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Understanding Workplace Behavior through Organizational Culture and Complex Adaptive Systems Theory

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Abstract**—**Purpose: This article aims to rethink the phenomena of employee behavior as a product of a system. Both organizational culture and Complex Adaptive Systems (CAS) theory emphasize that individual behavior depends on the specific system and the unique organizational culture. These two major theories are both represented in the field of organizational studies; however, they are rarely used together for the comprehensive understanding of workplace behavior. Methodology: By reviewing the literature we use key concepts stemming from organizational culture and CAS theory in order to show the similarities between these theories and create an enriched understanding of employee behavior. Findings: a) Workplace behavior is defined here as social cognition issue. b) Organizations are discussed here as complex systems, and cultures which drive and dictate the cognitive processes of agents in the system. c) Culture gives CAS theory a context which lets us see organizations not just as ever-changing and unpredictable, but as such systems that aim to create and maintain stability by recurring behavior. Conclusion: Applying the knowledge from culture and CAS theory sheds light on our present understanding of employee behavior, also emphasizes the importance of novel ways in organizational research and management.

Keywords**—**Complex adaptive systems theory, employee behavior, organizational culture, stability.

I. Introduction: Systemic Approaches to Individual Behavior

DEALING with workplace behavior is an important pursuit of organizational psychology. Over the years of organizational science, many different theories (e.g. behaviorism; humanistic approach; X, Y theories) were developed for understanding and predicting worker behavior. Most of these theories think about people as self-contained actors, autonomous cognitive and psychological beings. Since the complexity theory was introduced to organizational science, this view of workplace behavior was enriched by the system-centered mindset. Prior to CAS theory, organizational culture theory, among other things, was used to understand workplace behavior. In this article, we are combining organizational culture and CAS theory, both of which deal with human systems, in order to identify the systemic aspects of individual behavior. It is our understanding that the psychological and cognitive bases of individual workplace behavior are relying on the complex system and on the organizational culture. Our definition of workplace behavior here is primarily focused on the social cognitive aspects: Processes that occur through coordinated human actions. In order to fully understand workplace behavior, we need to tackle the question of how the individual develops psychological connections to its group. Applying culture and CAS theory helps us to put individualistic actions into context and understand the utter interconnectedness and interdependence of said actions. Through culture and CAS theory we can also see that individual behavior and group processes are mutually creating each other.

A. Thinking in Complex Ways

While the above mentioned classical theories saw independent individuals in a closed system [1], cultural theories introduced the socially constructed field which influences the behavior of each individual who constructed it [2]-[4]. Complexity theories introduced the concept of agents and claim that their behavior changes dynamically along with the systemic changes [5]-[7]. Both with cultural and CAS theory, one needs to adapt to a new mindset of thinking about workplace psychology.

II. From General Systems to Complex Systems

The management theories of the different times ‘mimicked’ the prevailing scientific thought [8]. Complexity theory is a current scientific trend to understand the post-modern organization. The constant changes, new ideas, and forms of doing work shed light on issues which made organizational researchers and theorists think about the nature of the work in ways of complexity. Previous theories viewed organizations as general systems and presumed that the rules that govern a general system are logical and reliable. Agents’ behaviors in this type of systems are predictable, and the rules of causation are fully applicable [1]. With the many current challenges coming from the post-modern organization, a shift has begun from the (closed) general systems theory towards the (open) complex systems theories–these can be described anti-positivist, irrational, and non-linear [1].

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The classical theories of general systems claim that workplace behavior can be governed by top-down commands (e.g. Taylor). These ideas corresponded with behaviorism and cognitive psychology [7 p. 157]. The humanistic theories pioneered by Maslow, McGregor, and Hertzberg claimed that people want to complete their own personal goals of success, self-fulfillment or power, but ultimately they can and will act separately from each other. Contrary to that thinking, complexity theory can be a useful tool for understanding organizational phenomena from a systemic point of view. Human agents always act in a connected way and one agent's behavior will be the cause of another agent's behavior and so on.

The cultural approach had also opened new ways to discuss organizational phenomena that could not be understood from the individualistic perspective. Reference [7, p. 158] states that human action may be better understood if the unit of analysis is not the individual but the group itself. Understanding human action in complexity means that we need to retain the individual focus [7, p. 161].

III. Organizational Culture and Workplace Behavior

Introducing the concept of culture to the field of organizational studies was an important step because it helps researchers to understand the psychological connections between an individual and its group. Traditionally culture was used for understanding the inner forces which can contribute to organizational success. Although culture can be the reason behind an organization's success, there is another way to use this theory: to understand the general psychological rules which drive the workplace and its employees.

A. Ways to Think about Culture

From a conception perspective, there are two ways to acquire the above-mentioned rules. On the one hand, there is the way of generalization. By this method, culture-independent principles can be identified [9] abstract cultural forms which are optimal to make comparisons between different cultures and create a unified knowledge which is useful for researchers and managers alike. On the other hand, there are those cultural theories [2]-[4] which aim to emphasize the utter differences between cultures and come up solutions for describing and understanding these unique forms and phenomenologies. For the point we try to make, this latter approach is more useful because these theories define culture as a commonly shared psychological and behavioral field. Reference [2, p. 1] describe culture as 'pattern of shared basic assumptions. These assumptions drive the behavior of employees and also the workplace itself. Through theory of culture, the interaction between an individual and its group can be successfully described.

B. Social Cognition and Workplace Behavior

Organizational culture is a 'cognitive tool' [9] which can help situate an individual in its context and also to drive its behavior and psychological processes. It is created and maintained by the employees, in order to control the behavior and the psychological features of those same people [10]. According to [11], organizational culture plays a crucial role in an individual sense-making, in personal cognitive processes. Reference [12] claims that the organizationally created meanings and rules are the basis of working individual's cognition. In our understanding, culture functions as a *cognitive compass* which helps situate people in the workplace. Without culture, people would have a hard time adjusting their behavior and psychological states to other peoples.

According to [13, p. 16], social cognition deals with the question of 'how people make sense of other people and themselves, in order to coordinate with their social world.' In many ways, a successful work environment is based on employees who can all make sense of their workplace. Reference [13 p. 20] also states that there are top-down and bottom-up aspects of understanding social cognition. The first way is to study randomly selected individuals and try to come up with ideas about what the general rules of human cognition are. This is based on the view that there are in fact general rules which are applicable to all human beings, and if one studies enough individuals eventually the rules will crystallize. The second way states that human cognition is 'culturally bounded', individual cognitive processes cannot be understood by thinking of people as independent thinkers. Every individual is a part of a culture (family, nation, relationships, workplace etc.), and there is not a single individual in 'vacuum' [14, p. 32]. One can only understand an individual's behavior if one knows the culture that person belongs to [15, p. 1]. 'Cultural social cognition reflects the importance of humans as adaptive social beings, evolved to focus on other people, to imitate behavior, discern intent, cooperate together, and learn symbol systems' [16]. Situating individuals in a culture or agents in a complex system has a definite cognitive aspect. Driving the cognitive processes of the employees is one of the most important aspects of the workplace. According to [17], 'organizations exist as systems of meanings that are shared to various degrees. A sense of common, taken for granted ideas, beliefs and meanings are necessary for continuing the organized activity. This makes interaction possible without constant confusion'. According to [18], the organization tries to channel human interaction by giving it a common form.

C. Complexity and Social Cognition

Reference [7, p. 163] states that there is a clear connection between complexity and social cognition. 'For most scientists working in the complexity sciences, the individual agents are schemas or algorithms representing the world they act into. The agents manipulate and process information according to their schemas as the basis of their interaction. Algorithms drive the behavior of the agents, although no algorithm can be identified for behavior at the global level.' Reference [7, p. 171] reviewed the classical theories of social studies and showed that the question of human-group interaction is one of the most important research fields of social sciences, and also showed that this interaction can be successfully understood by the ways of complexity. For [5] human beings are distinguished from other animals by their sophisticated processes of cooperating

with each other and their use of tools to make a living. In other words, the distinctive feature of human animals is their social behavior and it is distinctive in that human social processes are conducted in the medium of symbols.' There is a long line of connection between social studies, cognition, organizational theories and complexity science. The way human beings behave in a system is dictated by the cognitive and psychological rules of the system.

IV. Complex Aspects of Organizational Culture

In this section, we are going to show four major similarities between CAS theory and organizational culture. These are (a) the importance of interaction, (b) emergent qualities, (c) the aspects of irrationality, and (d) observer dependency. Thinking about organizational culture through CAS theory helps us to understand how culture is created, however, we would like to suggest that considering the CAS through a cultural aspect is also broadens our view. Culture gives context to the CAS theory.

Interaction: Reference [2, p. 63] understands culture as a product of the constant interaction between people. 'Culture is both a dynamic phenomenon that surrounds us at all times, being constantly enacted and created by our interactions with others.' Culture is created by the group itself, and at the same time, it dictates the behavior of the same people who create it. The co-creation of the culture is one of the important aspects where culture can be connected to CAS theory. Reference [4, p. 3] states that culture is understood to be a system of common symbols and meanings. It provides 'the shared rules governing cognitive and affective aspects of membership in an organization, and the means whereby they are shaped and expressed'. Reference [19, p. 3] emphasizes the symbolic aspect of culture. The basis of interaction is that culture exists 'between people's heads', it is nowhere to be found, however, it is real for the members of the organization. Without interaction, human systems cannot be created, and without systems, human beings would not be able to drive their own behavior. Structuration theory by [20] state that structure and agents are constantly creating each other: 'agency creates and recreates structure and at the same time structure constraints and enables agency'. That means that the day-to-day behavior and psychological states experienced in the workplace are the results of the agent-structure interaction. Culture and people are constantly creating and re-creating each other [21].

Emergence: The aspect of emergence is an important feature of a CAS. The concept of emergence states that while agents in a system are in interaction, they create some phenomenon which cannot be understood from the attributes of the agents that created it. The whole is greater than the sum of its parts. We think about culture as an emergent quality of employee interaction, something that cannot be touched and measured directly, however it seems very real to the people who created it. Reference [2 p. 85] divides the culture into physical and non-physical parts: *artifacts* and *underlying assumptions*. One can look at the artifacts of culture, which can be the way people behave, communicate, dress or decorate their offices, etc., but the underlying assumptions are cannot be seen. Although they have an impact on the employee behavior, culture's unconscious aspect seems to drive the psychologically important characteristics of the workplace.

Reference [2, p. 86] describes six different types of underlying assumptions. These are (a) assumptions about the nature of truth and reality, (b) the nature of time, (c) the nature of space, (d) the nature of human nature, (e) the nature of human activity, and (f) the nature of human relationships. From a CAS theory perspective, we can understand underlying assumptions of culture as emergent qualities. These rules are mostly 'unconscious' [2] but also real drivers of employee behavior.
Emergence is also key to understand the change in human organizations – how to manage organizations if emergence is an important phenomenon [6]. Reference [6] states that culture is emergence 'people mutually coerce one another into conformity' – in this view culture is not imposed from outside but exposed from within. The central issue is not cultural change the amazing thing that needs to be investigated is cultural stability. Reference [6] define culture as 'the emergent result of the continuing negotiations about values, meanings, and proprieties between the members of that organization and with its environment. According to [22] the process by which patterns or global-level structures arise from interactive local-level processes, this 'structure' or 'pattern' cannot be understood or predicted from the behavior or properties of the component units alone. Most changes in complex systems are emergent; that is to say, it comes about as a result of the interaction between the 'agents' in the system. Complexity theory suggests that when there is enough connectivity between agents, emergence is likely occurring spontaneously [23].

Irrationality: Non-rationality and non-rational behavior is a recurring topic in organizational science. Reference [6] Cites Simon's concept of bounded rationality to show the parallelism between human and organizational decision making. Individuals are limited to their information-processing capabilities, so too are organizations: organizations act on incomplete information, explore a limited number of alternatives, and do not necessarily develop accurate cause and effect maps of reality [6]. From a CAS theory perspective, we can grasp non-rational behavior and cognition. Actors in a complex system possess only a fraction of information about the system itself. If one from an observer point of view happened to be looking at the system in its entirety, could see agents who are acting on very different amounts and qualities of information. This can render a system complex and chaotic from an outsider's view and rational from the agent's point of view.

Bounded rationality was brought up recently again by [24] as the phenomenon of 'organizational stupidity'. This concept highlights, that outdated idea and ways of cognition are playing important role in the life of an organization. Some non-adaptive ways to act and think tend to be very stable over time because agents keep them in the system. However 'stupid' they seem from an outsider perspective, these ossified parts of culture have psychologically important features. Reference [21] States that one of the most important features of organizational culture is repetition, it gives recurring solutions to recurring problems. This way culture creates a psychologically safe and reliable

environment. It has the power to discipline attention, create a so-called 'territory' where people can safely interact with each other and know the ins and outs of the workplace.

Observer dependency: this aspect can be quite worrying from a researcher's point of view. Based on this aspect of observing and describing the human system is not an objective process. Two different observers can come up with two different interpretation of the same system. Their interpretation is influenced by the method they apply, their pre-constructed ideas about the system. Not to mention the system itself, also reacts to the fact of observation. Reference [25] Emphasize that complexity is not only a feature of a system, it is also a matter of how we organize our thinking about those systems. They call it second-order complexity: we need to think about how we think about complex systems and their specific features like non-linearity, indeterminacy, unpredictability, and emergence. Complexity and observer dependent interpretation are very closely related to each other. Reference [26] Claims that complexity is not an intrinsic property of a system; it is observer-dependent, that means, it depends upon how the system is described and interpreted.

Complexity science has done is to draw our attention to certain features of system's behaviors which were hitherto unremarked, such as non-linearity, scale-dependence, sensitivity to initial conditions, and emergence. 'The system cannot speak for itself' Rorty, cited by [25]. Culture itself possesses the same aspect. One can only get to understand the culture through its members and different members can paint vastly different pictures about the culture.

V. Complexity Theory in the Field of Organizational Studies

CAS theory is already in the field of organizational studies and it seems to be a useful theory to grasp specific aspects of the post-modern organization. A theory of CAS was borne by the discovery of chaotic dynamics in systems' behaviors. Main characteristics of systems described by chaos theory [8]. The behavior of the system's agents is seemingly random and chaotic, also nonlinear. Organizational theories based on complexity are aiming to understand workplaces as systems which situated in the turbulent environment. And at the same time, constant inner changes and movement complicate matters further.

Thietart and Forgues cited by [8] emphasize that the behavior of this system cannot be precisely predicted because of the many parts of the system. That means, for research and management purposes unpredictability needs to be taken into account.

Complex systems can show intriguing aspects based on their unique ways the built up. [27] Introduced the uniqueness paradox: every culture is unique, however, the cultural building blocks are the same for every organization. The complexity paradigm uses systemic inquiry to build fuzzy, multivalent, multilevel and multidisciplinary representations of reality. Descriptions are indeterminate complimentary, and observer-dependent [6]. Change occurs through negotiations at multiple sites among those, who generate data, interpret them, theorize about them, and extrapolate beyond them to broader cultural and philosophical significance.

Thinking about a CAS and try to research or manage it are in fact the two sides of the same coin. Because everything is observer-dependent these two aspects are inseparably intertwined. According to [23] for this task, we need to know the features of complex systems: a large number of interacting elements, interacting in nonlinear ways, these are systems also dynamic and possess emergent qualities. Reference [23] Also emphasizes that the specific history of these systems is an important factor because the systems remember its past behavior and drive its future ways of working. Reference [23] remind us that based on this specific way of functioning an observer can only understand these systems with hindsight – trying to come up with explanations why something happened in the system.

A significant amount of organizational research is aimed to understand CAS theory from a change management point of view [6], [7], [22], [23]. If the individual behavior is under the influence of the complex system processes than the conclusion seems logical: if one would change the system, the individual behavior of the employees will change accordingly. Additional to that idea, we would like to point out that we can also think about the role of stability and recurrence in the workplace. Through the recurrent stabilization of culture described by [21], we can postulate that human agents in a workplace system strive to have a stable psychological and behavioral field.

VI. Agents of CAS and Workplace Behavior

The basic building blocks of a CAS are agents. In an organizational system, agents are called working individuals [8]. From an organizational psychologist's perspective, one of the most important questions is how can one understand and predict individual behavior. However, the question concerns the individual, the answer, we think, could be found in the CAS. Earlier we emphasized the connection between the individual and its culture. If we understand culture as a social cognitive tool for situating the individual at its own group we also need to emphasize that the individual's behavior is unintelligible on its own without its culture [15]. In an organizational system building blocks occur in the form of general attitudes toward other functional areas (e.g., labor vs. management), values, symbols, myths, business assumptions, etc. These schemas are rationally bounded: they are potentially indeterminate because of incomplete and/or biased information; they are observer dependent because it is often difficult to separate a phenomenon from its context, and they can be contradictory [8].

Acting in a CAS can be a cognitively taxing process for the agents. Individuals need to understand the rules of interaction, they have to learn and adapt to them. These rules help the individual to control its behavior and also to predict the behavior and potential psychological responses of other individuals. Fine tuning our own behavior to a group is an overwhelming task to take on. When someone considers initiating changes in the workplace, one needs to be mindful of the possible cognitive tasks that the agents need to take. Based on this, influencing agent behavior can only be possible by

managing the system itself. General guidelines for designing successful systems are concern about creating a common cognitive ground through shared purpose and values. Enable divergent thinking, but also creating boundaries [8].

VII. Methodological Consequences

Complexity theory gives us a renewed look at organizational phenomena like culture and employee behavior. Contrary to general systems theory human systems can be problematic when one tries to understand or manage them. Nevertheless, we need to search for the roots of organizational behavior with the help of complexity theory. The methodological approach, as well as our research mindset, needs to be changed in order to be more accurate in understanding workplace psychology and behavior. Organizational culture, individual behavior, and workplace psychology is a product of a CAS. Every organizational culture (or human group for that matter) is a unique set of assumptions, that means we won't find two cultures or systems that function in exactly the same way.

We need culture to contextualize complexity. Complex systems from an abstract (cultureless) point of view can be seen as fickle and ever-changing, also random and something that cannot be managed or understood easily. If we add culture to complexity, we can instantly see that change and transformation in an organizational system are bounded by the rule of stability. Human agents in a system tend to stabilize the current workings of that system. In order to have psychological safety and want other people's behavior to be predictable, human agents need to have a stable set of interactions. One of the most important features of culture is to maintain stability and this knowledge can be added to the CAS theory.

The question remains how we can analyze or manage a complex system. In this article, we tried to show how the CAS theory can help us to better understand organizational culture and complexity. However, the cold fact remains that complex systems are observer dependent, two researchers or manager can look at the same system and consider it both simple and complex or manageable and unmanageable. Reference [28 p. 4] describes this specific problem with the analogy of the play called Tamara. Tamara is a postmodern play in which there is no one designated stage which the audience can look upon, rather many rooms where pieces of the story happen parallel to each other. It is up to the audience member which room to go into, how long to stay and which room to go in next. Events are not put on hold for the audience to look and hear everything, rather they can just catch bits and pieces, and based on the sequence one went through the play. Two people can have two very different ideas about what went down. This is a very accurate and even more troubling analogy because this is exactly what happens when a researcher (or a manager for that matter) experiences the day-to-day happenings of an organization. One can only see just a fraction of the activities at the workplace, other events are not being put on hold, they just happen no matter what. Based on the limited experience a researcher or a manager can acquire, it would be an oversimplification to draw a generalized conclusion about the culture or the overall working of the organization.

This analogy is also true for employees in an organization. As an organizational member one can only have a fractional view of the workplace. This is what constitutes as being an agent in a complex system. An organizational culture or system is built on members who just possess a fragment of the entire system this is one of the most important sources of complexity. The workplace behavior, if we look at it from a complexity point of view, entails the cognitive and psychological strive to fine tune one's behavior to the specific part of the system. Everyone tries to behave similarly to others, based on what they experience. This drive is added to the already existing ones (identity, self-growth, prestige, learning etc.), can give us a more substantial idea what is going on in the workplace. Coping with the fragmented pieces of the system urges stability and similarity.

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