) or specific logics of the field under study.

I advocate the use of interviews for gathering data to be used combined with brain information because this is the type of data collection most used in social science research and allows the researcher to capture the desired information in a current and immediate manner, covering a variety of topics and informants according to the objectives of the research (Lüdke & André, 1986). Besides that, in-depth interviews reflect the organizational complexity and the relationships that circumscribe it, being ideal for research that requires detailed insights from individual points of view. It leads the individual to say what he thinks, to describe what he has lived, seen and witnessed (Poupart, 2008; Godoi & Balsini, 2010).

Since I proposed a neuroinstitutional perspective to understand how material and symbolic issues influence top team leaders' focus of attention, the context in which they are inserted and how it can influence other microfoundations such as decision making,

organizational practices, identities, and sensemaking, in-depth interviews proves itself suitable to be used combined with neuroscience modalities.

According to Bennet (2015), there is a growing interest in studies that adopted a multi-method approach to better understand complex phenomena, such as organizations. And wIacknowledge that, despite this growing interest, conducting multi-method research is challenging and requires time and effort to build inter-disciplinary expertise. However, choosing the most appropriate methods to answer the research question allows the strengths of one method cover the weakness of the other and vice-versa. One of the most concerns and critics of bringing neuroscience to organizational studies (see Lindebaum & Zundel, 2013; Healey & Hodgkinson, 2014; Butler et al, 2017) is the risk of reductionism and the tricky question: "and now, so what?". One of the ways to pass through this question is to adopt a multi-method approach that allows a multidisciplinary, multilevel and context concerned approach.

The data analysis must be in consonance with the phenomena under study. I am going beyond the macro, meso and micro analysis to the individual level, including the brain. In order to put side by side what the manager's' brain shows and their interpretation about the influence of the constellation of logics they and the organizational are submitted, we recommend methods that can show it in the analysis such as content analysis and discourse analysis. I do not suggest observational statistical studies because it is used to convey information from large populations, not being ideal for measuring concepts under specific contexts and making interpretative, qualitative and explanatory analysis about individual cases. Once I am using OCN to enter inside the managers' black box, it would be inconsistent with the use of statistical methods to deeply understand manager and group focus of attention under a given context.

I would like to highlight that it is not the goal of this article to describe in detail both methods and, even I suggest the use of content analysis or discourse analysis, both methods have significant differences that must be considered. The researcher must be aware of which is more suitable to answer the research question. While content analysis is a set of techniques to analyze communication in order to – through systematic and objectives procedures – describe the content of the message (Bardin, 2009), discourse analysis analyze not the content, but the meaning of the material collected, that is, seeking the effects of meaning that are related to the discourse manifested by the subject, in which silence or what was not explicitly said, present as much sense as narrative (Orlandi, 2001).

Next, I discuss the possibilities of using the focus of attention to understand decision-making using Task positive network (TPN) e default mode network (DMN).

### 4.5.2 Attention, decision-making and Task positive network (TPN) e default mode network (DMN)

A variety of neural networks are used to study the focus of attention. Recent developments in cognitive neuroscience research point that attention is not a unitary concept, but a variety of inter-related mechanisms and process that act in different ways on the brain level (Ocasio, 2011).

Recent studies in organizational neuroscience points out the existence of two large scale neural networks that can be used to understand the organizational functioning: a) TPN (Task Positive Network), responsible for analytical cognition. TPN is no social and is based on rationality and focused attention; and b) DMN (Default Mode Network), responsible for social cognition. DMN is introspective and based on creative thinking. TPN and DMN are antagonistic networks, which means that, when one is activated the other is suppressed. This characteristic represents a critical restriction in the individual ability of being, simultaneous, analytical and empathic, focused and creative (Friedman et al, 2015).

When coding a continuous stimulus of the real life, the same neural circuits hold the processing and integration of the received information, old and new. This continuous interaction is modulated by attention and is evident in brain areas such as section of the prefrontal cortex of the TPN network and the posterior cingulate cortex (PCC), a hub of the DMN network (Oren et al, 2016).

Organizations that seek effective management should be concerned in balancing those neural networks according to the role or demanding task, which means, a balancing between relational/creative thinking with analytics and focused attention. According to Friedman et al (2015), understanding the functioning of these neural networks brings advantages not only to management and organization studies but also for practice. Cognitive neuroscience suggests that some professionals and organizations benefit from a larger activation of TPN for analytic focus if compared with the activation of DMN for global and creative process and vice versa, depending on the context and situation. According to the authors, organizations where the employees are encouraged to oscillate between neural networks can benefit from the separation of tasks requiring greater dependence on one network than the other. Besides that, the authors claim for more studies that can define to what extension the individual differences promote or depress the capacity of efficiently alternate both TPN and DMN in order to improve creative thinking of sustained focus and how and at what point this ability can be modified by education, training and intervention.

It is known that organizations and individuals are subject to institutional logics that shape the problems and situations that must be attended, driving the focus of attention. Institutional logics perspective highlights the role of attention both in top-down and bottom-up processes, more analytical and cognitive, and bottom-up processes, which has an automatic character and is influenced by other stimulus such as environment and behavioral responses. Both processes influence and determine the use of TPN and DMN networks that are activated during organizational practice and strategy creation and decision-making. Those processes require not only the rational analysis of material and symbolic issues but also creative to stand out in a field permeated by a constellation of logics.

Thus, institutional logics shape the individual's focus of attention by restricting or enabling action and cognition through a top-down effect while the individual is also subject to environmental and behavioral stimuli that lead to an automatic action. Both processes can influence the activation of brain networks responsible for rational analysis (TPN) and for creativity and socioemotional relationships (DMN) that are antagonistic and generate different responses to stimuli. The way these networks are stimulated resulting in the activation of one at the suppression of the other will have a direct impact on how the organizations respond to the logics. It is not our intention here to provide a complete explanation about TPN and DMN processes. If the reader wants more deep information, we recommend Friedland et al (2015) and Hanna and Waldman (2016).

The study of TPN and DMN allows the understanding of how top-down and bottom-up processes are integrated and how it, under symbolic and material practices, integrate individual and organizational attention to respond the pressures through the decision making and the creation of goals, strategies, and organizational practices.

Knowing the role of attention, guided by logics, integrating organization and individual and its influence on decision-making and creation of organizational practices requires a multilevel and multimethod research where individuals' attention would be analyzed under the OCN and organizational attention under qualitative and/or interpretive methods. As mentioned above, I advocate the combination of methods when a researcher decides to use OCN, especially integrating with the institutional logics perspective, which holds a multilevel character.

Research that investigate TPN and DMN processes (Dehaene & Cohen, 2007; Knops, Thirion, Hubbard, Michel, & Dehaene, 2009; Piazza, Mechelli, Butterworth, & Price, 2002; Morelli & Lieberman, 2013; Rameson, Morelli, & Lieberman, 2012; Van Overwalle, 2009) used fMRI or PET/SPECT modalities. Even being a promising study to contribute to the

understanding of the role of attention under an institutional logics perspective, both techniques require the availability of a laboratory, which increases costs and restrain the possibility of collecting data during the real life of the individuals. Experiments can be conducted using the information collected through content analysis, discourse analysis, non-participant observation and documental analysis to create settings that can be used in the laboratory recreating the organizational reality. Figure 9 illustrate the possibilities of methods to study the antagonistic neural networks underlying the institutional logics perspective.

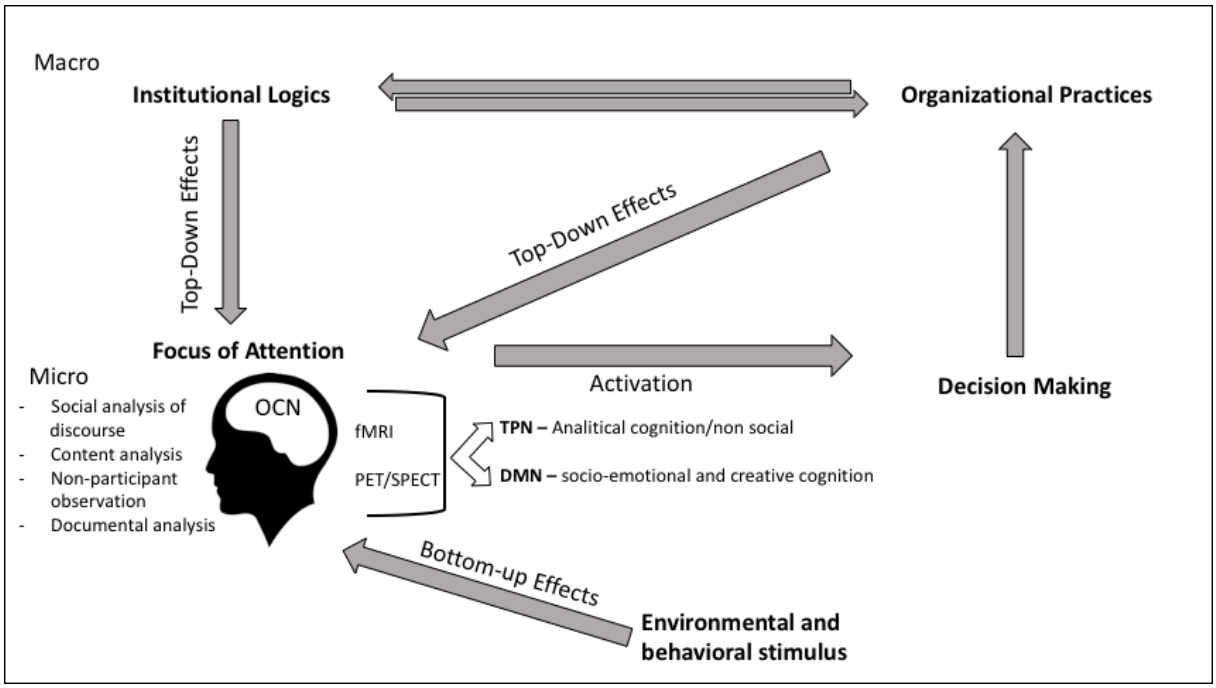


*Figure 8*: Methods suggested to study attention and decision making under an antagonistic neural network

Next, I explore some possibilities of OCN for better understanding social interaction under the institutional logics perspective.

## 4.6 OCN AND SOCIAL INTERACTION

Individuals are not solitary. Social actors are constantly creating, changing and reproducing organizational and institutional structures through interaction, bringing to life shared knowledge and belief systems (Berger & Luckmann, 1967).

Within the Institutional theory, the institutional logics perspective considers social interaction, according to Thorton et al (2013), as one of its microfoundations.

The availability of multiple logics allows individuals to access the knowledge of each logic in actions related to social sensemaking, problem solving, decision making and coordination. The availability of a constellation of logics for cognition and action does not imply that all institutional logics have the same probability of being invoked. That happens because, according to Friedland and Alford (1991), individuals are endowed with agency to determine which logics they rely on for social action and interaction.

Once the theory of dynamic constructivism explains intraindividual cognitive processes (Brett, 2010), one can say that individuals act as social actors interacting with each other in order to reproduce and transform organizational and institutional structures. Those interactions are both material and symbolic and are essentially permeated by negotiations, exchanges and communications.

Negotiation as well as communicative interactions can be examined by symbolic interactionist perspective once, the mind is a "social phenomenon – arising and developing within the social process, within the empirical matrix of social interactions (Mead, 1934; p.133). Thus, it is possible to affirm that expectations of social interaction shape the situational context of cognition that will drive the focus and content of group and individual attention. Those interactions occur through language which is the key to thought and action.

Institutional logics blend practice and symbols through language. Social actors use a common language to achieve cooperation and shared attention and, according to Thorton et al (2013), each logic carries a common and distinct language that they decided to term as "a vocabulary of practice". For the authors, vocabularies of practice are "systems of labeled categories used by members of a social collective to make sense of and construct organizing practices" (Thorton et al, 2013, p. 159). However, Collins (1993) points out that interaction, no matter in which context, is responsible for driving not only the individuals' focus of attention, but it triggers and demands emotional energy as well.

Following that assumption, we can say that, not only vocabulary, but also individual emotion is important to regulate actions making some enactments more successful than others. Emotions affect language and vice-versa (Weis and Herbert, 2017). Although is known that emotions effectively focus individuals'' attention, the Cross-Level Model of Institutional Logics do not theorize it as part of the microfoundations of institutional logics. Following this thought, we can go beyond the term vocabulary of practice used during social interaction to **language of practice**, verbal and nonverbal. Especially in contexts that involve multiple cultures, languages and identities, nonverbal language plays an important role during social interactions.

Knowing the organizational language present in the social interaction is relevant once, according to Thorton et al (2013), is during interactions that actors rely on institutional logics and their constituent identities, goals and schemas in order to create and reproduce organizational practices through decision making, sensemaking and mobilization. Institutional logics afford cognitive and symbolic elements used by actors during social interactions in order to create, reproduce and change practices and organizational identities.

Also, it is known that Institutional Logics lead organizations to develop structures and processes to shape individual or group focus of attention affecting action, emotion, behavior and cognition. In addition, the existence of environmental stimuli as non-routine organizational events, depending on their importance, can also drive behavior of the individual affecting, for example, actions, problem solving and decision-making during interactions. With that said, we must consider that there are biological functions behind those processes that are responsible for coordinating human interaction through language and behavior. The individual's behavior, although subject to sociocultural and environmental influences, depends on the function of brain since it is that who will coordinate the actors' actions.

As mentioned above, language comprises not only vocabulary but, facial expressions, body language, gestures, signals, etc. According to Weis and Hebert (2017), verbal and nonverbal language activation are strongly interconnected and affect each other.

Expression of emotion is one type of language that is manifested through some mechanisms as facial expressions, heart rate or skin conductance and influence other individuals behavior (manifested through gestures, for example) and is a key of spoken and written language. Our brain holds structures responsible for processing facial information in a holistically way and can be categorized fasted than an ongoing verbal communication (Trichas et al, 2016; Fisk & Taylor, 2013). Thus, emotion cannot stay aside of the microfoundations "for a man cannot easily behave in an impersonal, sternly rule-prescribed fashion towards his kinsmen, of for that matter toward his old friends" (Hallet and Ventresca, 2006, p 223), for example. Emotion not only mediates the formation and reproduction of institutions but, sometimes, it is itself institutional.

I believe that OCN can contribute to a broad and multilevel understanding of the social interactions that occur within an organization in an innovative way: studying not only what is being said by top team leaders, but what is not being said combining interpretative methods with the OCN perspective. As mentioned before, putting the premises of the institutional logics perspective with OCN together is an advance in organization studies, especially due the fact that, on one hand, OCN claims for multilevel studies that combine the individual with the

context they are embedded in multilevel approaches and, on the other hand, the institutional logics perspectives claim for new methods capable to capture the multiple nuances present in an organization (macro, meso and micro levels).

Going beyond vocabulary can bring a broader understanding of how top team leaders or other organizational members access and activate the institutional logics in order to make sense and construct the organizational practices that will drive decision making.

Understanding language in its various facets demands different approach. Social interaction in the institutional logic perspective is a dynamic phenomenon of accessing and activation of logics where verbal and nonverbal language are constantly being used. To understand it deeply, the various types of language should not be separated from each other which demands more than one lenses to capture and analyze it. To achieve the purpose, I highly recommend the adoption of qualitative and/or interpretative methods to understand the verbal language and neuroscientific methods to understand the nonverbal language.

Organizations are constantly adapting to institutional logics. That adaptation requires interaction between the organization members and involves internal and external issues in more than one level: macro, meso and micro.

Therefore, I propose the researcher not be concerned only with the diversity of internal and external issues to the organizations related to the access and activation of institutional logics. More than that, though, researchers should be concerned in considering what happens inside the brains of actors that is revealed not only by what is being said but also, by what is showing through emotion (facial expressions) and behavior (body language).

It is known that the environment and the pressures of the logics influence individuals and organizations behavior and the manifestation of logics can be seeing during social interaction. To broader understand the individual or the group behavior is necessary to consider the processes that occur within the brain and is expressed to emotions and body language when they are interacting.

Before talking about how to understand individual and group behavior and, consequently, organizational behavior, it is important to remind that organizations are highly complex social environments. Therefore, many of our most important decisions are made in contexts of social interactions. Thus, a brain will only engage in certain action if it has a subconscious evaluation that there will be a positive return to its action within a given context. In general, organizational neuroscience is the study of several underlying neural systems that are relevant to social interactions in organizational contexts (Waldman & Balthazard, 2016). Hanna *et al* (2013, p.406) suggest that the growing interest in management and organizational

studies using biological methods can be named as a cognitive revolution that culminates in a methodological revolution.

However, the use of neuroscience in organizational studies goes beyond applying brain technology to understand organizational phenomena. According to Butler et al (2016) OCN is a multidisciplinary approach that aims to contribute with methodology and theory. OCN concerns not only with the study of the brain but also with the incorporation of this knowledge to organizational theory. Besides, this perspective is concerned not only with understanding the individual applying neuroscientific methods. More than that, one of its goals is to use that information to understand the connections existent between the human being, the organization and the social context, being suitable to understand social interaction due the multilevel character of the institutional logics perspective.

Figure 10 provide a better understanding of the concepts used, their relationship and how to adopt neuroscience techniques to study social interaction considering the subjects, methods and concepts.

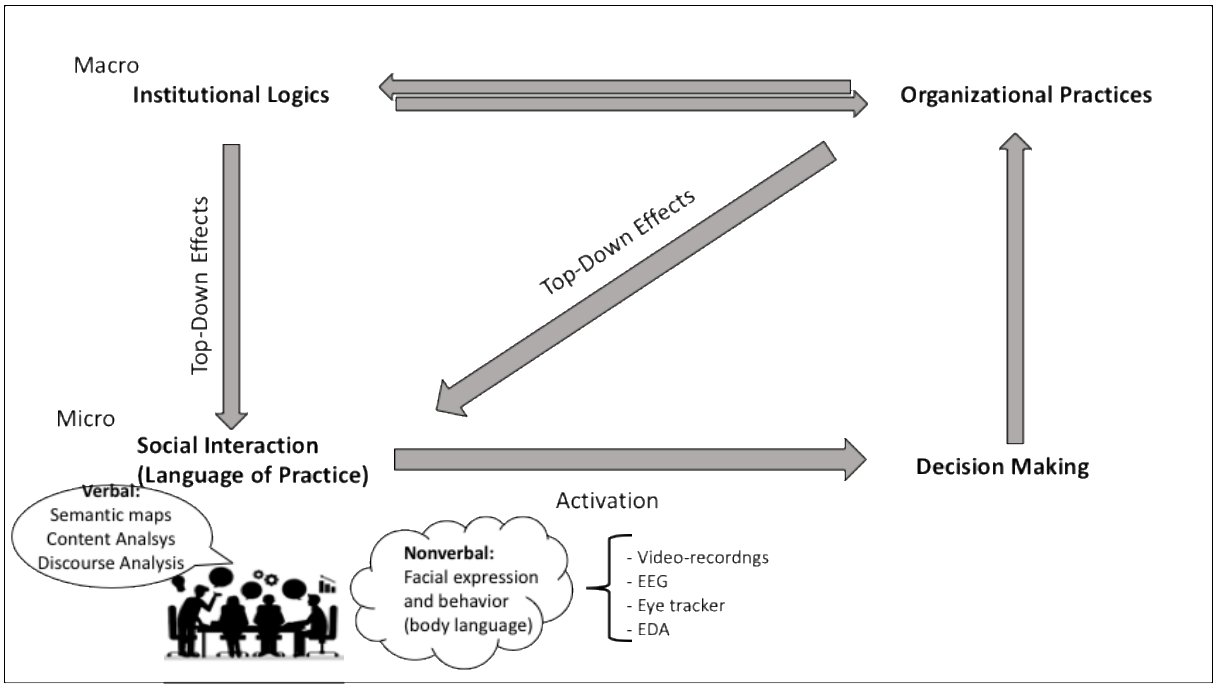


*Figure 9*: Methods suggest to study behavior in social interaction through a neuroinstitutional perspective

The study of human behavior and emotion using neuroscientific technics is becoming popular in the sciences like psychology, psychiatry and other neurology departments. Other

fields that include disciplines like mathematics, sociology, and management also are using these techniques for understanding brain functioning and human behavior.

There is a growing interest in the involvement of the body in research on social interaction and language. Nevile 2015 brings the term “the embodied turn” referring to the change of research considering only verbal language in social interaction to a crescent interest in the body reactions during social interaction (hand and other gestures, gaze direction, posture and orientation, facial expression, etc.).

According Nevile 2015, to analyze the natural course of a social interaction considering its context and real time, researchers have relied on transcriptions from audio and, increasingly, on video-recordings. Hopper (1990) points out that when the researcher uses video recording combined with transcriptions, the analyze becomes alive and enriched once it captures more nuances of the context where the social interaction happened.

I recommend the use of video recording in order to analyze facial expression and body language. Using video-based data allows to capture of the context in which some thing was said and the linkage between of is being said and the emotions and behavior behind of what is being said. According to Kofler et al (2017), videos are useful when analyzing group interaction because there are multiple individuals and tracking their behavior, expressions and who is speaking is essential for coding and analyzing the interaction. Although putting a camera in the room could influence and change individual behavior, previous research has been showing that, once participants are advised to ignore the camera they enter in their routine. That can be attested through some behaviors as telling jokes, gossiping or criticizing absent members of the interaction (Lehmann-Willenbrook & Kauffed, 2010; Penner et al, 2007; Coleman, 2000).

There is a variety of specialized software to code and analyze the material collected, participants’ emotions and behavior captured with the video-recording such as, iMotions, Fraunhofer Shore, Noldus FaceReader, and The Observer XT Noldus. The software can be programmed to be automatically synchronized to describe nonverbal language (emotion and behavior) and are used to understand the brain mechanisms related to cognitive and social behavior. Besides that, if it is not possible to video-recording meetings, for example, the software also analyzes facial expressions from photos – but it will also depend on the possibility of photos analysis effectively answer the research question.

Facial expressions can be divided into the following categories: happy, sad, angry, surprised, scared, disgusted and neutral. In addition, some of other facial expressions related

to attention will be considered: gaze direction, and whether eyes or mouth are closed or not. It is also possible to use an Eye tracker to study attention combined with language and behavior.

For the reader who desires to be more familiarized with video-recordings modalities I suggest the following studies: Michel and Kaliouby (2003), Cohen et al (2003), Skiendziel et al (2019), Stöckli et al (2018), Lewinski et al (2014), Leitch et al (2015).

EEG is another technique that can be used for emotion detection. There are affordable and portable devices that guarantee great levels of accuracy such as Emotiv Epoc and Neuro Sky Mind Wave and can be used in real settings. As in video-recordings, it is possible to detect the six major emotions (joy, surprise, sadness, fear, disgust, and anger). Matlovic et al (2016) present a detailed demonstration of how to use EEG to analyze emotion through a case of study using images to stimulate emotion. There are other studies that applied EEG to capture and analyze emotion (see: Bos, 2006; Lin et al, 2010; Liu et al, 2011; Zheng & Lu, 2015).

EDA is a pertinent alternative for measuring emotion and can contribute to studies addressing social interaction and decision making. EDA variations are related with sweat secreted by eccrine sweat glands. By being a good indicator of reticular activation EDA can measure the energetic dimension of emotion which can be observed when an individual is exposed to emotional pictures or emotional words (Sequeira et al, 2009; Bradley and Lang, 2000).

The categories related to emotion can be combined with coded behaviors. I suggest to the researcher that desires to understand how socio-cultural conditions influence actors nonverbal language in access and activation of the field-level institutional logics driving to decision making, to code behavior according behavior indicators of group consensus: specific verbal and nonverbal behaviors – related to supportive statements; agreement statements; procedural statements; and facial expressions of those individual who makes the statement and those who react to the statements (Lehmann-Willenbrock & Allen, 2018).

Suppose the organizational institutional context and the constellation of logics will be drawn when the data collection starts. In that case, the unitizing and coding can be made through an inductive approach once the organizational institutional context and the constellation of logics will be drawn when the data collection starts.

Here, I recommend, once again, a multi-method approach. Qualitative and interpretative methods allow the research a comparison of what is being said and perceived by the actors with what their faces, body and brains show. According to Matlovic et al (2016) there is a tradition in psychology in using questionnaires and interviews to capture the participants' emotions related to a given event. However, this method can be considered very

efficient once it does not capture the emotion and behavior in real settings and at the exact time it occurs. Then, comparing interviews, semantic maps (Ritter, 1989) and other types of data allows the researcher to capture, for example, different nuances between what the actors say about the influence of logics and what their body shows.

## 4.7 CONCLUSIONS

Our purpose with this study is to guide scholars who want to use Organizational Cognitive Neuroscience to expand the institutional logics perspective suggesting appropriate methods to understand the microfoundations proposed by Thorton et al (2013). Despite the number of good studies advocating the advantages of bringing cognitive neuroscience to management and organization studies, there is still a lack of specific guides to conduct scholars not familiarized with neuroscience.

I believe in a fruitful field rose by blending the institutional logics perspective with OCN towards a neuroinstitutional perspective. This endeavor demands collaborative research between neuroscientists and organizational researchers. But it is crucial that institutional theory scholar knows some of the possibilities for bringing neuroscience to our field in order to both disciplines benefit from this combination. The correct choice of the method to answer a given research question decreases the risk of engagement in laborious research, often involving high costs and at the end face the tricky question: “so what?”. It is important to make sure that the use of neuroscientific techniques will answer questions still not responded, bring a new understanding of a phenomenon or, according to Butler and Senior (2011), provide a fresh perspective for competing theories and explanations of the same phenomenon.

But why institutional theory scholars should learn about cognitive neuroscience and embrace OCN? The institutional logics perspective sheds light on the individual actor and its agency capacity. Bringing OCN to understand the influence of a constellation of logics and symbolic and material practices on organizational and individual actions provides an extra layer for human and organizational behavior: the individual actors’ brain.

I acknowledge the obstacles and pitfalls that go along with the choice for a neuroinstitutional perspective. The first is related to ontological and epistemological issues. To avoid the danger of combining interpretative methods with biological sciences, I recommend the adoption of a philosophical positioning that supports the combination of, at the first sight, divergent perspectives. Critical realism is a suitable base to sustain the multi-method research that I propose here. Healey and Hodgkinson (2014) provided a good explanation about how a

critical realist approach can be a good alternative to use neuroscience methods and concepts in management and organization studies avoiding the risk of reductionism.

Second, also acknowledge the difficulty in applying neuroscience methods to organizational research due to ethical issues, costs and, in some cases, the necessity of a laboratory. Regarding ethical issues, this is not the aim of this article, however, I recommend the reader the work of Waldman et al (2015) and Senior (2008).

I cannot deny the challenges related to costs and the applicability of neuroscience modalities in organizational studies. However, with the technology evolution, it is possible to find, as I showed above, techniques that can present low costs and that can be transported to the organizations to capture its real life. For instance, researchers that opt for using EEG in their studies can count on portable devices that do not take managers away from their daily tasks and reality and that is more affordable than the use of a laboratory. Other techniques such as eye tracker, video recordings and EDA also provide useful insights and is a good option in terms of cost and the capture of the organizational reality.

There is still an unexplored world in the institutional theory: the individual's brain. And I encourage scholars to unveil this fascinating and promising world through the use of OCN. A neuroinstitutional perspective can lead to significant advances in the way we understand the influences of symbolic and material practices in the organizational life, once it can show not only the researcher perception and the participants discourse but also, the individual actors Blackbox.

REFERENCES

Ashkanasy, N. M., Becker, W. J., & Waldman, D. A. (2014). Neuroscience and organizational behavior: Avoiding both neuro-euphoria and neuro-phobia. Journal of Organizational Behavior, 35(7), 909-919.

Audrin, C., Brosch, T., Sander, D., & Chanal, J. (2018). More than meets the eye: The impact of materialism on information selection during luxury choices. *Frontiers in behavioral neuroscience*, *12*, 172.

Balconi, M., Fronda, G., Venturella, I., & Crivelli, D. (2017). Conscious, pre-conscious and unconscious mechanisms in emotional behaviour. Some applications to the mindfulness approach with wearable devices. *Applied Sciences*, *7*(12), 1280.

Balthazard, P. A., & Thatcher, R. W. (2015). Neuroimaging modalities and brain technologies in the context of organizational neuroscience. In Organizational neuroscience (pp. 83-113). Emerald Group Publishing Limited

Barakova, E. I., Spink, A. S., de Ruyter, B., & Noldus, L. P. (2013). Trends in measuring human behavior and interaction.

Bardin, Laurence. Análise de conteúdo. Lisboa edições, 2009.

Barr, P. S., Stimpert, J. L., & Huff, A. S. (1992). Cognitive change, strategic action, and organizational renewal. *Strategic management journal*, *13*(S1), 15-36.

Becker, W. J., & Menges, J. I. (2013). Biological implicit measures in HRM and OB: A question of how not if. *Human Resource Management Review*, *23*(3), 219-228.

Becker, William J.; Cropanzano, Russell. Organizational neuroscience: The promise and prospects of an emerging discipline. Journal of Organizational Behavior, v. 31, n. 7, p. 1055-1059, 2010.

Bennett, A. (2015). Found in translation: Combining discourse analysis with computer assisted content analysis. *Millennium*, *43*(3), 984-997.

Bjørhei, A., Pedersen, F. T., Muhammad, S., Tronstad, C., Kalvøy, H., Wojniusz, S., ... & Sütterlin, S. (2019). An investigation on bilateral asymmetry in electrodermal activity. *Frontiers in Behavioral Neuroscience*, *13*, 88.

Bos, D. O. (2006). EEG-based emotion recognition. *The Influence of Visual and Auditory Stimuli*, *56*(3), 1-17.

Boyatzis, R. E., Passarelli, A. M., Koenig, K., Lowe, M., Mathew, B., Stoller, J. K., & Phillips, M. (2012). Examination of the neural substrates activated in memories of experiences with resonant and dissonant leaders. *The Leadership Quarterly*, *23*(2), 259-272.

Bradley, M.M., Lang, P.J., 2000. Measuring emotion: behavior, feeling and physiology. In: Lane, R.D., Nadel, L. (Eds.), Cognitive Neuroscience of Emotion. Oxford University Press, Oxford, pp. 242–276.

Butler, Michael Jr; Senior, Carl. Toward an organizational cognitive neuroscience. Annals of the New York Academy of Sciences, v. 1118, n. 1, p. 1-17, 2007

Butler, M. J. (2017). Organizational cognitive neuroscience–potential (non-) implications for practice. Leadership & Organization Development Journal, 38(4), 564-575.

Butler, Michael JR et al. How Organizational Cognitive Neuroscience Can Deepen Understanding of Managerial Decision-making: A Review of the Recent Literature and Future Directions. International Journal of Management Reviews, v. 18, n. 4, p. 542-559, 2016.

Butler, M. J., Lee, N., & Senior, C. (2017). Critical essay: organizational cognitive neuroscience drives theoretical progress, or: the curious case of the straw man murder. *Human Relations*, *70*(10), 1171-1190.

Cho, T. S., & Hambrick, D. C. (2006). Attention as the mediator between top management team characteristics and strategic change: The case of airline deregulation. *Organization Science*, *17*(4), 453-469.

Christopoulos, G. I., Uy, M. A., & Yap, W. J. (2019). The body and the brain: measuring skin conductance responses to understand the emotional experience. *Organizational Research Methods*, *22*(1), 394-420.

Cohen, I., Sebe, N., Garg, A., Chen, L. S., & Huang, T. S. (2003). Facial expression recognition from video sequences: temporal and static modeling. *Computer Vision and image understanding*, *91*(1-2), 160-187.

Corner, P. D., Kinicki, A. J., & Keats, B. W. (1994). Integrating organizational and individual information processing perspectives on choice. *Organization Science*, *5*(3), 294-308.

Cutini, S., Moro, S. B., & Bisconti, S. (2012). Functional near infrared optical imaging in cognitive neuroscience: an introductory review. *Journal of Near Infrared Spectroscopy*, *20*(1), 75-92.

Daft, R. L., & Weick, K. E. (1984). Toward a model of organizations as interpretation systems. *Academy of management review*, *9*(2), 284-295.

Dehaene, S., & Cohen, L. (2007). Cultural recycling of cortical maps. *Neuron*, *56*(2), 384-398.

Deroy, X., & Clegg, S. (2015). Back in the USSR: Introducing recursive contingency into institutional theory. *Organization Studies*, *36*(1), 73-90.

Dimaggio, P.J; Construction and organizational field as a professional project: US Art Museums, 1920-1940. W.W. The new institucionalism in organizational analysis. London: University of Chicago Press, 1991, pp. 267-292.

Dimaggio, P. J. & Powell, W.W. The iron cage revisited: institutional isomorphism and collective rationality in organizational fields. American Sociological Review, 1983.

_____&_____. Introduction. In: Powell, W.W. & Dimaggio, P.J.. The new institucionalism in organizational analysis. Chicago: University of Chicago Press, 1991. p. 1-38

Dunn, M. B., & Jones, C. (2010). Institutional logics and institutional pluralism: The contestation of care and science logics in medical education, 1967–2005. *Administrative science quarterly*, *55*(1), 114-149.

Friedland, Roger; Alford, Robert R. Bringing society back in: Symbols, practices and institutional contradictions. 1991.

Fischl, B., & Dale, A. M. (2000). Measuring the thickness of the human cerebral cortex from magnetic resonance images. Proceedings of the National Academy of Science, 97, 11050_11055.

Friedman, Jared et al. Antagonistic neural networks underlying organizational behavior. In: Organizational Neuroscience. Emerald Group Publishing Limited, 2015. p. 115-141.

Giddens, Anthony. The constitution of society: Outline of the theory of structuration. Univ of California Press, 1984.

Godoi, C. K., & Balsini, C. PV(2010). A pesquisa qualitativa nos estudos organizacionais brasileiros: uma análise bibliométrica. *SILVA, A. B.; GODOI, CK; BANDEIRA--DEMELO, R.(orgs). Pesquisa qualitativa em estudos organizacionais: paradigmas, estratégias e métodos*, *2*.

Greenwood, R., Díaz, A. M., Li, S. X., & Lorente, J. C. (2010). The multiplicity of institutional logics and the heterogeneity of organizational responses. *Organization Science*, *21*(2), 521-539.

Greenwood, Royston et al. Institutional complexity and organizational responses. Academy of Management annals, v. 5, n. 1, p. 317-371, 2011.

Greenwood, Royston; Suddaby, Roy. Institutional entrepreneurship in mature fields: The big five accounting firms. Academy of Management journal, v. 49, n. 1, p. 27-48, 2006.

Hannah, S. T., Balthazard, P. A., Waldman, D. A., Jennings, P. L., & Thatcher, R. W. (2013). The psychological and neurological bases of leader self-complexity and effects on adaptive decision-making. Journal of Applied Psychology, 98(3), 393.

Handy, T. C. (2005). Event-related potentials: A methods handbook. Cambridge, MA: MIT Press.

Hayashi, K., Aono, S., Fujiwara, M., Shiro, Y., & Ushida, T. (2020). Difference in eye movements during gait analysis between professionals and trainees. *PloS one*, *15*(4), e0232246.

Healey, Mark P.; Hodgkinson, Gerard P. Rethinking the philosophical and theoretical foundations of organizational neuroscience: A critical realist alternative. Human Relations, v. 67, n. 7, p. 765-792, 2014.

Hoffman, A. J. (1999). Institutional evolution and change: Environmentalism and the U. Schemical industry. Academy of Management Journal , 42(4):351-371.

Hoffman, A. J., & Ocasio, W. (2001). Not all events are attended equally: Toward a middle-range theory of industry attention to external events. *Organization science*, *12*(4), 414-434.

Hopper, R. (1990). Ethnography and conversation analysis after Talking Culture. *Research on Language & Social Interaction*, *24*(1-4), 161-171.

Jack, A. I., Rochford, K. C., Friedman, J. P., Passarelli, A. M., & Boyatzis, R. E. (2019). Pitfalls in organizational neuroscience: A critical review and suggestions for future research. *Organizational Research Methods*, *22*(1), 421-458.

Jack, A., Boyatzis, R. E., Khawaja, M., Passarelli, A. M., & Leckie, R. (2013a). Visioning in the brain: An fMRI Study of inspirational coaching and Mentoring. Social Neuroscience, 8(4), 369–384.

Jack, A. I., Dawson, A., Begany, K., Leckie, R. L., Barry, K., Ciccia, A., et al. (2012). fMRI reveals reciprocal inhibition between social and physical cognitive domains. Neuroimage, 66C, 385–401.

Jia, Y., & Tyler, C. W. (2019). Measurement of saccadic eye movements by electrooculography for simultaneous EEG recording. *Behavior Research Methods*, *51*(5), 2139-2151.

Jourdan Moser, S. Cutini, P. Weber and M.L. Schroeter, "Right prefrontal brain activation due to Stroop interference is altered in attention-deficit hyperactivity disorder—A functional near-infrared spectroscopy study", *Psychiatry Res.* 173, 190 (2009). doi: 10.1016/j.pscychresns.2008.10.003

Kable, J. W. (2011). The cognitive neuroscience toolkit for the neuroeconomist: A functional overview. *Journal of Neuroscience, Psychology, and Economics*, *4*(2), 63.

KojimaandT.Suzuki,"Hemodynamicchangein occipital lobe during visual search: Visual attention allocation measured with NIRS", *Neuropsychologia* 48, 349 (2010).

Kraig, A. F., Barraza, J. A., Montgomery, W., & Zak, P. J. (2019). The Neurophysiology of Corporate Apologies: Why Do People Believe Insincere Apologies?. *International Journal of Business Communication*, 2329488419858391.

Krueger, R. F., Hicks, B. M., Patrick, C. J., Carlson, S. R., Iacono, W. G., & McGue, M. (2009). Etiologic connections among substance dependence, antisocial behavior, and personality: modeling the externalizing spectrum.

Khushaba, R. N., Greenacre, L., Kodagoda, S., Louviere, J., Burke, S., & Dissanayake, G. (2012). Choice modeling and the brain: A study on the Electroencephalogram (EEG) of preferences. *Expert Systems with Applications*, *39*(16), 12378-12388.

Laureiro-Martínez, D., Venkatraman, V., Cappa, S., Zollo, M., & Brusoni, S. (2015). Cognitive Neurosciences and Strategic Management: Challenges and Opportunities in Tying the Knot The first and second authors contributed equally. In *Cognition and Strategy* (pp. 351-370). Emerald Group Publishing Limited.

Lewinski, P., den Uyl, T. M., & Butler, C. (2014). Automated facial coding: validation of basic emotions and FACS AUs in FaceReader. *Journal of Neuroscience, Psychology, and Economics*, *7*(4), 227.

Lin, Y. P., Wang, C. H., Jung, T. P., Wu, T. L., Jeng, S. K., Duann, J. R., & Chen, J. H. (2010). EEG-based emotion recognition in music listening. *IEEE Transactions on Biomedical Engineering*, *57*(7), 1798-1806.

Lindebaum, D. (2014). Ideology in organizational cognitive neuroscience studies and other misleading claims. *Frontiers in human neuroscience*, *8*, 2.

Lindebaum, D., & Zundel, M. (2013). Not quite a revolution: Scrutinizing organizational neuroscience in leadership studies. *human relations*, *66*(6), 857-877.

Lindebaum, D. (2016). Critical essay: Building new management theories on sound data? The case of neuroscience. *human relations*, *69*(3), 537-550.

Lindebaum, D. (2014). Ideology in organizational cognitive neuroscience studies and other misleading claims. *Frontiers in human neuroscience*, *8*, 2.

Liu, Y., Sourina, O., & Nguyen, M. K. (2011). Real-time EEG-based emotion recognition and its applications. In *Transactions on computational science XII* (pp. 256-277). Springer, Berlin, Heidelberg.

Lounsbury, M. (2007). A tale of two cities: Competing logics and practice variation in the professionalizing of mutual funds. *Academy of management journal*, *50*(2), 289-307.

Lüdke, Menga; André, Marli Eda. Pesquisa em educação: abordagens qualitativas. 1986.

Matlovic, T., Gaspar, P., Moro, R., Simko, J., & Bielikova, M. (2016, October). Emotions detection using facial expressions recognition and EEG. In *2016 11th international workshop on semantic and social media adaptation and personalization (SMAP)* (pp. 18-23). IEEE.

Meyer, J. W., Rowan, B. Institutionalized organizations: formal structures as myth and ceremony. In: MEYER, J. W., SCOTT, W.R. Organizational environments ritual and rationality. London : Sage, 1992. p. 41-62.

Meyer, John W.; Rowan, Brian. Institutionalized organizations: Formal structure as myth and ceremony. American journal of sociology, v. 83, n. 2, p. 340-363, 1977.

Michel, P., & El Kaliouby, R. (2003, November). Real time facial expression recognition in video using support vector machines. In *Proceedings of the 5th international conference on Multimodal interfaces* (pp. 258-264).

Michel, C. M., Murray, M. M., Lantz, G., Gonzalez, S., Spinelli, L., & de Peralta, R. G. (2004). EEG source imaging. *Clinical neurophysiology*, *115*(10), 2195-2222.

Minas, R. K., Potter, R. F., Dennis, A. R., Bartelt, V., & Bae, S. (2014). Putting on the thinking cap: using NeuroIS to understand information processing biases in virtual teams. *Journal of Management Information Systems*, *30*(4), 49-82.

Molenberghs, P., Prochilo, G., Steffens, N. K., Zacher, H., & Haslam, S. A. (2017). The neuroscience of inspirational leadership: The importance of collective-oriented language and shared group membership. *Journal of management*, *43*(7), 2168-2194.

Muller, K., Lohmann, G., Bosch, V., & von Cramon, D. Y. (2001). On multivariate spectral analysis of fMRI time series. Neuroimage, 14, 347_356.

Nermend, K. (2017). The implementation of cognitive neuroscience techniques for fatigue evaluation in participants of the decision-making process. In *Neuroeconomic and Behavioral Aspects of Decision Making* (pp. 329-339). Springer, Cham.

Nevile, M. (2015). The embodied turn in research on language and social interaction. *Research on Language and Social Interaction*, *48*(2), 121-151.

Nigam, Amit; Ocasio, William. Event attention, environmental sensemaking, and change in institutional logics: An inductive analysis of the effects of public attention to Clinton's health care reform initiative. Organization Science, v. 21, n. 4, p. 823-841, 2010.

Norman, D. A., & Shallice, T. (1986). Attention to action. In *Consciousness and self-regulation* (pp. 1-18). Springer, Boston, MA.

Ocasio,W. 1997. Towards an attention-based view of the firm. Strategic Management J. 18(S1) 187–206.

Ocasio, William. Attention to attention. Organization Science, v. 22, n. 5, p. 1286-1296, 2011.

Orlandi, E. P. Discurso e leitura. 6. ed. São Paulo: Cortez, 2001.

Oren, Noga et al. How attention modulates encoding of dynamic stimuli. Frontiers in human neuroscience, v. 10, 2016.

Petersen, S. E., & Posner, M. I. (2012). The attention system of the human brain: 20 years after. *Annual review of neuroscience*, *35*, 73-89.

Poupart, Jean et al. A pesquisa qualitativa. Enfoques epistemológicos e metodológicos, v. 2, 2008.

Powell, Thomas C. Neurostrategy. Strategic Management Journal, v. 32, n. 13, p. 1484-1499, 2011.

Raichle, M. E. (1998). Behind the scenes of functional brain imaging: A historical and physiological perspective. Proceedings of the National Academy of Sciences, USA, 95, 765–772.

Ritter, H., & Kohonen, T. (1989). Self-organizing semantic maps. *Biological cybernetics*, *61*(4), 241-254.

Rybnicek, R., Bergner, S., & Gutschelhofer, A. (2019). How individual needs influence motivation effects: a neuroscientific study on McClelland's need theory. *Review of Managerial Science*, *13*(2), 443-482.

Rule, N. O., Moran, J. M., Freeman, J. B., Whitfield-Gabrieli, S., Gabrieli, J. D., & Ambady, N. (2011). Face value: Amygdala response reflects the validity of first impressions. *NeuroImage*, *54*(1), 734-741.

Rybnicek, R., Bergner, S., & Gutschelhofer, A. (2019). How individual needs influence motivation effects: a neuroscientific study on McClelland's need theory. *Review of Managerial Science*, *13*(2), 443-482.

Saad, G., & Vongas, J. G. (2009). The effect of conspicuous consumption on men's testosterone levels. *Organizational Behavior and Human Decision Processes*, *110*(2), 80-92.
Scheepers, D., Derks, B., Nieuwenhuis, S., Lelieveld, G. J., Van Nunspeet, F., Rombouts, S. A., & De Rover, M. (2013). The neural correlates of in-group and self-face perception: is there overlap for high identifiers?. *Frontiers in human neuroscience*, *7*, 528.

Senior, C., & Lee, N. (2008). A manifesto for neuromarketing science.

Senior, C., Lee, N., & Butler, M. (2011). PERSPECTIVE—organizational cognitive neuroscience. *Organization Science*, *22*(3), 804-815.

Senior, C., Lee, N., & Butler, M. (2011). PERSPECTIVE—organizational cognitive neuroscience. *Organization Science*, *22*(3), 804-815.

Sequeira, H., Hot, P., Silvert, L., & Delplanque, S. (2009). Electrical autonomic correlates of emotion. *International journal of psychophysiology*, *71*(1), 50-56.

Skiendziel, T., Rösch, A. G., & Schultheiss, O. C. (2019). Assessing the convergent validity between the automated emotion recognition software Noldus FaceReader 7 and Facial Action Coding System Scoring. *PloS one*, *14*(10), e0223905.

Spisak, B. R., Homan, A. C., Grabo, A., & Van Vugt, M. (2012). Facing the situation: Testing a biosocial contingency model of leadership in intergroup relations using masculine and feminine faces. *The Leadership Quarterly*, *23*(2), 273-280.

Stewart, L., V. Walsh. 2006. Transcranial magnetic stimulation and human cognition. C. Senior, T. Russell, M. S. Gazzaniga, eds. Methods in Mind. MIT Press, Cambridge, MA, 1–27.

Stöckli, S., Schulte-Mecklenbeck, M., Borer, S., & Samson, A. C. (2018). Facial expression analysis with AFFDEX and FACET: A validation study. *Behavior research methods*, *50*(4), 1446-1460.

Tharawadeepimuk, K., & Wongsawat, Y. (2017). Quantitative EEG evaluation for performance level analysis of professional female soccer players. *Cognitive neurodynamics*, *11*(3), 233-244.

Thornton, Patricia H.; Ocasio, William. Institutional logics and the historical contingency of power in organizations: Executive succession in the higher education publishing industry, 1958–1990. American journal of Sociology, v. 105, n. 3, p. 801-843, 1999.

Thornton, Patricia H. Markets from culture: Institutional logics and organizational decisions in higher education publishing. Stanford University Press, 2004.

Thornton, Patricia H.; Ocasio, William; Lounsbury, Michael. The institutional logics perspective. John Wiley & Sons, Inc., 2015.

Thornton, Patricia H.; Jones, Candace; Kury, Kenneth. Institutional logics and institutional change in organizations: Transformation in accounting, architecture, and publishing. In: Transformation in cultural industries. Emerald Group Publishing Limited, 2005. p. 125-170.

Toichi, R.L. Findling, Y. Kubota, J.R. Calabrese, M. Wiznitzer, N.K. McNamara and K. Yamamoto, "Hemodynamic differences in the activation of the pre- frontal cortex: attention vs. higher cognitive process- ing", *Neuropsychologia* 42, 698 (2004)

Waldman, D. A., Balthazard, P. A., & Peterson, S. J. (2011). Social cognitive neuroscience and leadership. The Leadership Quarterly, 22(6), 1092-1106.

Waldman, David A. et al. A neurological and ideological perspective of ethical leadership. Academy of Management Journal, v. 60, n. 4, p. 1285-1306, 2017.

Ward, M. K.; Volk, Stefan; Becker, William J. An overview of organizational neuroscience. In: Organizational Neuroscience. Emerald Group Publishing Limited, 2015. p. 17-50.

Zander, T., Fernandez Cruz, A. L., Winkelmann, M. P., & Volz, K. G. (2017). Scrutinizing the emotional nature of intuitive coherence judgments. *Journal of behavioral decision making*, *30*(3), 693-707.

Zhang, J., & Luo, X. R. (2013). Dared to care: Organizational vulnerability, institutional logics, and MNCs' social responsiveness in emerging markets. *Organization Science*, *24*(6), 1742-1764.

Zheng, W. L., & Lu, B. L. (2015). Investigating critical frequency bands and channels for EEG-based emotion recognition with deep neural networks. *IEEE Transactions on Autonomous Mental Development*, *7*(3), 162-175.

Zyphur, M. J., Narayanan, J., Koh, G., & Koh, D. (2009). Testosterone–status mismatch lowers collective efficacy in groups: Evidence from a slope-as-predictor multilevel structural equation model. *Organizational Behavior and Human Decision Processes*, *110*(2), 70-79.

Zucker, Lynne G. Normal Change Or Risky Business: Institutional Effects On The 'Hazard'of Change In Hospital Organizations, 1959–79 [1]. Journal of Management Studies, v. 24, n. 6, p

# 5. CHAPTER 4 - THINKING OUTSIDE THE BOX TO UNCOVER THE BLACKBOX: MULTIPARADIGM RESEARCH AS BASIS FOR A NEUROINSTITUTIONAL UNDERSTANDING OF ATTENTION

**Abstract**

Attention is influenced by organizational structures and is related to many management activities. It has been a subject of research in several areas, including organizational studies. Ocasio (2011) points out that, despite an increase in these studies, it has not yet led to a cumulative body of work due to different definitions and understandings of the construct itself used in different disciplines. The variety of mechanisms and ways of understanding attention requires a research perspective that can capture more than one nuance of the phenomena. Multiparadigm research allows the use and elaboration of disparate points of view broadening the researchers' understanding of the phenomena employed and, the paradigms adopted. I propose a multiparadigm research to broaden our understanding of attention's role in organization activities. For this, I propose three different research frameworks with distinct paradigms. The frameworks 1 and 2 adopt, respectively, the institutional logics and the cognitive organizational neuroscience assumptions to understand attention in different perspectives. The framework 3 discuss the relationships between social and biological issues related to attention and its implications for organizations. With this analysis proposal, I intend to increase the knowledge on attention with a neuroinstitutional insight bringing theoretical, methodological and ontological contributions.

**Keywords:** multiparadigm research, focus of attention, institutional logics, organizational cognitive neuroscience, critical realism

## 5.1 INTRODUCTION

Attention is one of the most important tasks of the various functions of the human brain and is directly related to cognitive tasks. In our daily life we face situations that require our focus of attention. We always claim or have someone asking for our attention. As in private life, being parents, wives or husbands, or in public/professional life being managers, teachers, students, employees, or customers, we face situations when people attempt to control and

influence others driving their attention. Ocasio and Wohlgezogen (2010) point out that if one desires that a task be done if the individuals` attention is not driven to it, there is a low chance that it will be done.

That is not different in organizational contexts. Attention is directly related to the way that firms behave. Its responses to environmental changes, the decisions and actions that allow the firms to adapt to these changes, are connected to organizations and individuals' attentional capacity (Ocasio, 1997). Prior authors that studied organizations consider the decision-making processes as being part of the organizations daily life and an eminent human activity (Ansoff, 1977; Simon, 1979; Morgan, 1996), and it is directly related to individual's attentional processes. The prior studies concerning the role of attention in organizations started when Simon (1947; 1979) related the limited attentional capability of individuals with organizational decisions.

Organizations structure individuals' focus of attention which directly influences the adaptation to internal and external pressures. Ocasio (2011) proposed an Attention-Based View (ABV) to understand this process and its consequences to organizational life. In other words, ABV focuses on how individual and group attention shape organizational adaptation. The interest in studying the focus of attention has been increasing. Despite this, there are various findings instead of a cumulative body of research that difficult the comparison between research on attention. This difficulty is, mostly, related to the existence of different metatheories and different definitions and understandings of the construct itself used in different disciplines.

Attention is amidst the most studied constructs in cognitive neuroscience and has become an important theme under investigation in management and organization studies (Laureiro-Martinez et al., 2015; Cohen et al., 2004; Ocasio, 2011; Ocasio & Joseph, 2005; Shepherd et al, 2012). This literature points out two different types of attention: automatic and willed or controlled (Norman & Shallice, 1986). Controlled attention is related to brain executive functions and is demanded in activities such as problem solving, non-routine activities, risk situations, decision-making, etc.

Attention is also one of the institutional logics microfoundations proposed by Thorton et al (2013). This perspective highlights the focus of attention as responsible for interpretation and responses to external and internal pressures and is highly influenced by a constellation of logics present in the institutional environment. The way the focus of attention is orientated impacts directly other microfoundations such as decision making, organizational practices and sensemaking. The importance of studying attention within organizations is pointed out by the

authors who claim for further studies that explain the institutional logics capacity of restricting and expanding the focus of attention.

Few researches have been carried out to study the role of institutional logics directing the focus of attention (Ocasio, 1997; Thorton & Ocasio 1999; Thorton 2001; Thorton 2004; Greenwood & Suddaby 2006; Dunn & Jones, 2010; Nigam & Ocasio, 2010; Hulting & Mahring, 2014). However, new studies on attention could deal with recent criticism of this perspective, addressing more directly the microfoundations of Institutional Logics. In addition, the facilitating function of multiple competing logics on the focus of individual or organizational attention has not yet been developed in the literature.

Several studies demonstrated how institutional logics drives organizations to develop structures and processes aiming to shape the individual or group focus of attention affecting action and cognition. However, institutional logics are not the only responsible to guide attention. Environmental stimuli and non-routine organizational events can also attract the individual and group focus of attention and, depending on its importance, can affect action, problem solving, decision making and change organizational practices (Thorton & Ocasio, 1999; Lounsbury, 2007; Thorton, Jones & Kury, 2005; and Cho & Hambrik, 2006).

Achieving a broader understanding of those processes related to action and cognition involved in the organizational phenomena has been an object of organizational research and practice for decades. However, to go beyond what has been discovered so far demands the adoption of perspectives and methods capable of providing new and innovative explanations to phenomena already under study, such as the focus of attention.

The study of how managers think, and the processes involved is object of several areas, which provides a variety of theories and methods to understand the focus of attention. One of the attempts to amplify our understanding of the influence of attention on organizational phenomena is the adoption of physiological and biological explanations through, for example, neuroscience. The use of neuroscience to uncover the enigma involving managers' thinking through cognitive neuroscience began about 30 years ago and it has already an expressive body of work in economics and marketing (Powell, 2011). But how cognitive neuroscience can contribute to management and organizational studies? According to Waldman and Balthazard (2016), cognitive neuroscience studies the functioning of human thought and how it is related to biological functions. As a discipline, it provides explanations about the influence of physical and biological parts of the brain in the creation of less tangible phenomena such as thoughts, emotions, behaviors and memories.

It was the possibility of using concepts and methods of cognitive neuroscience to broader the understanding of organizational phenomena through a multidisciplinary approach in terms of theory and method that culminated in the rising of the organizational cognitive neuroscience (OCN) (Butler, 2016). OCN emerged as being the study of brain processes that are directly related to human decisions, behaviors and interactions within organizations or in response to organizational or institutional pressures and manifestations (Butler & Senior, 2007). With the use of neuroscience in management and organizational studies is possible to enhance the understanding of organizational actors' behavior impacting not only research but also practice once, according to Waldman and Balthazard (2016) it is possible to combine physiological indicators with other methods to reveal the role of neurological processes – attention, for instance – in the organizational routine.

However, combining a variety of mechanisms and ways of understanding the process of attention can be defiant. There are several studies advocating the use of neuroscience in management and organizational studies, proposing methods and techniques. But combining different lenses from different fields demands caution and well-structured research. With this paper I propose the multiparadigm research as a way out for those researchers who desire to capture more than one nuance to explain some organizational phenomena illustrated by a proposal to understand the focus of attention under a neuroinstitutional perspective.

Multiparadigm research allows the use and elaboration of disparate points of view broadening the researchers' understanding of not only the phenomena employed, but also of the paradigms adopted. The researchers can go beyond the paradigmatic dualism and think in a paradoxical way considering, simultaneously, conflicting views of phenomena reflecting the organizational complexity and the conflicts faced by the organizational actors (Lewis & Grimes, 2005).

In order to broaden our understanding of how material and symbolic practices and neurological processes influence attention I propose the adoption of sequential multiparadigm research. In this type of research, the researcher cultivates diverse representations to mutually inform and propose the results of a study under a paradigm that provides subsidies for the next studies. Applying lenses in succession, we will seek to refine distinct but complementary points of view (Lewis & Grimes, 2005). I propose a research agenda with three frameworks addressing three different paradigms that will be discussed in a sequential way where the previous will provide subsidies for discussion of the next ones: Framework 1: The Interpretive Paradigm - Influences of Material and Symbolic Practices on Attention; Framework 2: The Influences of Sociocultural Conditions on The Neurological Processes Related to Attention; Framework 3 -

The Critical Realism Paradigm - Bridging Discourse and Brain Towards a Neuroinstitutional Understanding of Attention.

## 5.2 ATTENTION AND INSTITUTIONAL LOGICS

The earlier definitions of institutional theory used to focus on the institutional pressures suffered by the organizations which responded through an isomorphic behavior. The institutional logics perspective provided a rejuvenated breath to institutional theory emerging as an alternative definition and perspective through the study of Friedland and Alford (1991).

According to the authors, institutional logics can be defined as being "the set of material practices and symbolic constructions" present in a field (p.218). These logics have a symbolic character being organizationally structured, politically defended, technically and materially restrict and has historical limits. The set of principles represented by a constellation of logics can guide how organizations perceive reality, define an appropriated behavior, and build strategies to succeed. These logics guide the organizational interpretation and operation in given situations and, can even be mutually incompatible (Thorton, 2004; Greenwood et al., 2011). Individuals and organizations have a prominent role in the way the logics are interpreted, this perspective highlights the role of agency, structure and interpretation as being inherent to logics.

The conception of interpretation and agency has been brought to the surface of the institutional theory through logics once individuals and organizations are submerged in an institutional network that demands accordance with norms and rules. This needs to be in accordance with rules culminate in logics taking shape on symbolic and action plans. Logics can be shaped by individual actors and even groups. Besides that, institutional logics can be seen as the basis for behavior, values, identities and interests of these actors who are endued of what is called embedded agency (Greenwood & Suddaby, 2006; Thornton & Ocasio, 2008; Thornton, Ocasio & Lounsbury, 2012).

The incorporation of agency in the context of institutional logics inspired Thorton, Ocasio and Lounsbury (2013) to propose an integrative model of institutional logics – Cross-level Model of Institutional Logics – which demonstrates the interrelationships between macro and micro level of analysis. This model of human behavior has its roots in the rational choice theory and structural determinism. The model created by the authors positions the social actors emerged in political, social and cultural structures which are guided by cognitively limited identities and goals.

As mentioned above, embedded agency and institutional contradictions are the roots of the microfoundations proposed by Thorton et al (2013). However, there are other concepts inherent to human behavior that is part of the model drawn by the authors. The Cross-level Model, represented by figure 11, demonstrates the influence of institutional logics in the individual or group's focus of attention through cultural incorporation, activating identities, objectives and action plans and its impact on decision making and consequences to organizational practices.

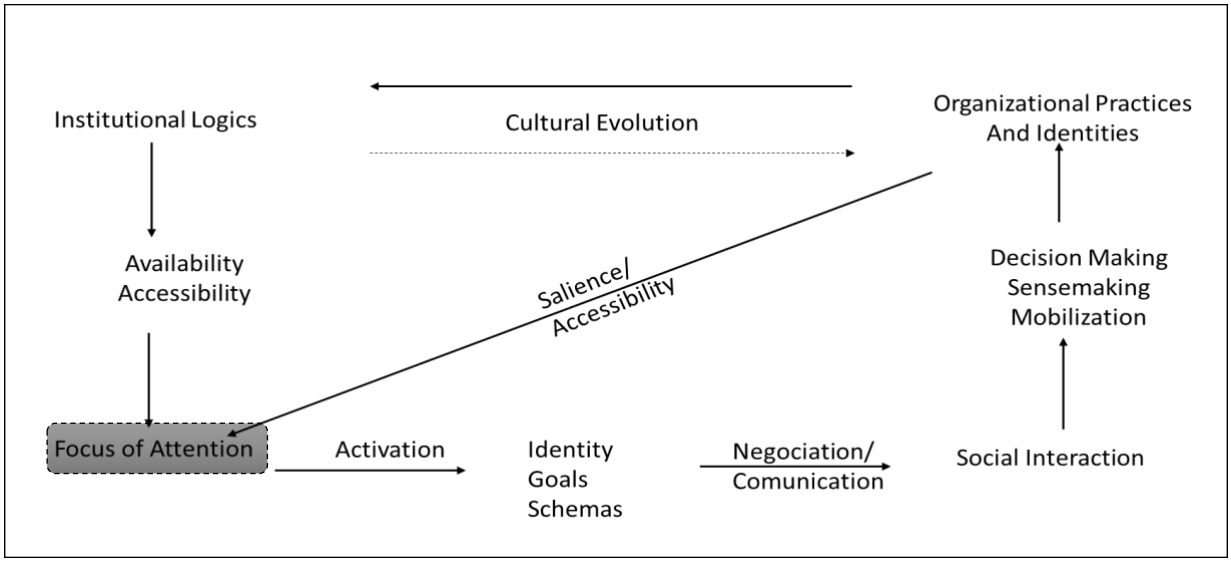


*Figure 10*: A Cross-Level Model of Institutional Logics Combining Macro-Micro and Micro-Macro. Adapted from Thorton, Ocasio and Lounsbury (2012, p.85)

According to the model proposed by the authors, it is possible to assume that the focus of attention, shaped by a constellation of logics, influences all microfoundations once it is responsible for the activation of identities, goals and schemas, negotiation and communication during social interaction that will impact decision making, sensemaking and mobilization, affecting the organizational practice and identity.

However, the individuals' ability to allocate cognitive resources or information processing to any environmental stimulus and/or response to actions is limited. This is the case of attention. The focus of attention is guided by institutional logics that drive the problems and issues that must be addressed, as well as, possible solutions to these problems which limits action and cognition that impacts, directly, decision-making processes. Facing this character of

logics, organizations develop structures and processes in order to shape individual or groups' focus of attention (Ocasio, 2011; Thorton et al, 2013).

The importance of attention to organizational life is highlighted by Ocasio (1997), who proposed an Attention-Based View (ABV) to understand and explain how attention is related to organizational adaptation. ABV defines attention as being "the noticing, encoding, interpreting, and focusing of time and effort by organizational decision-makers on both (a) issues: the available repertoire of categories for making sense of the environment and (b) answers: the available repertoire of action alternatives" (p.189).

The ABV considers the interplay of information processing between organizational and individual level and follows the assumption that organizational cognition, decisions and actions have a distributed nature. Based on the multilevel characteristic of ABV, Ocasio (1997) proposed three metatheoretical principles focusing on how firms distribute and control its decision-makers' attention: focus of attention, situated attention, and structural distribution of attention. Figure 12 shows the level of analysis, definition and characteristics, organizational theory or perspective related to and, examples of studies that used each principle.

| | **Focus of Attention** | **Situated Attention** | **Structural Distribution of Attention** |
|---|---|---|---|
| **Level of Analysis** | Individual | Social Cognition | Organizational |
| **Definition and Characteristics** | Individuals have limited capacity of cognition and will be selective in determine what issues and answers to attend. This selection is related to their focus of attention. | Context guides decision-makers` focus and what they do. The characteristic situations, the situated attention shapes individual behavior. Focus of attention will vary according the situation. | How decision makers attend to the particular contexts they find themselves in depends on how organizations distribute and control the issues that must be addressed. |
| **Organizational Theory/Perspective** | Organizational Cognitive Neuroscience | Institutional Logics perspective. | Strategic Theory of the Firm; Behavioral Theory of the Firm |

*Figure 11* Metatheoretical principles of distribution and controlling of decision-makers'attention
Based on Ocasio (1997)

In order to understand how these three mechanisms are interrelated and build a concept of organizational attention, Ocasio (1997) developed a model of situated attention and firm behavior. The model presents six fundamental components, illustrated in figure 13: 1) the environment of decision; 2) the repertoire of issues and answers; 3) procedure and communicational channels; 4) the firm's attention structures; 5) decision-makers; and 6) organizational rules.

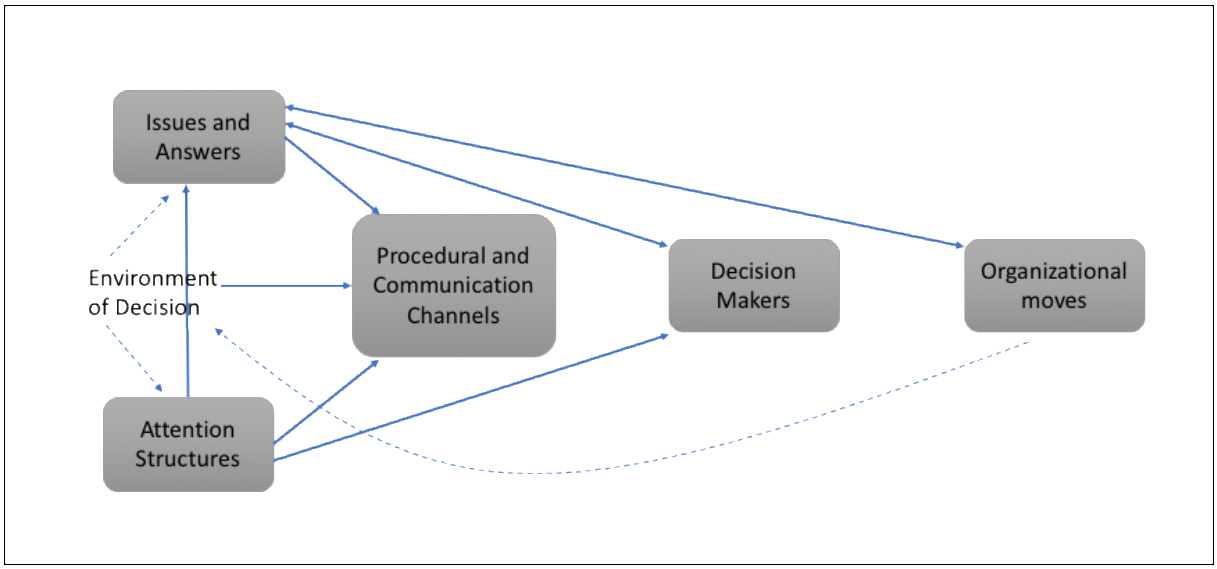


*Figure 12* - Model of situated attention and firm behavior
Adapted from Ocasio (1997)

Attention is also used for controlling in organizations. According to Ocasio and Wohlgezogen (2010), cognitive processes and attention appear to play an important role in many definitions of organizational control. Based on ABV, the authors propose a perspective that combines the literature about organizational control and attention in order to explain how control affects attention in different ways. The systems of control used by organizations influence actors' behavior through attentional processes. To understand the impact of organizational control on individuals' attention, the authors propose five types of control – hierarchical, output, behavioral, cultural and channel controls- and the attentional processes which are impacted by them – attentional selection, regulation and vigilance. Organizational control and attention are also addressed by Stanko and Beckman (2015). Their study describes how organizations control the employees' focus of attention at work to minimize productive and security problems that occur due the use of individuals' attention in non-work activities.

Thorton et al (2013) incorporated the ABV definition of attention to incorporate the role of it in the institutional logics perspective, positioning the focus of attention as one of the microfoundations that constitute the model proposed by them. The importance of the focus of attention to understand how the Cross-level Model works is because it is directly connected to how individuals and groups of actors interpret and respond to pressures arose from multiple logics present in the environment being not only restricted but, also, expanded by those logics.

The focus of attention is driven by two types of attention: top-down and bottom-up. Top-down attention is affected by goals and schema and bottom-up attention by environmental stimuli. Institutional logics and organizations represent a top-down attention process once shape attention according to goals, schemas and rules. On the other hand, prominent features of environment and situations drive bottom-up attention process. Most of research carried down by far focused emphasized the top-down attention focusing on the role of institutional logics and organizations in driving the focus of attention as can be seen in Thorton and Ocasio (1999), Lounsbury (2007), Thorton, Jones and Kury (2005), and Cho and Hambrik (2006). Nevertheless, there is a lack of studies of bottom-up environmental stimuli. Research concerned with bottom-up environmental stimuli accounts that not always individuals and organizations will face situations where existing schemas agree with behaviors and outcomes observed in the environment. In some situations, the bottom-up stimuli not always will be attended to. Rather, it is contingent on the salience of the stimulus.

Ocasio (2011) discusses the need for more studies that demonstrate the interrelationship between these two processes, since most research focuses on institutions and organization guiding attention: top-down processes. However, research has also shown that attention is guided by objectives, task demands, and prior cognitive orientations that lead to automatic responses suggesting the importance of the bottom-up process of attention. In addition, the author talks about the importance of research that addresses a multilevel analysis demonstrating the relationships between individual and organizational attention.

## 5.3 ATTENTION AND ORGANIZATIONAL COGNITIVE NEUROSCIENCE

The term Organizational Cognitive Neuroscience (OCN) can be considered an applied field derived from cognitive neuroscience, which studies how human thought occurs and how it is related to biological functions. Cognitive neuroscience is an attempt to explain less tangible phenomena such as thoughts, emotions, behaviors, attention and memories through physical and biological processes (Waldman & Balthazard, 2016).

With the crescent interest in understanding the managers' thinking and behavior and how it influences the organizational life, Butler and Senior (2007) proposed the OCN perspective. According to Butler (2016) OCN represents a multidisciplinary attempt to combine methods used in cognitive neuroscience with organization and management knowledge to explain organizational phenomena. According to the first definition proposed by Butler and Senior (2007), OCN studies the processes within the brain that are the basis or have influence in human decisions, behaviors and interaction not only inside the organizations but, also, in response to organizational manifestations and/or institutions.

Later, Senior and Butler (2011) completed the former definition that used to restrict the studies to brain processes and amplified the definition considering the interaction between brain systems and cognitive mechanisms that are related to the mediation of human behavior responses to organizational manifestation and institutions.

One of the most important characteristic of OCN is its multidisciplinary approach, not only in terms of method, but in terms of theory as well. OCN goes beyond the study of managers' brain functions incorporating concepts and prior knowledge about the functioning of the human brain system to develop propositions about organizational phenomena (Butler, 2016).

The combination of prior cognitive neuroscience knowledge with organization and management studies allows the creation of new hypothesis about relevant organizational phenomena. The incorporation of neuroscience through OCN provides a broader scope that, using an interdisciplinary approach, can contribute to both organizational and cognitive neuroscientific knowledge (Senior & Butler, 2011).

Attention is one of the constructs studied both in cognitive neuroscience (e.g. Caruana et al, 2017; La Rocque et al, 2017; Rothmaler et al, 2017) and organization and management studies (e.g. Hoffman & Ocasio, 2001; Nigam & Ocasio, 2010; Shepherd et al, 2007). The adoption of OCN enables researchers to uncover the implications of the focus of attention to the organizations under different perspectives providing a broad spectrum of analysis of these phenomena taking into account the different nuances of the organizational life.

Even being an object constantly under study in cognitive neuroscience and organization and management studies, attention still remains as an uncovered theme in OCN. One of the reasons may be the elusive character of the construct. Attention is permeated by a large amount of different processes and mechanisms, occurring in different ways within the human brain making it impossible to determine a single definition.

This variety of concepts and processes related to attention demands a careful selection of what phenomena will be under study in order to define a suitable type of attention process and mechanisms to be under investigation (Cohen et al., 2004). Ocasio (2011) highlights three types of attention most used in studies involving brain functions: selective attention, attentional vigilance and executive attention. Those three types can produce fruitful findings when used to better understand the organizational phenomena. Selective attention occurs when "(…) individuals focus information processing in a specific set of stimuli at a moment in time." (INSERIR A PÁGINA) Because of limitations in cognition the brain cannot process all information and individuals must select which stimuli to attend and which to screen out. Attentional vigilance is "(…) the process by which individuals sustain concentration on a particular stimulus (e.g. waiting for a particular sign to occur or change)." This type of attention is limited in duration. Executive attention "(…) is central to planning, problem solving, conflict resolution and decision-making". This form of attention is responsible for guiding cognition and action when there is a conflict among goals and enables individuals to process multiple goals.

Table 1 classifies, according to Ocasio (2011), organizational uses of attention and some examples of studies in organization and cognitive neuroscience studies for helping researchers to identify which phenomena and mechanisms can be employed to study the focus of attention combining an OCN perspective with institutional theory.

Tabela 3: *Types of attention and suggestions for use in an OCN perspective*

| Types of attention | Organizational uses | Example of organizational studies that addressed attention | Example of cognitive neuroscience studies that addressed attention |
|---|---|---|---|
| Selective Attention | Studies involving conflict resolution, multiple competing goals, interpretation, sensemaking, decision-making | Thorton and Ocasio (1999); Hoffman and Ocasio (2001); Bouquet and Birkinshaw (2008); Hansen and Haas (2001) | Naatanen and Winkler (1999); Dawson et al (2005); Dehaene et al (2014); Van Boxtel et al (2010); Stevens and Bavelier (2012) |
| Attentional Vigilance | Specific tasks limited in duration. | Nadkarni and Barr (2008) | Katona e Kovari (2018) |
| Executive Attention | Problem solving, decision-making, conflict resolution, organizational behavior | Eggers and Kaplan (2009); Kaplan (2008) | Kane and Engle (2012); Knight and Mather (2013); Yue et al (2017) |

Based on Ocasio (2011)

It is important to define what type of attention will be under study once the difference between definitions has different implications for the organization and management studies and the phenomena that is being investigated. For instance, Ocasio (2011) exemplifies that studies that linked selective attention to environmental stimuli (e.g., Daft & Weick 1984, Barr et al. 1992, Corner et al. 1994) do not consider other components involved in the attention process such as conflict resolution, decision-making and problem-solving.

Even without a unitary attention concept, studies addressing attention to understand managers' cognition and organizational behavior using the cognitive neuroscience perspective can contribute to both fields. It is known that there is an increase in neuroscientists interest in macro-level and context and its impacts on brain processes related to attention (Laureano-Martinez et al., 2015). At the same time, organization and management studies, specifically, institutional theory, has faced a growing interest in agency and the role of the individual in the maintaining or changing of institutional logics. With the combination of these two perspectives it is possible to broader our understanding of the role of attention in a multi-level and multidisciplinary analysis. OCN enables this achievement once studies using this perspective must consider not only the individual, but also the context involved, which indicates that institutional theory can be a fruitful perspective to be linked with organizational cognitive neuroscience.

In order to guide researchers who want to apply different such different lenses to understand organizational phenomena, here represented by the study of attention, I propose the multiparadigm research. Next, I explain the multiparadigm research, its characteristics and I illustrate how to use it, in practice, to build a Neuroinstitutional understanding of attention.

## 5.4 MULTIPARADIGM RESEARCH

Multiparadigm research allows scholars to use in their researches, insights from different fields. In organizational studies it is possible to combine approaches from sociology, psychology, economics, and, also, other disciplines outside the management field. Furthermore, management is a complex phenomenon that demands explanations capable of filling this complexity from a combination of perspectives. (Gioia & Pitre, 1990; Okhuysen & Bonardi, 2011). It's important to state that multiparadigm research doesn't have the objective to reveal the truth, but, to attempt providing a more comprehensive and complete view of a phenomenon. According to Gioia and Pitre (1990),

> multiparadigm approaches offer the possibility of creating fresh insights because they start from different ontological and epistemological assumptions and, therefore, can tap different facets of organizational phenomena and can produce markedly different and uniquely informative theoretical views of events under study (p. 591).

Schultz and Hatch (1996) argued that organization and management scholars constantly face a variety of paradigms which allows the distinction of three metatheoretical positions in a research adopting a multiparadigm approach: a) paradigm incommensurability, b) paradigm integration, and c) paradigm crossing.

Paradigm incommensurability is related to a research that develops and applies each paradigm separately. It is important to distinguish the idea of paradigm incommensurability used in the application of multiple paradigms – which started to be proposed and used in organization and management studies by Burrell and Morgan (1979) – from the paradigm incommensurability discussed by Kuhn (1970), which is related to the paradigm revolution ideas. According to to Burrell and Morgan's paradigm incommensurability ideas, the differences between ontology, epistemology, and methodology, besides the differences between conceptions of human nature, build barriers that cannot be transposed by the different paradigms. According to these assumptions, it is impossible to connect the ideas and concepts from different views of reality and organizational phenomena to build new theories.

Paradigm integration is a multiparadigm research approach proposed by Willmott (1993) and Reed (1985). This approach ignores the difference between perspectives and allows the research the approximation between competing theories. This position offers the possibility of the construction of a framework that combines arguments and concepts from different theories and assumptions without, necessarily, the existence of relationships between the theories, perspectives or assumptions (Schultz & Hatch, 1996).

Paradigm crossing is the possibility of confronting multiple paradigms and their assumptions instead of mixing them as in a paradigm integration or refusing to integrate them as in the paradigm incommensurability.

According to Okhuysen and Bonardi (2011), management is full of phenomena that are prone to be studied using more than one theoretical approach, due to their complexity. An explanation that matches this complexity requires complex analyzes that can be drawn from the combination of different perspectives. The authors highlight the fact that multiple-lens

explanations increase the management field, which claims for studies and research that matters, that are relevant to our field, and that really reflect the reality of management, since managerial decisions in private and public organizations affect millions of people in the world.

The multiparadigm research allows the use and elaboration of disparate points of view broadening the researchers' understanding of not only the phenomena employed, but also of the paradigms adopted. This perspective of research requires that the researchers go beyond the paradigmatic dualism and think in a paradoxical way considering, simultaneously, conflicting views of phenomena reflecting the organizational complexity and the conflicts faced by the organizational actors, going back and forth between the paradigms chose (Shultz & Hatch, 1996; Lewis & Grimes, 2005).

To apply multiparadigm research is necessary an overture of the researcher who seeks to understand the phenomenon using more than one philosophical approach. Bechara and Van de Ven (2011) point out that the character of religion adopted by some scholars in relation to their research can compromise the understanding of the complexity of a phenomenon. The authors acknowledge the problem of the incommensurability of philosophies, once they rely on different ontological, epistemological and methodological assumptions. However, according to them, triangulating philosophies can reveal interdependence among the aspects of the organizational phenomena and shed light on the reductionism of privileging only one aspect of the problem that is being studied.

Multiparadigm research enables scholars to comprehend not only the interaction among paradigms, but also their disparities, providing a broader understanding of the phenomena and the paradigms itself (Lewis & Grimes, 2005). Thus, the option for a multiparadigm research contributes not only to a richer understanding of the influence of the material and symbolic issues in decision-making but also of the use of the OCN to understand this influence and the implications of bridging the social and the neuroscientific paradigm.

A multiparadigm research can be conduct through parallel studies or sequential studies. Parallel studies allow the researcher to preserve theoretical conflicts by describing voices, images, and organizational interests magnified by opposing lenses. In this approach, different paradigms are applied on equal terms at the same time in a study which can enrich organization and management field with a diversity of ways to describe a phenomenon, including the possibility of highlights the differences, conflicts and inconsistences between paradigms. (Schultz & Hatch, 1996; Lewis & Grimes, 2005).

In sequential studies the researcher cultivates diverse representations to inform each other, purposively, the results of a study under a particular paradigm that provide inputs for

subsequent studies. Applying lenses in succession, theorists seek to refine their distinct but complementary points of view (Lewis & Grimes, 2005).

Researchers who choose a multiparadigm research go beyond the existent literature reviews and use, empirically, lenses of divergent paradigms. The multiple paradigms are used to collect and analyze data, and to understand the varied representations of a phenomenon. I advocate this research type as a practical and suitable model to conduct a research combining such different paradigms as the institutional logics perspective and organizational cognitive neuroscience.

## 5.5 DIFFERENT PARADIGMS TO THEORY BUILDING ON ATTENTION

Although both, sequential and parallel studies, can be used to blend institutional logics perspective and OCN, I propose here a sequential approach to illustrate how to apply those perspectives to achieve a broader understanding of the role of attention in organizations. The results of the framework 1 give support for the elaboration of settings that will be used in framework 2. The framework 3 combines the results of frameworks 1 and 2 providing a discussion about the interactions and disparities of bridging the social and the neuroscientific paradigms to comprehend the focus of attention.

**Framework 1 - The Interpretive Paradigm - Influences of Material and Symbolic Practices on the Focus of Attention -** Framework 1 follows the interpretive assumption. According to Burrell and Morgan (1979), this position assumes that social reality is not given in concrete form but comes from the construction based on subjective and intersubjective experience of individuals. In addition, Gephart (2004) points out that an interpretive research aims at understanding the construction of meanings and concepts that are used by social actors within the context in which they interact.

The theoretical approach which guides this framework (institutional logics perspective) adopts the human being as a social being which creates meaning and gives meaning to his words. One of the proposals of the theory is related to the possibility of a description of how the system of meaning of a group is generated and sustained. According to Neuman (1994), theories that present this characteristic demand an interpretive positioning on the part of the researcher. The evidence in an interpretive social science, still according to the author, is incorporated in the context of social interactions, a context that will be studied through the research proposed.

The data can be collected through in-depth interviews, focus groups, nominal group technique, secondary data gathering, etc. Using interpretive methods (i.e., narrative analysis and social discourse analysis) is possible to capture the complexity of the meanings that are part of the organizational context, arising from the construction of meanings presented in individual, group and, institutional and relations.

I propose the adoption of the Discourse Analysis as an example of how to use the information collect under the institutional logics perspective to pave the way for the next paradigm. Discourse Analysis carries a concern to analyze not the content, but the meaning of the material collected, that is, seeking the effects of meaning that are related to the discourse manifested by the subject, in which silence or what was not explicitly said, present as much sense as narrative (Orlandi, 2001). According to Caregnato and Mutti (2006), the analysis of the discourse provides an understanding beyond the text that considers the discursive position of the subject, which is socially legitimized through the junction of social, history, and ideology, resulting in senses.

Orlandi (2001) points out that discourse analysis contributes to organizational studies, once it provides to researchers a data analysis technique that focuses on the complexity of the meanings that are part of the organizational context, arising from the construction of meanings presented in individual, group and, institutional and relations.

I propose the adoption of the perspective of discourse analysis concerning the social interpretation of discourses. The analysis of the discourse in sociological terms seeks to organize the reconstruction of the senses in a context of micro and macrosocial enunciation. One observes with this method how reality constructs discourses and, in turn, how these discourses construct reality. Because it is a contextual analysis in which the arguments gain meaning from their relationship with the actors who enunciate them, the sociological analysis of discourse departs from the text. Language is not examined in an abstract way as an isolated phenomenon, but rather, considering the relations with situations that may be social, organizational, psychological or interactive, that is, the context (Alonso, 1998; Rodrigues, 2000). According to the social interpretation of the discourses, the context is composed of three categories, based on Firth (1964), which will be used in this research:

a) the relevant characteristics of the participants, considering their verbal action and non-verbal action;

b) the relevant objects, represented by the categories Institutional Logics;

c) the effect generated by the verbal-action, represented by the interpretation of the logics and its role in the focus of attention and, consequently, in the decision-making.

The organizational context can be constituted by the intersubjective scenario of the conversation, which will unite the elements that will underpin the interpretation. This context has as subjective characteristic, institutional and social inputs.

To conduct the analysis, it is necessary, as explained by Alonso (1998), comings and goings to the materiality of the text, the context in which the discourse was produced and the characteristics of the social group in which the actors are part. The planning for the analysis can take place in three levels of approximation, based on Ruiz (2009):

a) Textual: composed by both content analysis and semiotic analysis. This level of analysis can be used to characterize the institutional context in which the organization is embedded through secondary data.

b) Contextual: understanding the meaning of the discourse focusing on the discourses interpretation of the actors involved in social situations. At this level should be done the critical analysis of discourse;

c) Sociological interpretation: the sociological analysis of discourse can be finalized through the understanding of the sociological construction of the studied reality, which in this example of research is constituted by the influence of material and symbolic questions, represented by the institutional logics, in guiding the focus of attention in decision-making.

To evaluate the validity and reliability of the research, a triangulation of the data obtained through non-participant observation, documentary analysis, and in-depth interviews should be conducted. In this way, it is possible to compare points of view and experiences between the objects. In addition, according to Shenton (2004), the development of prior familiarization with the culture of the participating organizations, which must be obtained prior to data collection through, for example, document consultation and preliminary visits to the organization, adds credibility to the research. This familiarization can be carried out through an exploratory incursion that will enable the understanding of the dynamics of the organization studied and the selection of the participants.

As proposed by Shenton (2004), tactics that help to ensure honesty on the part of informants should also be employed: application of rapport techniques, and explanation to participants that there is no right or wrong response, to make them comfortable for giving up at any time.

With the results of framework 1 is possible to draw settings that will be used in simulations of decision making situations that demand focus of attention.

**Framework 2 – The Neurological Paradigm - Influences of Sociocultural Conditions on The Neurological Processes Related to The Focus of Attention –** As mentioned before, the context is relevant for studies that aim to achieve an effective use of neuroscience to understand organizational phenomena. Ashkanasy et al. (2014) point out that considering the context in neuroscientific studies could bring a new perspective about one of the interplay between the individual and the context.

The results of framework will provide the research the necessary resources to build settings considering the context and reality of the organization and individuals under study. With the settings constructed, the next step is to define the most appropriate technique to be used to obtain the information about attention under an OCN perspective.

Functional neuroimaging, electrophysiology and other methods used in cognitive neuroscience research are becoming popular in the sciences like psychology, psychiatry and other neurology departments. Other fields that include disciplines like mathematics, sociology, and management also are using these techniques for understanding brain functioning.

There are a variety of methods and techniques that can be employed. Once it is not the main purpose of this article, table 2 briefly describe some of the techniques available and some sources where the researcher can find its application more detailed.

Tabela 4: *Most used techniques to study focus of attention*

| **Method** | **Description** | **Invasiveness/safety** | **Strengths** | **Limitations** | **Examples of studies that applied the technique** |
|---|---|---|---|---|---|
| MRI | Functioning Magnetic Resonance Imaging (fMRI) based on vascular and neural activities acting on the magnetic properties of hemoglobin. Blood flow is changed by neural activities. | ? | It is possible to measure activities in the entire brain providing a broad foundation for inferences about brain activity integrating different regions of the brain. Best spatial revolution. | Poor temporal resolution. Studies are limited to tasks that can be performed at a scanner. It is not possible to capture the real life of organizations. | Rule et al (2011); Boyatizis era k (2012); Jack et al (2013). |
| NIRS | Functional Near Infrared Image measures local changes in cerebral hemodynamics | | High temporal resolution and possibility to use portable devices | | Toichi et al (2004); Jourdan et al (2009); Kojima and Suzuki (2010) |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| EEG | q | Electroencephalograph (EEG) shows the electrical activity of the brain cells. | + | + | Its use involves no health risks and is much less expensive than other modalities. One of the advantages of the EEG is because the individual can do various tasks, facilitating the study of behavior within organizations, especially because of its strong temporal resolution. | Measuring can be influenced by others electrical currents. Cannot spatially localize activity in the manner that fMRI or PET can. | Handy (2005); Balthazarder al (2011); Hanna et al (2013) |
| Eye Tracker | E | Glasses that produce gaze path video | + | + | It is possible to gather large quantities of rich data related to attention and emotion. | May be necessary a combination with other techniques to obtain relevant information to organization studies | Khushaba er al (2012); Nermend (2017); Jia and Tyler (2019). |

I am aware about the lack of intimacy of organization and management scholars with cognitive neuroscience. However, I would like to highlight the multidisciplinary character of OCN. Thorton et al (2013) as well as Butler (2016) and Senior and Butler (2011) emphasize the necessity of approximation between scholars from different fields to produce studies that can comprise different views from different phenomena. This approximation contributes to both fields once brings different perspectives to answer a research inquiry.

However, positioning a research that brings the use of neuroscience into organizational studies requires caution, especially due to the union of natural science with social science with the adoption of a posture in which social reality is not given in concrete form but, instead, comes from construction based on a subjective and intersubjective experience of individuals. The framework 3 aims to bring not only theoretical contributions but also to encourage ontological discussions about the combination of natural and social sciences for understanding organizational phenomena.

**Framework 3 - The Critical Realism Paradigm - Bridging Discourse and Brain Towards a Neuroinstitutional Understanding of The Focus of Attention -** To understand how material and symbolic practices and neurological processes, combined, influence the focus of attention in organizations, the discussion of this framework could be supported by the Critical

Realism assumptions. It is important to say that it possibilities the discussion not only about the interrelations between the paradigms but also the possible inconsistences of putting them together in the same analysis.

As mentioned before, a researcher who will attempt to use neuroscience in the organization and management studies must be cautious and aware of ontological and epistemological implications, mainly because it concerns the union between natural science with a social science that considers the construction of the reality based on a subjective and intersubjective experience of individuals.

Even with a short history, the field of organization and management has been always facing intellectual redirections, inversions and reversions and is constantly permeate by the so call "turns" (Reed, 2005). The neurological turn is one of the last perspectives being adopted by organization and management scholars. Even being a promising way to bring new insights about individual and, consequently, organizational behavior, the use of neuroscience divides opinions about its contributions and possible pitfalls of using a natural science to explain social phenomena. Some scholars consider the use of neuroscientific knowledge as a fashion that can be a distraction, especially due to the reductionism in explaining complex social phenomena at a neurological level (see Lindebaum, 2013; Lindebaum & Zundel, 2013; McLagan, 2013).

Indeed, the misunderstanding of the OCN assumptions allied to a rush to produce innovative research through the application of neuroscience can lead to a mere hysteria of putting managers in brain scans without producing relevant results. Besides that, Healey and Hodginknson (2014) shed light on an important risk: the lack of a philosophical base that can support the combination between neuroscience and organization and management studies may produce studies with poor conclusions and confusions. Producing studies that can provide theoretical and empirical developments and benefit from neuroscience means keeping in mind the socially embedded nature of organizational life and ensure a strong philosophical base to support such blending of sciences. For these reasons, the authors propose the adoption of critical realism as a philosophical foundation to studies that will engage with the OCN perspective.

Based on Healey and Hodginknson (2014) ideas to avoid philosophical pitfalls and epistemological errors, I propose the framework 3 as a critical realist bridge to connect discourse and brain towards a neuroinstitutional understanding of attention. The use of critical realism as a foundation to an epistemological and ontological framework enables the research to posit neurophysiological processes as one of the various mechanisms that are the basis for explaining individual behavior, what it influences and is influenced by and the consequences to organizations. Besides that, the adoption of a philosophical position that lies between

objectivism and (radical) social constructivism can avoid the risk of reductionism, so criticized by some scholars that are contrary to the OCN.

The insistence on independent material reality defines critical realism, but also a negation of the direct correspondence between knowledge related to the material reality and reality itself (Bhaskar, 2013).

For that, Bhaskar (2013) provides a fundamental and comprehensive distinction between the intransitive and transitive dimensions - or objects - of knowledge which allows the coexistence of competing knowledge to explain a same phenomenon. The intransitive dimension refers to the objects of science that exist independent of the human conception, that is, what we are studying (physical processes, such as light, neurons, iodol; or social phenomena, for example, unemployment, leadership). The transitive dimension encompasses theories and sciences that aims to explain the intransitive dimension (theories, paradigms, models). In this way, rival theories and sciences may have different transitive objects to explain the same intransitive dimension. (Sayer, 2000; Bhaskar, 2013; Healey & Hodginknson, 2014).

From this point of view, Bhaskar (2013) proposes three stratifications of reality: the separation between the real, the actual and the empirical: (i) the "real" world of causal powers, which contains deep structures and generative mechanisms that originate real events; (ii) the actual, that is, the flow of events produced as natural states of things or under controlled conditions; and (iii) empirical events, known directly or indirectly through observation and experience.

It is not always possible to observe the real or, sometimes, it is not primordial to observe it. In some cases, one can observe the real, such as an organizational structure and the effects produced by its action, but in other cases it is not possible. Although observing the real enables the researcher to be more confident about its existence, its existence is not dependent on observation. Therefore, instead of solely trusting observation, realists accept the causal criteria. Thus, Healey and Hodginknson (2014) argue that, pragmatically, this stratification allows the coexistence of competing knowledge. Our proposal of a multiparadigm research can be seen as an example of it. The existence of institutional logics cannot be observed, but its presence produces effects on individuals and organizations that can be observed and studied, such as its influence in focus of attention. The institutional logics – considered the intransitive dimension - affect the focus of attention which can explained under more than one lenses - transitive dimension; for instance, interpretive methods and neuroscience. Such characteristics support the choice of critical realism as a framework of discussion about the possibilities of

using OCN and interpretive methods to explain the impact of social conditions on the focus of attention through the institutional logics perspective.

Furthermore, social phenomena exist because there are biological processes that enable it (Bhaskar, 2013). Thus, social action depends on individual physiological basis, which includes the signals sent and received by our neural cells. It is important to clarify that the author emphasizes that these are not the unique condition for action, conversation and interaction. Consider that neurophysiological processes are sufficient to explain social phenomena may drive the research to reductionist conclusions of phenomena. In other words, adopting a critical realist view does not mean a complete naturalist position. On the contrary, even though the social sciences might apply techniques and concepts from natural science, it is primordial that the researcher adopts an interpretive understanding of the object under study due to the complexity of the social phenomena (Sayer, 2014).

Critical realism posits that people and structures are analytically dissociable by virtue of their emerging properties. Archer (1995) presents three modalities of these emerging properties: i) emerging structural properties; referring to material domain; ii) emerging cultural properties; referring to domain of the beliefs and systems of knowledge, which cannot be reduced to individual level and, iii) emerging personal properties; referring to the individual (psychological and biological features), to the agents (represented by groups), and to the actors (who take a role in the group). Using critical realism to understand the influence of material and symbolic issues on the focus of attention and allows us a discussion based on the three modalities of emerging properties proposed by Archer (1995).

Bridging discourse and brain functioning to understand the influence of material and symbolic issues on the focus of attention through a multiparadigm research requires a discussion that attempts to provide a broader understanding of the phenomena and encourage ontological debate about the use of critical realism to understand organizational reality.

## 5.6 DISCUSSION AND CONCLUSIONS

Our intent with this proposal is to demonstrate how an effort in theory building could expand our knowledge about how material and symbolic practices and neurological processes influence attention in organization through a multiparadigm research. The multiparadigm research allows the researcher to use and combine multiple paradigms or lens of analysis to better understand some phenomena.

According to Okhuysen and Bonardi (2011), management is full of phenomena that can, often, be studied using more than one theoretical approach. The influence of the focus of attention in organizational actions is one of those phenomena and has being a research interest in many areas, including organizational studies and OCN. Using a multiparadigm research it is possible to study those phenomena through a complex analysis that can be drawn from the combination of different perspectives. The authors highlight the fact that multiple-lens explanations provide different and, sometimes, contradictory views, increasing the management field which claims for studies and research that matters, that are relevant to our field and that really reflect the reality of management once the managerial decisions in private and public organizations affect millions of people in the world.

With the three frameworks proposed it will be possible to broader the knowledge about attention in organizations. With the results of framework 1, it will be possible to provide theoretical contributions related to attention in the microfoundations model of institutional logics perspective and, will serve as a subsidy for framework 2, which will study the focus of attention at the individual level, which means, what happens inside the "black box" of individuals within organizations, using the OCN.

Once it's a new field, OCN needs further empirical research searching for filling the gaps of methodological and conceptual limitations (Healey & Hodgkinson, 2014). Although the short life of the field, the contributions of OCN for a more comprehensive understanding of the nature of human sociability in organizational contexts is recognized and it will help to develop models to help decisions (Saad & Vongas, 2009; Butler, 2016). Framework 2 aims to provide theoretical and methodological contributions for the organizational studies and OCN.

To enhance the discussion about combining different methods to explain the same social phenomena, I propose framework 3, which will base the discussion following the assumptions of critical realism. This perspective read a common epistemological ground for the physical and social sciences retaining a unique ontology to the transitive objects of the study of the social sciences. The metatheory status of critical realism provides explanatory mechanisms that are common to all sciences providing an ideal way for the link between neuroscience and organizational studies and enhancing ontological discussions about the use of this perspective to understand organizational phenomena. Thus, framework 3 aims to bring not only theoretical contributions but also to encourage ontological discussions about the combination of natural and social sciences for understanding organizational phenomena.

As mentioned above, our proposal seeks to add the micro aspects of institutions, specifically the focus of attention, in a novel way that could help the development of a more "holistic" view about the dynamics of organizational life.

REFERENCES

Alonso, L. H. La Mirada Cualitativa en Sociología. Madrid: Fundamentos, 1998

Ashkanasy, N. M., Becker, W. J., & Waldman, D. A. (2014). Neuroscience and organizational behavior: Avoiding both neuro-euphoria and neuro-phobia. Journal of Organizational Behavior, 35(7), 909-919.

Balthazard, P. A., Waldman, D. A., Thatcher, R. W., & Hannah, S. T. (2012). Differentiating transformational and non-transformational leaders on the basis of neurological imaging. The Leadership Quarterly, 23(2), 244-258.

Balthazard, P. A., & Thatcher, R. W. (2015). Neuroimaging modalities and brain technologies in the context of organizational neuroscience. In Organizational neuroscience (pp. 83-113). Emerald Group Publishing Limited

Bhaskar, Roy. A realist theory of science. Routledge, 2013.

Bechara, J., & Van de Ven, A. H. (2011). Triangulating philosophies of science to understand complex organizational and managerial problems. In *Philosophy and organization theory* (pp. 343-364). Emerald Group Publishing Limited.

Boyatzis, R. E., Passarelli, A. M., Koenig, K., Lowe, M., Mathew, B., Stoller, J. K., & Phillips, M. (2012). Examination of the neural substrates activated in memories of experiences with resonant and dissonant leaders. *The Leadership Quarterly*, *23*(2), 259-272.

Butler, Michael Jr; Senior, Carl. Toward an organizational cognitive neuroscience. Annals of the New York Academy of Sciences, v. 1118, n. 1, p. 1-17, 2007

Butler, Michael JR et al. How Organizational Cognitive Neuroscience Can Deepen Understanding of Managerial Decision-making: A Review of the Recent Literature and Future Directions. International Journal of Management Reviews, v. 18, n. 4, p. 542-559, 2016.

Butler, M. J. (2017). Organizational cognitive neuroscience–potential (non-) implications for practice. Leadership & Organization Development Journal, 38(4), 564-575.

Caregnato, Rita Catalina Aquino; MUTTI, Regina. Pesquisa qualitativa: análise de discurso versus análise de conteúdo. Texto contexto enferm, v. 15, n. 4, p. 679-84, 2006.

Cohen, J. D., Aston-Jones, G., & Gilzenrat, M. S. (2004). A Systems-Level Perspective on Attention and Cognitive Control: Guided Activation, Adaptive Gating, Conflict Monitoring, and Exploitation versus Exploration.

Dawson, G., Webb, S. J., & McPartland, J. (2005). Understanding the nature of face processing impairment in autism: insights from behavioral and electrophysiological studies. *Developmental neuropsychology*, *27*(3), 403-424.

Dehaene, S., Charles, L., King, J. R., & Marti, S. (2014). Toward a computational theory of conscious processing. *Current opinion in neurobiology*, *25*, 76-84.

Firth, J. R. Papers and Linguistic. London: Oxford University Press, 1964.

Friedland, Roger; Alford, Robert R. Bringing society back in: Symbols, practices and institutional contradictions. 1991.

Friedman, Jared et al. Antagonistic neural networks underlying organizational behavior. In: Organizational Neuroscience. Emerald Group Publishing Limited, 2015. p. 115-141.

Gioia, D. A., & Pitre, E. (1990). Multiparadigm perspectives on theory building. *Academy of management review*, *15*(4), 584-602.

Greenwood, R., Díaz, A. M., Li, S. X., & Lorente, J. C. (2010). The multiplicity of institutional logics and the heterogeneity of organizational responses. *Organization Science*, *21*(2), 521-539.

Greenwood, Royston et al. Institutional complexity and organizational responses. Academy of Management annals, v. 5, n. 1, p. 317-371, 2011.

Greenwood, Royston; Suddaby, Roy. Institutional entrepreneurship in mature fields: The big five accounting firms. Academy of Management journal, v. 49, n. 1, p. 27-48, 2006.

Handy, T. C. (2005). Event-related potentials: A methods handbook. Cambridge, MA: MIT Press.

Hannah, S. T., Balthazard, P. A., Waldman, D. A., Jennings, P. L., & Thatcher, R. W. (2013). The psychological and neurological bases of leader self-complexity and effects on adaptive decision-making. Journal of Applied Psychology, 98(3), 393.

Healey, Mark P.; Hodgkinson, Gerard P. Rethinking the philosophical and theoretical foundations of organizational neuroscience: A critical realist alternative. Human Relations, v. 67, n. 7, p. 765-792, 2014.

Jack, A., Boyatzis, R. E., Khawaja, M., Passarelli, A. M., & Leckie, R. (2013a). Visioning in the brain: An fMRI Study ofinspirational coaching and Mentoring. Social Neuroscience, 8(4), 369–384.

Jia, Y., & Tyler, C. W. (2019). Measurement of saccadic eye movements by electrooculography for simultaneous EEG recording. *Behavior Research Methods*, *51*(5), 2139-2151.

Jourdan Moser, S. Cutini, P. Weber and M.L. Schroeter, “Right prefrontal brain activation due to Stroop interference is altered in attention-deficit hyperactivity disorder—A functional near-infrared spectroscopy study”, *Psychiatry Res.* 173, 190 (2009). doi: 10.1016/j.pscychresns.2008.10.003

Kane, M. J., Bleckley, M. K., Conway, A. R., & Engle, R. W. (2001). A controlled-attention view of working-memory capacity. *Journal of Experimental Psychology: General, 130*(2), 169.

Kane, M. J., & Engle, R. W. (2002). The role of prefrontal cortex in working-memory capacity, executive attention, and general fluid intelligence: An individual-differences perspective. *Psychonomic bulletin & review*, *9*(4), 637-671.

Knight, M., & Mather, M. (2013). Look out—it's your off-peak time of day! Time of day matters more for alerting than for orienting or executive attention. *Experimental aging research*, *39*(3), 305-321.

Khushaba, R. N., Greenacre, L., Kodagoda, S., Louviere, J., Burke, S., & Dissanayake, G. (2012). Choice modeling and the brain: A study on the Electroencephalogram (EEG) of preferences. *Expert Systems with Applications*, *39*(16), 12378-12388.

KojimaandT.Suzuki,"Hemodynamicchangein occipital lobe during visual search: Visual attention allocation measured with NIRS", *Neuropsychologia* 48, 349 (2010).

Laureiro-Martínez, D., Venkatraman, V., Cappa, S., Zollo, M., & Brusoni, S. (2015). Cognitive Neurosciences and Strategic Management: Challenges and Opportunities in Tying the Knot The first and second authors contributed equally. In *Cognition and Strategy* (pp. 351-370). Emerald Group Publishing Limited.

Lewis, M. W., & Grimes, A. J. (2005). Metatriangulação: a construção de teorias a partir de múltiplos paradigmas. *RAE-Revista de Administração de Empresas*, *45*(1), 72-91.

Lounsbury, Michael. A tale of two cities: Competing logics and practice variation in the professionalizing of mutual funds. Academy of management journal, v. 50, n. 2, p. 289-307, 2007.

Minas, R. K., Potter, R. F., Dennis, A. R., Bartelt, V., & Bae, S. (2014). Putting on the thinking cap: using NeuroIS to understand information processing biases in virtual teams. *Journal of Management Information Systems*, *30*(4), 49-82.

Näätänen, R., & Winkler, I. (1999). The concept of auditory stimulus representation in cognitive neuroscience. *Psychological bulletin*, *125*(6), 826.

Nermend, K. (2017). The implementation of cognitive neuroscience techniques for fatigue evaluation in participants of the decision-making process. In *Neuroeconomic and Behavioral Aspects of Decision Making* (pp. 329-339). Springer, Cham.

Nigam, Amit; Ocasio, William. Event attention, environmental sensemaking, and change in institutional logics: An inductive analysis of the effects of public attention to Clinton's health care reform initiative. Organization Science, v. 21, n. 4, p. 823-841, 2010.

Ocasio,W. 1997. Towards an attention-based view of the firm. Strate- gic Management J. 18(S1) 187–206.

Ocasio, William. Attention to attention. Organization Science, v. 22, n. 5, p. 1286-1296, 2011.

Okhuysen, G., & Bonardi, J. P. (2011). The challenges of building theory by combining lenses. *Academy of Management Review*, *36*(1), 6-11.

Ocasio, W., & Joseph, J. (2005). An attention-based theory of strategy formulation: Linking micro-and macroperspectives in strategy processes. *Advances in Strategic Management*, *22*(18), 39-61.

Oren, Noga et al. How attention modulates encoding of dynamic stimuli. Frontiers in human neuroscience, v. 10, 2016.

Petersen, S. E., & Posner, M. I. (2012). The attention system of the human brain: 20 years after. *Annual review of neuroscience*, *35*, 73-89.

Powell, T. C. (2011). Neurostrategy. *Strategic Management Journal*, *32*(13), 1484-1499.

Ravaja, N., Somervuori, O., & Salminen, M. (2013). Predicting purchase decision: The role of hemispheric asymmetry over the frontal cortex. *Journal of Neuroscience, Psychology, and Economics*, *6*(1), 1.

Rodrígues, C. F. Lingüística Pragmática y Análisis del Discurso. Madrid: Arco Libros, 2000.

Ruiz, Jorge Ruiz. Sociological discourse analysis: Methods and logic. In: Forum Qualitative Sozialforschung/Forum: Qualitative Social Research. 2009

Rule, N. O., Moran, J. M., Freeman, J. B., Whitfield-Gabrieli, S., Gabrieli, J. D., & Ambady, N. (2011). Face value: Amygdala response reflects the validity of first impressions. *NeuroImage*, *54*(1), 734-741.

Saad, G. and Vongas, J.G. (2009). The effect of conspicuous consumption onmen's testosterone levels. Organizational Behavior and Human Decision Processes, 110, pp. 80–92.

Sayer, Andrew. Características chave do Realismo Crítico na prática: um breve resumo. Estudos de Sociologia, v. 2, n. 6, p. 7-32, 2014.

Shepherd, D. A., Mcmullen, J. S., & Ocasio, W. (2017). Is that an opportunity? An attention model of top managers' opportunity beliefs for strategic action. *Strategic Management Journal*, *38*(3), 626-644.

Schultz, M., & Hatch, M. J. (1996). Living with multiple paradigms the case of paradigm interplay in organizational culture studies. *Academy of management review*, *21*(2), 529-557.

Stevens, C., & Bavelier, D. (2012). The role of selective attention on academic foundations: A cognitive neuroscience perspective. *Developmental cognitive neuroscience*, *2*, S30-S48.

Thornton, Patricia H.; Ocasio, William. Institutional logics and the historical contingency of power in organizations: Executive succession in the higher education publishing industry, 1958–1990. American journal of Sociology, v. 105, n. 3, p. 801-843, 1999.

Thornton, Patricia H. Markets from culture: Institutional logics and organizational decisions in higher education publishing. Stanford University Press, 2004.

Thornton, Patricia H.; Ocasio, William; Lounsbury, Michael. The institutional logics perspective. John Wiley & Sons, Inc., 2012.

Thornton, Patricia H.; Jones, Candace; Kury, Kenneth. Institutional logics and institutional change in organizations: Transformation in accounting, architecture, and publishing. In: Transformation in cultural industries. Emerald Group Publishing Limited, 2005. p. 125-170.

Toichi, R.L. Findling, Y. Kubota, J.R. Calabrese, M. Wiznitzer, N.K. McNamara and K. Yamamoto, "Hemodynamic differences in the activation of the pre- frontal cortex: attention vs. higher cognitive process- ing", *Neuropsychologia* 42, 698 (2004)

Waldman, David A. et al. A neurological and ideological perspective of ethical leadership. Academy of Management Journal, v. 60, n. 4, p. 1285-1306, 2017.

Waldman, D. A., Balthazard, P. A., & Peterson, S. J. (2011). Social cognitive neuroscience and leadership. The Leadership Quarterly, 22(6), 1092-1106.

Ward, M. K.; Volk, Stefan; Becker, William J. An overview of organizational neuroscience. In: Organizational Neuroscience. Emerald Group Publishing Limited, 2015. p. 17-50.

Yue, Q., Martin, R. C., Fischer-Baum, S., Ramos-Nuñez, A. I., Ye, F., & Deem, M. W. (2017). Brain modularity mediates the relation between task complexity and performance. *Journal of cognitive neuroscience*, *29*(9), 1532-1546.

## 6. CONCLUSION

The present thesis is composed by four articles that aims to present the Neuroinstitutional perspective: a combination of the institutional logics perspective with Organizational Cognitive Neuroscience towards a broader and holistic understanding of how material and symbolic issues influence organizations and individuals. The major contribution of the perspective here proposed is the possibility of innovation on institutional logics perspective through the possibility of building studies that encompass macro, meso, micro and individual level, including brain activity.

In order to clarify this joining between those perspective, at a first sight, so different in terms of methods and - for a research without a previous knowledge about OCN - even incompatible, the four articles followed a logic the helps scholars to understand and build a research with the Neuroinstitutional perspective.

The first article presented the two perspectives – institutional logics and OCN – and, after discussing its convergences, complementarity and limitations, it is possible to affirm that OCN can bring to institutional theory, specially the institutional logics perspective, a broader understanding of the nature of human sociability in organizational contexts. Institutional logics perspective brought to the surface the importance of individual cognition and agency to organizational adaptation. With the use of OCN it is possible to understand the effects of a constellation of logics on individual and organizational cognition, the role of cognition during social interaction and its effects on organizational decision and action and, even, institutional change.

However, researchers may wonder about the ontological, epistemological, methodological and practical issues when combining so different, and yet, complementary fields. I acknowledge the particularities and challenges of doing such blending of perspectives. This thesis aimed to cover those challenges suggesting a way of how to transpose it.

The second article discussed the importance of a strong ontological base when a researcher decides to combine institutional theory and OCN. The argument was built on the necessity of innovation in organization and management studies and a broader and multilevel understanding of organizations. We proposed the critical realism as an ontological pillar to support the Neuroinstitutional perspective. The metatheory status of critical realism carries explanatory mechanisms common to all sciences, thus providing an ideal way for the link between neuroscience and organizational studies.

After demonstrating the contributions of putting institutional logics perspective and OCN together and showing that it is ontologically possible, I present a way of how to do that. Other articles have already discussed the advantages and possibilities of bringing neuroscience to understand organizational life. However, after being convinced that it is a promising field, the researcher needs to understand the possibilities of research, methods available and how to use it. The third article aims to work as a guide for those researchers who have never been in contact with neuroscience and wish to use it to achieve a broader understanding of managers thinking. We presented a range of methods and techniques available and most used in cognitive neuroscience, its strengths and limitations. Although being useful for organizational research under different perspectives and approaches, I focused on how to apply those methods to deeper explain the institutional logics microfoundations presenting some research suggestions. The article contributes with a variety of research possibilities that can light the path of researchers and broadening the understanding of cognition through a Neuroinstitutional perspective.

Albeit providing ontological, epistemological and methodological explanations to defend the possibility of combining institutional logics and OCN, there was still a challenge that must be faced. How to put those things together and build a research. The fourth article is a suggestion of how to put the Neuroinstitutional perspective in practice. The multiparadigm research was presented as a solution to organize and give coherence to the study and, an example and suggestion of research was presented to illustrate this possibility. I chose one of the institutional logics microfoundations – the focus of attention – to demonstrate how put all those ideas in practice.

This thesis focused on propose a Neuroinstitutional perspective which aims to add a novel understanding of the micro aspects of institutions: the managers thinking deeply understood through the use of cognitive neuroscience. Organizations are complex environments and demands complex analysis. Uncovering the Blackbox of the individual actor is a way to develop a more holistic view about the dynamics of organizational life and the role of institutional logics on organizational adaption from macro to individual level, including the brain.

I acknowledge that putting a Neuroinstitutional perspective in practice involves some challenges and limitations as ethical issues, costs and accessibility. The research design must be carefully traced, covering all ethical requirements. It includes the organization and individuals under study and the university ethical committee that should all be on agreement and aware of all risks and issues related to the research. Besides that, there is a necessity of a multidisciplinary research team, once it is a multidisciplinary research. Management and

organizational scholars are not used to neuroscience methods and concepts, which makes extremally important the participation of neuroscience researchers during data analysis.

I also acknowledge that empirical research is needed to better understand this proposal and to evaluate its application and contribution to management and organizational studies. Unfortunately, the world is facing a pandemic time when collecting data for this type of research is difficult and, sometimes, impossible. That was the reason that the present thesis could not be conducted as planned: empirically, in the real world of an organization.

However, even not being and easy path, I highly encourage researchers to get on board on this incredible journey towards the understanding of human brain under organizational and institutional context. Organizations are fascinating settings permeated by different nuances and influences that deserve to be understood under innovative and broader perspectives. And, the Neuroinstitutional perspective is a promising way to bring new comprehensions about the functioning of organizations and all levels involved.