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Entropy and Institutional Theory

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Entropy and institutional theory

Purpose: Once introduced and conceptualized as a factor that causes erosion and decay of social institutions and subsequent deinstitutionalization, the notion of entropy is at odds with predictions of institutional isomorphism and seems to directly contradict the tendency towards ever-increasing institutionalization. The aim of this paper is to offer a resolution of this theoretical inconsistency by revisiting the meaning of entropy and reconceptualizing institutionalization from an information-theoretic point of view.

Design/methods: It is a theoretical paper that offers an information perspective on institutionalization.

Findings: A mistaken understanding of the nature and role of entropy in institutional theory is caused by conceptualizing it as a force that counteracts institutional tendencies and acts in opposite direction. Once institutionalization and homogeneity are seen as a product of natural tendencies in the organizational field, the role of entropy becomes clear. Entropy manifests itself at the level of information-processing and corresponds with increasing uncertainty and the decrease of the value of information. Institutionalization thus can be seen as a special case of an increase in entropy and a decrease of knowledge. Institutionalization is a state of maximum entropy.

Originality/value: It is explained why institutionalization and institutional persistence are what to be expected in the long run and why information entropy contributes to this tendency. Contrary to the tenets of the institutional work perspective, no intentional efforts of individuals and collective actors are needed to maintain institutions. In this respect, the paper contributes to the view of institutional theory as a theory of self-organization.

Keywords: institutional theory, organization science, entropy, information, institutionalization.

"*This is just...entropy, he said, thinking that this explained everything, and he repeated the strange word a few times*" (Karel Capek, "Krakatit").

Introduction. A theory of deinstitutionalization is an important milestone for institutional theory as it asks whether and how even highly institutionalized practices, norms and beliefs tend to weaken, erode, decay and disappear over time (Oliver, 1992; Røvik, 1996; Clark and Jennings, 1997; Dacin et al., 2008; Maguire and Hardy, 2009; Kondra and Hurst, 2009; Gilmore and Sillince, 2014; Becker, 2014; Clemente and Roulet, 2015; Patora-Wysocka, 2015; Christiansen and Kroezen, 2016; Chaudhry and Rubery, 2019; Aksom, 2022a). Before Oliver's (1992) theory there were no theoretical extensions of new institutionalism with regard to the fate of institutions. Institutional theory focused mainly on the diffusion, legitimation and institutionalization of already popular practices and did not specify what happens with institutionalized practices and norms over time. The theory assumed instead that persistence tends to proliferate. But while one of the most important themes in institutional analysis had emerged out of the 1992 paper, the causes, mechanisms and consequences of the so-called deinstitutionalization offered by Oliver seemed to be theoretically problematic. The theory of

deinstitutionalization immediately faced insurmountable theoretical problems and paradoxes and challenged the internal self-consistency of institutional tenets (Aksom, 2022a). In fact, it is safer to accept it as a theory of individual organizational change rather than a theory of institutional change at the macro-level (Alvesson and Spicer, 2019). Besides the obvious paradox that arises once we assume that actors can doubt and deinstitutionalize taken-for-granted, reality-like social facts that are "*beyond the discretion of any individual participant or organization*" (Meyer and Rowan, 1977:344), an introduction of a mysterious notion of entropy is no less problematic for this theory. The notion of increasing entropy of institutions is at odds with the predictions of institutional isomorphism and the ever-increasing extent of institutionalization (DiMaggio and Powell, 1983; Meyer et al., 1997). In a sense, this paradox is similar to the alleged conflict between Darwinian evolution and the Second Law where evolution is a decrease of entropy, because it involves things getting more organized over time, while the second law says that things get more disordered over time. The resolution of this paradox for biology (see Prigogine and Nicolis, 1971, Smith, 1975 and Volkenstein, 2009), however, is far simpler that it is for institutional theory. Nevertheless, once described by Zucker (1988) and Oliver (1992) as a factor that causes erosion of social institutions and subsequent deinstitutionalization, the notion of entropy, since then, has disappeared from the vocabulary of institutional theory (despite this fact, the 1992 paper remains to be among the most influential papers in institutional theory). And although this concept was introduced quite arbitrarily back then, entropy nonetheless does exist in social systems; it can and should be taken seriously in institutional analysis and the very existence and manifestation of entropy lead to important implications for organizational research. In fact, the very notion of entropy leads us to one of the most interesting paradoxes in institutional theory. We address this paradox in the present paper and the notion of entropy occupies a central role in this discussion.

The question that arises out of the clash between Oliver's and DiMaggio and Powell's theories is as follows: does institutional theory permit entropy and deinstitutionalization? Or put differently: does entropic tendency permit institutionalization? And what did Zucker (1988) and Oliver (1992) mean by entropy? What did they miss in their interpretation of entropy and entropic tendencies? And why their suggestion is so important that needs to be reintroduced back into institutional analysis? In this paper we revisit the notion of entropy, review its meaning and properties in other (neighboring) sciences and suggest how it should be understood and used in institutional theory. In particular, it is argued that it is not an institution that is subject to entropic tendencies but the value of information and information-processing. Seen from this perspective, the manifestation of entropy makes sense and appears consistent with the basic tenets of institutional theory. Once entropy is recognized as an information-reducing tendency, it is possible to reformulate the notion and properties of entropy in terms of institutional theory and theorize the implications. And, *vice versa*, it will be shown, that institutional theory can be fruitfully reformulated into the language of information theory which increases our understanding of certain fundamental institutional issues related to uncertainty, mimesis and isomorphism.

This is the third and final paper of a series describing an attempt to resolve interesting theoretical and logical paradoxes in institutional theory by reconsidering the nature of institutions, institutional change and institutional explanations (Aksom, 2021; 2022a). We attempt to obtain a deeper understanding of what institution is and is not, what institutional change is and is not and

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where the boundaries of institutional theory are. One of the aims of this paper is to prove than institutions are more persistent and durable that various institutional theories tend to argue. Institutions are much more sustainable than, for example, literature on deinstitutionalization and institutional work would assume. Institutional theory is all about the phenomenon of institutionalization and institutional persistence. As "*man is an institution-making animal*" (Chapin, 1928:375), institutional theory should explain the tendency toward the longevity of institutions. An informational interpretation of institutionalization allows understanding of the fundamental nature of institutions as structures that arise, persist and survive due to the absence of useful information in the field. After all, institutional theory is and should remain a theory of self-organization and equilibrium (Bailey, 1984; Wallis and Valentinov, 2017). It is not a theory of the fragility of institutions, their tendency to break down and change but a theory of a system that persists and tends towards stabilization, self-maintenance and a return to a particular state if disturbed. Just like the market mechanism is capable of coordinating the independent decision and leading to the phenomenon of the "invisible hand", so do institutional forces as "*organizational actors making rational decisions construct around themselves an environment that constrains their ability to change further in later years*" (DiMaggio and Powell, 1983:148).

The paper is structured as follows. First, we review existing understandings and perspectives on entropy in organizational research and in institutional theory. Then it is analyzed what entropy means and how it works in some neighboring sciences, including systems science, economics and sociology. Then follows a section where entropy is reintroduced into institutional theory and its meaning is clarified and theorized given its true meaning. We then show how the notion of entropy can be reconciled with the institutional theory of isomorphism, stability, inertia and persistence. The paper concludes with discussions and implications for organizational and institutional research.

2. Entropy, deinstitutionalization and institutional maintenance assumptions in institutional theory.

2.1. Early mentions of entropy in institutional theory and organizational sociology.

In the 1980s institutional theory was concerned mainly with the diffusion, legitimation and institutionalization of popular organizational practices, structures and codes of behavior. Institutional theory explained why and how organizations change to become isomorphic with their environment and "*has focused on the movement towards, and maintenance of, isomorphic institutional environments*" (Kondra and Hinings, 1998:743). The phenomenon of institutionalization, persistence and longevity of seemingly sub-optimal or even obsolete and useless organizational routines was a puzzle and empirical anomaly that early institutionalists attempted to solve (Staw and Epstein, 2000; Aksom, 2018). Institutionalized elements are those that "*tend to be enduring, socially accepted, resistant to change, and not directly reliant on rewards or monitoring for their persistence*" (Oliver, 1997, p. 699). Likewise, institutions are shared, taken-for-granted meanings and understandings associated with certain practices that actors accept and perceive as a social fact and objective reality (Martin, 1968; Zucker, 1983; Scott, 1987; Zilber, 2002). Key questions that institutional theory asked were "*why many organizational forms and procedures can exist without obvious technical or economic value*"

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(Staw and Epstein, 2000:524) and why "*much of what happened inside organizations had little to do with the objective tasks in which organizations were engaged*" (Palmer et al., 2008:739). Of course, it was only a matter of time before institutionalists began blaming the theory for "ignoring" diversity, change and interest-driven behavior (Aksom and Tymchenko, 2020; Firsova et al., 2022).

Since the 1990s there were plenty of artificial and far-fetched and few really convincing explanations of institutional heterogeneity and change. Among these explanations, the notion of entropy is among the most curious, imaginative and provocative conjectures. Entropy as a theoretical construct had been introduced into organizational studies and institutional theory by Zucker (1988) as she assumed that social systems are subject to erosion and decay, that is, they are subject to the Second Law of Thermodynamics (which is nowadays a mainstream view in systems science and cybernetics). According to Zucker, the very institutional forces that produce social order cause its gradual decay, therefore, a self-consistent explanation is proposed for the rise and fall of social orders[1]. For Zucker, entropy occurs whenever there is an imperfect transmission and modification of rules (Scott, 2013:167).

In the case of Zucker's explanation, it is however unclear how institutionalization occurs and proliferates despite entropic forces and why entropy begins manifesting itself only after a considerable time lag. And why does institutionalization occur at all if it is not a natural state of organizational fields? And most importantly, why does this erosion "*needs to be continually countered by active intervention to maintain the institution*" (Zucker, 1988:26) if institutions tend to persist and are reproduced as obvious, objective and taken-for-granted structures? Institutional theory predicts that institutional forces become stronger over time (DiMaggio and Powell, 1983), homogenization is what to be expected (Meyer et al., 1997; Meyer and Bromley, 2013) and institutional order persists and in this sense, the introduction of the concept of entropy looks somewhat artificial and unjustified. It is also vague in Zucker's writings what is a subject of entropy – institutionalized organizations, institutionalized practices or institutionalized organizational environments? In the deinstitutionalization literature, the same problem is present: when referring to entropy, Oliver sometimes attributes it to organizations and in other cases to institutions. She mentions that "*organizations possess both inertial qualities and tendencies towards entropy*" (Oliver, 1992:579) and later she refers to "*institutional rules*". Arguably, a theory of deinstitutionalization should be about the erosion and weakening of institutional meanings associated with certain practices, not simply about how certain organization abandons certain practice. Otherwise, it is a theory of organizational change.

2.2. Entropy and deinstitutionalization

Nevertheless, despite the lack of theoretical elaboration, entropy is acknowledged by some organizational theorists. For example, Dover and Lawrence explicitly consider entropy to be the universal concept that has important consequences for organizations and institutions:

[1] A similar approach is taken in Abrahamson's (1996) management fashion theory where the supply and demand for new management receipts cause their sustained turnover which includes wide dissemination, disappearance and substitution with new fashions.

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"*…Largely missing [in organization theory] is the common tendency of both technology and institutions toward entropy. Technological entropy is a well established pattern, associated with the gradual breakdown in performance and reliability of technical systems. Whether through use, overuse, or underuse, all physical systems tend toward decay and breakdown over time. A similar character has been noted with respect to social institutions (Zucker, 1988) – mechanisms of social control will tend over time to decay in their efficacy unless intervention occurs that restores those controls or implements new mechanisms. Often portrayed as powerful, enduring forces, institutions may be more fragile and their persistence less inevitable than is typically acknowledged (Oliver, 1992). We argue that this shared tendency toward entropy may be exacerbated in social systems that depend on complex layers of technology and institutions because the entropic tendencies of each may interact in ways that multiply the potential for breakdown. Decaying institutions can similarly weaken associated technologies*." (2010:260).

The notion of entropy survived in Oliver's theory of deinstitutionalization. The latter is defined as "*the delegitimation of an established organizational practice or procedure as a result of organizational challenges to or the failure of organizations to reproduce previously legitimated or taken-for-granted organizational actions*" (1992:564). Oliver's task was to propose mechanisms that cause erosion and subsequent abandonment of established institutionalized practices and norms[2] and these causes had been attributed to political, functional and social pressures[3]. While institutional theory claims that organizational practices tend to become infused with institutional value and meaning and thus persist in organizations even without obvious technical value due to a taken-for-granted status, a theory of deinstitutionalization asked how even institutionalized practices tend to weaken and disappear in the long run (Oliver, 1992; Røvik, 1996; Scott, 2001; Dacin et al., 2008).

Besides functional, political and social factors of deinstitutionalization, institutionalized practices are also claimed to be subject to natural erosion and decay. While institutional inertial forces work against attempts to break down stability and homogeneity, "*organizations possess both inertial qualities and tendencies towards entropy and these are expected to exert opposing forces on the organization in moderating the pace or velocity of deinstitutionalization*" (Oliver, 1992:579-580). Thus, the notion of irreversibility is common for both classical formulation of institutional theory (DiMaggio and Powell, 1983) and for Oliver's extension (and irreversibility is a cornerstone of the Second Law of Thermodynamics which postulates the existence of entropy). But these theories claim different consequences and thus seem to directly contradict each other[4]. DiMaggio and Powell claimed that institutional forces become stronger over time,

[2] In Røvik's (1996) theory the basic driving force behind deinstitutionalization is experiential learning.

[3] It is important to distinguish between the deinstitutionalization of a taken-for-granted practice and the abandonment of such practice in a single organization. In many cases, scholars tend to confuse organizational change with institutional change and deinstitutionalization with practice abandonment. If a single organization have abandoned even highly institutionalized practice it is not yet an indicator of institutionalization; here it is a case of organizational change and in many studies on deinstitutionalization these two phenomena are often confused. The difference is between the disappearance of an institution and the failure of a single organization to maintain an institutionalized practice. In many respects not only do a lot of studies on deinstitutionalization in fact explore such single instances but Oliver's theory can be seen rather as a theory of organizations that deviate from taken-for-granted norms and practices but it is not about the decay of institutions.

[4] Contrary to Oliver (1992), DiMaggio and Powell claimed that institutional forces do not weaken and become even stronger over time: "*organizations may try to change constantly; but, after a certain point in the structuration of an*

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while Oliver assumed that entropy might work against these tendencies (see Figure 1). In the 1992 paper, deinstitutionalization becomes possible when entropy pressures outweigh institutional inertial forces (Dacin et al., 2008).

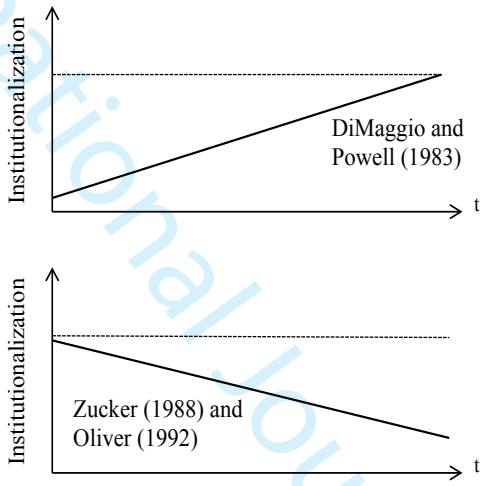

Figure 1. Institutional dynamics in the long run according to institutional isomorphism and deinstitutionalization theories respectively. The former predicts a tendency toward increasing institutionalization and persistence while the later claims the tendency towards erosion and decay of institutional forces.

Dover and Lawrence (2010) argued that entropy is a cause of the decay of institutional order and purposeful efforts are needed to restore the institutional status quo. It is thus maintenance and persistence that should be explained while entropy makes the uncontested, taken-for-granted reproduction of institutional scripts problematic. It seems that institutional work is needed to prevent these mysterious entropic tendencies. Otherwise, institutions are doomed to break down, decay and disappear. Institutional maintenance is thus "*not a stable property of the institutional order and various forms of work may be necessary to ensure institutional continuity and stability*" (Micelotta and Washington, 2013:1138). Entropy was introduced into institutional theory as one of the factors that prevent the longevity, stability and persistence of institutional values and meanings (Oliver, 1992; Aksom, 2022b). The main conclusion is that entropy and institutional isomorphic pressures act on organizations and organizational fields from opposite directions. Entropy seems to be the opposite of institutional forces.

Despite the fact that entropy had been introduced arbitrarily into institutional explanations, it has been assumed since then that a tendency towards erosion and deinstitutionalization is not only real and present in institutional dynamics but this tendency is prevalent. Scott later agreed with Zucker and Oliver that "*things – structures, rules and routines – tend to break down*" and "*persistence is seen to be tenuous and problematic*" (Scott, 2013:151). In their review essay on institutional theory Delbridge and Edwards argue that "*social entropy threatens institutional stability and that building and maintaining institutions is a continual process*" (2007:201). One might get the impression that the existence of entropy in institutional structures suddenly became almost self-evident and obvious textbook knowledge.

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organizational field, the aggregate effect of individual change is to lessen the extent of diversity within the field" (1983:148-149).

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Nevertheless, it is the most striking observation that the notion of entropy has disappeared in subsequent theoretical ideas on institutionalization and institutional change. It is even more puzzling given that entropy and inertia constitute the core of Oliver's theory. Organizational entropy is "a *critical determinant of deinstitutionalization*" (Oliver, 1992:579). This phenomenon of forgetting is similar to the paradox described by Mizruchi and Fein (1999) who noticed that mechanisms of institutionalization in DiMaggio and Powell (1983) have not received equal treatment as most studies have focused on mimetic isomorphism. After all, entropy was a temporal, passing idea as there emerged a lot of other ad-hoc explanations of institutional change, ranging from institutional contradiction to the emergence of change at the boundaries of organizational fields.

2.3. Entropy in the institutional maintenance work perspective

Later on, the idea of decaying institutions reemerged in the institutional work theory where the understanding of institutional maintenance and reproduction as unproblematic and taken-for-granted has been challenged once again (Lawrence and Suddaby, 2006; Lawrence et al., 2011; Hwang and Colyvas, 2011). Instead, it was argued that not all institutions are self-reproducing, and for many institutions to remain stable and persist the work needs to be carried out by field actors. Theoretical predictions with regard to stability vs. change and persistence vs. erosion became even more blurred and distorted in the IW theory (Lawrence & Suddaby, 2006). One more time in the history of institutional theory development, the role of agency was over-emphasized (Modell, 2015; 2022). In this contemporary institutional analysis Oliver's assumption that most institutions are vulnerable to atrophy is accepted, preserved, and further developed and the very institutional persistence seems to be a puzzling empirical phenomenon that requires a more satisfactory theoretical explanation (Dacin et al., 2010; Micelotta and Washington, 2013; Lok and De Rond, 2013; Siebert et al., 2017; Colombero and Boxenbaum, 2019; Gidley, 2021; Raynard et al., 2021; Boutinot and Delacour, 2022; Voronov et al., 2022). A widely accepted view is that institutions cannot persist without field-level actors who consciously and purposefully maintain them and that institutional maintenance assumes "*supporting, repairing, and recreating*" of institutions (Lawrence & Suddaby, 2006:230; Dacin et al., 2010). Unconscious reproduction is replaced in this theory with the understanding of institutional maintenance as a strategic process.

The preservation of the institutional status quo requires incumbents "*to perform maintenance work in order to neutralize potential threats and ensure the perpetuity of governing rules, norms of social interactions and cognitive interpretive frames*" (Micelotta and Washington, 2013:1140). Otherwise, institutions will erode, decay and disappear (Dacin et al., 2010; Siebert et al., 2017). Needless to remind, this perspective on institutions also directly contradicts the former view on institutionalization as a force that increases and persists over time (DiMaggio and Powell, 1983; Scott, 1987; Hayes, 1926). It also seems that the institutional work perspective simply ignores Berger and Luckmann, Hughes and other fundamental writings on the nature of institutions and their taken-for-grantedness and endurance. But even institutional maintenance work studies make only passing reference to the notion of entropy. The latter was sometimes ritualistically mentioned in order to justify why institutional erosion is inevitable but the authors engaged in no discussion of the nature and properties of entropy as such. Dacin et al. (2010)

referred to Zucker's claim "*that although social systems may appear remarkably stable, they are at the same time fraught with entropy*" (2010:1395). Lok and De Rond argue that institutional work is "*required to overcome the entropic tendencies that characterize most institutions*" (2013:185). Siebert et al. (2017:1609) claim that "*without continuous action to maintain existing institutional orders, institutions would decay due to sheer entropy… Thus, institutional maintenance is crucial*". Montgomery and Dacin argue that institutional persistence and survival might be "*better understood as the exception rather than the rule, and institutional arrangements may be the victims of "entropic forces*" (2020:1456). That entropy exists and works against institutionalization and institutional persistence is already taken-for-granted at this stage of institutional work studies. A reference to "social entropy" as a factor that somehow works against institutionalization can be found even in one of the classical neo-institutional texts – Jepperson's (1991) *Institutions, Institutional effects and Institutionalism*. But what is entropy, why it occurs and how it works are not specified in any of these works. It seems like the main reason to mobilize the notion of entropy for institutional work researchers was an attempt to justify the need to pursue this new, fashionable research stream[5]. And the former attempt to question the taken-for-grantedness of the notion of institutionalization evolved into a taken-for-granted assumption about the fragility and erosion of institutions (Montgomery and Dacin, 2020).

While the notion of entropy has disappeared from institutional theory, the idea of institutional erosion and atrophy remained and became almost taken-for-granted without questioning why key institutional ideas are so distorted and ignored. In particular, the notion of conscious, effortful and purposeful institutional maintenance work ignores the widely established assumption in institutional theory that institutions are taken-for-granted part of social reality, independent of the actor's own views or actions (Scott, 1987:496), "*beyond the discretion of any individual participant or organization*" (Meyer and Rowan, 1977:344) and that institutionalization increases and persists over time (DiMaggio and Powell, 1983). The very notion of institutional work is at best arbitrary and at worst, contradicts all established ideas in institutional theory. Whether institutions are really vulnerable to atrophy and institutional work exploits these tendencies towards disorder can be answered only after the nature of entropy is understood in the context of institutional theory.

3. What is entropy?

It is not surprising that theorists in many disciplines find it difficult to understand and adapt the notion of entropy to their sciences (Ryan, 1980; Corning and Kline, 1998; Kåberger and Månsson, 2001; Gillett, 2006; Volkenstein, 2009; Swendsen, 2011; 2012; Koutsoyiannis and Sargentis, 2021). The notion of entropy emerged out from the need to express and indicate the irreversible processes. The entropy should increase when a system evolves into the future. Entropy is an extremely abstract concept and the Second Law of Thermodynamics has a specter of different formulations and understandings. This ambiguity has its reason because it is a widely established idea in the scientific literature across a wide range of sciences and disciplines that

[5] In contrast to the institutional theory, for example, researchers in ecological economics took the issue seriously and the Ecological Economics journal is full of papers where the nature and manifestation of entropy are discussed in all detail.

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thermodynamic entropy as a consequence of the Second Law of thermodynamics finds its manifestation in many systems and phenomena including social organizations at least at two fundamental levels: as information un(certainty) and dis(organization) and dis(order). Entropy is a characteristic of the state of matter and a measure of a certain distribution of probabilities (Rowlinson, 1970; Elitzur, 1994; Bratianu and Bejinaru, 2020). It is a state function, comparable to temperature or energy. Given the probabilistic nature of thermodynamic entropy (Pascal and Pross, 2015), it is not exclusively a concept of statistical physics anymore; it has been recognized as being a fundamental property of information uncertainty and information perspective allows generalizing entropy and "*freeing from the special disciplinary framework of thermodynamics*" (Wicken, 1986:276):

"*…entropy ceased to represent merely a measure of the depreciation of energy, and assumed its true role as a measure of the degree of disorder of a system, an objective characterization of the unavailability in principle of information about a system*" (Volkenstein, 1986:139).

Entropy means equilibrium, that is, a state of a higher probability that a system inevitably reaches over time (Swendsen, 2012; Bratianu, 2019). Entropy also means disorder as the latter is the most probable state (Eigen, 1971; Ebeling, 1978; Ebeling and Volkenstein, 1990; Collier, 1986; Elitzur, 1994; Corning and Kline, 1998). It is, of course, a disorder of a different kind that has nothing to do with a disorder and disorganization of macroscopic systems (running ahead, this is where Zucker's and Oliver's use of entropy flows). Information is the opposite of entropy since an increase in entropy means a decrease in information and vice versa (Brillouin, 1950; 1956; 1961; Eigen, 1971; Ebeling, 1978; Volkenstein and Chernavskii, 1978; Volkenstein, 1977; Feistel and Ebeling, 2016) and information is a subject to the Second Law as left to its own, as, like other forms of order, information tends to decrease and degenerate into random noise (Elitzur, 1994). In a nutshell, entropy is about probability and the law of increasing entropy is a law of diminishing information, increasing uncertainty and disorder. It is about a system that over time moves from a highly organized, certain and improbable state towards the most probable state – the one where the maximal entropy level corresponds to the highest level of lost, unavailable and irrelevant information about the state of the system and external environment (Volkenstein, 2009). This state implies a loss of knowledge, control and results in the organization's inability to function. Once highly ordered, organized and improbable structure drowns in the chaos of information entropy. Thermodynamic equilibrium corresponds to the highest degree of disorder since over time the most probable configuration is realized, the one that corresponds to the maximum entropy (Ebeling, 1978). The maximum entropy, in turn, corresponds to the equilibrium of the system; therefore, a non-equilibrium state is a characteristic of organized structures, and hence of low entropy.

4. Information and entropy

For organization theory and institutional theory the problem of entropy is the problem with information gathering and processing (Feldman and March, 1981). Typically, this problem manifests itself in two problems – of a lack of information and of information overload in organizations. The second problem can be formulated as follows:

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"*Organizations and their members are affected by the ever increasing quantities and varieties of information (data) they are required to process.' Organizations and their members, however, have limited information processing capacities. The combination of more information and limited information processing capacities has led to the phenomenon called information overload*" (Schick et al., 1990:199).

The problem of limited capacities, knowledge, resources, attention and time for efficient information-processing and decision-making constitutes one of the central themes in organization theory at least since March and Simon's (1958) landmark book "Organizations". Organizations are filled with "*ambiguity, confusion and complexity*" (March, 1982:4; March and Olsen, 1975; Willmer, 1977). What misses in the subsequent literature is the notion of entropy and laws of information degradation. Introducing information entropy into analyzes must reveal a theoretical and practical limit of organizational activity and information processing capability. This limit essentially excludes infinite increasing of information-processing capabilities, efforts and resources.

Information is a fundamental level where biological, physical or socio-economic systems can be understood and described via the same principles and common patterns can be distinguished (Stonier, 1996). In the 20th century, Shannon generalized the notion of entropy and unified information with physical concepts by introducing the concept of information entropy[6]. The whole century marked a grand unification of information as a key notion that bridges most fundamental scientific problems, theories and fields of research (Stuart, 1985a;b; Volkenstein, 2009; Corning and Kline, 1998; Wang et al., 2000; Cárdenas-García and Ireland, 2019; Natal et al., 2021). Information and information entropy are other forms of thermodynamic phenomena and they manifest themselves in statistical terms, relating to the probability with which a particular kind of event or state of matter can be expected to occur (Wicken, 1978:101). Schrodinger, Brillouin, Eigen, Wiener were among those physicists who accepted information theory as complementary to classical statistical mechanics and believed the information is another manifestation of thermodynamic processes. Wiener and Eigen argued that information can be regarded as a new variable in physics (Eigen, 1971) and as a physical property, information exists and "behaves" according to the laws of physics. That's why, for instance, the black hole information paradox poses such a serious problem for physics: if the information is truly lost this means that a range of fundamental laws and theories are either wrong or incomplete (Susskind, 1997). Nevertheless, once we recognize the physical nature of information, we accept that any other system that deals with information is not an exception to the laws of physics. As Wicken notes, processes within these systems "*all occur within the constraints of the Second Law of thermodynamics; that is, they all generate entropy, which according to the standard interpretations, is reducible to the concept of statistical order*" (1978:191). Therefore, any such system is subject to the thermodynamic cost of information manipulations (Mitrokhin, 2014; Parrondo et al., 2015; Mizraji, 2021), in particular, since such

[6] Note that we refer in this paper to valuable and useful information. It is the value and meaning of information that is omitted and ignored in Shannon's mathematical theory of communication. The latter is largely associated with the concept of entropy in information sciences. Standard (Shannon's) information theory was concerned with the problem of measuring uncertainty in the communication of messages between a sender and a receiver and neglected the question of the content of information.

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manipulations drive these systems away from thermodynamic equilibrium and most statistically probable state.

The notion of entropy originates from statistical thermodynamics and represents one of the most fundamental concepts in science (Mavrofides et al., 2011; Bawden and Robinson, 2015; Bratianu, 2019; Bratianu and Bejinaru, 2020). The Second Law of thermodynamics states that the entropy of isolated systems left to spontaneous evolution cannot decrease, as they always arrive at a state of thermodynamic equilibrium, where the entropy is highest. It is an irreversible process that implies a progression in time towards equilibrium (Ebeling, 1978; Volkenstein, 2009). When formulated in statistical terms at the level of information, the system tends to its most likely state. It is a drift towards the most probable state and this probabilistic perspective unifies and generalizes physical, biological and social phenomena. Being probabilistic in its nature, the law of entropy predicts an irreversible change from less probable to most probable structures, states and configurations (Ebeling, 1979; Elitzur, 1994). Physical, biological and socio-economic phenomena must obey the Second Law (Pross, 2003) because they can be ultimately reduced to information holding, processing and exchange (Wicken, 1978; 1979; 1980; 1986; Stuart, 1985a; Grabow and Andrews, 2019). Rusting of cars, diffusion of ink in water and organizations' inability to cope with information overload and environmental uncertainty - all these phenomena are caused by the increase of possible configurations. All of them move towards equilibrium, they erode due to ever-increasing information noise and are lost in ever-increasing details, irrelevant, ambiguous, wrong and hidden information. Once certain, organized and predictable structure degrades and disperses towards the most likely state, that is, chaotic and uncertain.

As Wicken (1986) noted, Shannon's generalization of entropy can be considered as a waited "*freeing [of entropy] from the special disciplinary framework of thermodynamics*" (1986:276; Haddad, 2017). Although since then much confusion and ambiguity have been generated in attempts to define, explain and find a domain of application for such concepts as entropy, information and uncertainty, the most prevailing interpretation is the one, associated with Wiener's view on entropy as a measure of uncertainty, disorder and lack of knowledge (Bawden and Robinson, 2015). In this paper we follow this understanding of entropy in social systems (including, first of all, human organizations) as a link between entropy and missing, hidden information (Bawden and Robinson, 2015; Susskind, 2008). For Schrodinger, entropy characterizes the amount of "unknowledge" and, as such, a decrease of entropy signals an increase of information and knowledge (Eigen, 1971). Wiener opposes entropy to information and together with many other scientists (including Brillouin and Susskind) specifies the opposition between entropy and information: entropy is the opposite of information (Bawden and Robinson, 2015). Traditionally, the following characteristics and associations between information, entropy, uncertainty, order and complexity are necessary peculiarities of information entropy in social systems:

1a. The amount of information in a system is a measure of its degree of organization (order);
1b. The entropy of a system is a measure of its degree of disorganization;
2a. The entropy of a system is positively associated with losing information and increasing uncertainty;
2b. Increasing information about the system is positively associated with decreasing entropy and uncertainty.

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Susskind (2008) concludes that entropy is an amount of hidden information: that information that is unavailable and lost in details as it is difficult if not impossible to uncover them. In most cases, there are too many details to keep track of them and be able to gather and proceed with all necessary information (Volkenstein, 2009; Adami, 2016). Information entropy is thus a measure of the difficulty of knowing the present and complete state of the system (Schuster, 2016; Haken and Portugali, 2016). Entropy is hidden information and the higher the level of entropy the more information about the current state of an organization is unavailable. Maximal entropy relates to a complete disorder of a system and, consequently, a minimum or complete loss of information (knowledge about a true state of the system). Maximum entropy reflects maximum uncertainty and vice versa. A minimal entropy relates to complete or very high order, certainty and, therefore, information. An increase in disorder is accompanied by both an increase in entropy and a decrease in information. The useful information increases when entropy decreases. Therefore, over time, entropy and valuable information change in opposite directions.

5. Deinstitutionalization, disorder and entropy

So, what was missing and mistaken in Zucker's and Oliver's account of entropic tendencies and deinstitutionalization? Does organizational entropy exist? Does it suggest natural tendencies towards erosion or decay of institutional phenomena (Oliver, 1992:580)? Does institutional theory permit the very existence of entropy? What is then a norm for organizations and organizational fields – persistence or erosion? Do tendencies toward entropy will be stronger in the long run than tendencies towards isomorphic convergence, stability, inertia and resistance? For institutionalists, the problem was with the notion and understanding of the disorder. As with many other misinterpretations and misunderstandings of entropy in social sciences, in their assumptions entropy is confused with disorder in the macro world (Styer, 2000; Koutsoyiannis and Sargentis, 2021). Entropy was introduced into institutional theory straightforwardly as a factor of disorder, erosion and decay of institutions. And as Styer reminds us, "*disorder is a metaphor for entropy, not a definition for entropy*" (2008:1031).

But what is the true unit of analysis, what tends towards disorder and what is subject to erosion, decay, disorganization and deinstitutionalization? Zucker attributed the tendency towards disorder to organizations and institutions as social structures:

"*organizations in general are 'typified as tending towards disorganization or a 'gradual erosion of the[ir] taken-for-granted character*" (Zucker, 1988:26).

Scott (2015) supported this view and treated institutions as social systems and, as such, these systems are subject to entropic forces. Further, the institutional work perspective reinforces this assumption by stating that taking an institution for granted is not sufficient for its survival (Montgomery and Dacin, 2020) and that most (if not all) institutions require maintenance efforts by field members. For example, Lok and De Rond justify institutional work as a necessary

condition that is "*required to overcome the entropic tendencies that characterize most institutions*" (2013:185). Dacin et al. (2010) assumed that efforts to maintain an institutional order are needed "*to avoid institutional erosion and drift*" (2010:1393). This assumption seems to imply that institutions and institutionalization are not natural structures, processes and states and without purposeful efforts they are doomed to break down, erode and fade away. The taken-for-granted character of institutions and thus their legitimacy, social support and manifestation in material prevalence tend to decrease over time. In Zucker (1988) and Oliver (1992) this tendency is expressed as almost a zero-law of institutional theory and organizational sociology. A key purpose of the 1992 paper was to argue that "*the persistence and longevity of institutionalized values and activities may be less common than the emphasis of institutional theory on cultural persistence and the diffusion of enduring change implies*" (1992:584). That is, according to Oliver (1992), in the absence of external disturbances, a tendency for institutionalized practices, norms, understandings and other social structures is to decrease in the level of institutionalization.

At the same time, in Oliver's (1992) theory of deinstitutionalization threats to the institutional status quo originate mainly from external sources. "Random external occurrences", "dissonant events" or "increasing resource or domain competition" are exemplary external factors of deinstitutionalization. As the task of this theory is to explain whether and how the legitimacy of an established practice erodes and discontinues, external factors are the most obvious candidates for the role of such causes. But a conclusion can be made that without these external disturbances an organizational field moves towards increasing institutionalization and approaches complete institutional homogeneity. And it is a correct account of institutionalization an institutional order. Institutional continuity is the norm and organizational fields tend towards institutionalization via self-ordering and self-organization mechanisms (DiMaggio and Powell, 1983; Aksom and Tymchenko, 2020; Aksom and Firsova, 2021; Aksom, 2021). This means that a state of institutionalization and a tendency towards increasing isomorphic pressures is a natural order of things; in the absence of external disturbances, institutionalization is what is expected. Conscious efforts should be made to create and maintain order. Otherwise, it will end up in a state of disorder. In the next section, this point will be evident as we explain why it is information, not a social structure that is subject to entropy.

6. Reintroducing entropy into institutional theory

6.1. Institutionalization as a decrease of useful information

Like physical systems, a social system also evolves—in the direction of maximum entropy. But it is important to understand the unit of analysis – what is subject to entropy? Those papers that mention the phenomenon of institutional erosion and decay refer to organizational practices (Oliver, 1992; Lok and de Rond, 2013; Raynard et al., 2021). In the theory of deinstitutionalization Oliver rightly acknowledges and introduces the concept of entropy but confuses the cause and effect as entropy in this theory erodes institutionalized practices. On the contrary, entropy increases from a more ordered and informative state of a system to less informative, more uncertain and less ordered. Entropy does not erode institutions; it blurs and

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destroys formerly technical solutions. It is entropy that forces "*rational economic activity… to become infused with beliefs and meanings*" (Zilber, 2006:281).

Why then entropy is associated with the strengthening of institutional forces and complete institutionalization and not with decay and erosion of institutionalized practices? As it was noted, the system tends to its most likely state and the absence of information and complete uncertainty is the most likely state of any organizational field. Organizations are filled with ambiguity and limited, bounded rationality (March and Olsen, 1975; 1976; March, 1982). Over time, the problem with searching, processing and using valuable information only increases due to information overload and cognitive limits of organizational members.

Erosion of a management practice means it is disconnected from the reality of the external environment and does not reflect the knowledge of causal relationships anymore and for any practical reason is useless in terms of efficient response to environmental challenges. Instead, an institutionalized practice offers nothing but an institutional discourse, a belief in norms of rationality and progress (Abrahamson, 1996; Green, 2004). This absence of information in institutionalized environments is best conceptualized in Abrahamson's management fashion theory. In institutionalized environments management concepts are believed to be rational and progressive. And a management fashion is nothing but a transitory collective belief (Abrahamson, 1996). It is about the appearance of rationality and progress. Management fashion-setting communities sell entropy instead of valuable information. There is a probability that new fashionable concepts may be both real efficient tools for solving real problems and simple institutional myths containing no relevant information on how to handle environmental challenges. It is the same situation as with tossing a coin or casting a die – in all these instances there is high entropy and one cannot determine the outcome as the entropy of the unknown result is maximized.

And what are fashionable concepts, institutional beliefs and norms in terms of information? The answer is that they reflect the lack of a correct answer, the inability to have information. Institutionalization reduces the amount of useful and valuable information (Volkenstein, 1977; 2009). The greater the extent of institutionalization, the greater the extent of uncertainty with regard to the goals, means of their attainment and cause-effect relationships. Institutionalized practices embody and reflect the absence of valuable information because organizations cannot extract any valuable information from their environment and institutionalized meanings and signals are all that remain. In *The Recognition Problem* Bongard (1967) linked the value of the information with the increase in the probability of achieving some objective as a result of having this information. For organizations in mature institutionalized fields, the probability of achieving the relevant aim before and after receipt of the information does not increase.

And if so, institutional decisions reflect the most typical reactions: entropy leads to the fact that instead of the most rational and informed decisions, organizations make the most typical ones for their institutional context. When there is no information, organizations come to a single optimal consensus - to imitate the most common practices, those that symbolize rational, efficient and proper decisions. The final equilibrium for the organizational field is the structural isomorphism between organizations with respect to the most common (and if so, the most statistically probable) decisions.

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It was one of the central tenets in institutional theory that uncertainty increases over time and increased institutional pressures correlate with increased uncertainty (Strang and Still, 2006; Scandera et al., 2022). These early institutional studies had no trouble in relating institutional effects to uncertainty (DiMaggio and Powell, 1983; Galaskiewicz and Wasserman, 1989). Uncertainty means the absence or a lack of valuable information (Daft and Lengel, 1986). Just like a homogeneous world would not contain any information (Volkenstein and Chernavskii, 1978), institutional homogeneity leads to a dramatic decrease in the value of information in the field. Institutionalization thus can be seen as a special case of an increase in entropy and decrease in knowledge. DiMaggio and Powell's article already contained an explicit clue linking institutionalization with homogenization, uncertainty and imitation. These phenomena arise and prevail when the value of information decreases.

6.2. Institutionalization vs. entropy.

Entropy does not increase in already institutionalized practices because institutionalization is a cause of maximized uncertainty, so we should not expect that entropy will erode and deinstitutionalize highly institutionalized practices. On the contrary, these practices are institutionalized because entropy corroded their technical meaning. Entropy increases in the information space of the organizational field. Institutional isomorphism is the logical end state for organizational fields where uncertainty is very high and a technical value of organizational practices is lost and replaced with institutional meanings and symbols. That information is dissipated and uncertainty increases is a consequence of the growing entropy. Innovations always emerge as solutions to certain real problems. Innovations are informational responses that contain relevant and true information gathered from the environment for the purposes of creating certainty or reducing uncertainty (Willmer, 1977; Mellemvik et al., 1988). As has been mentioned in previous sections, institutionalization is manifested "*as a means of instilling value, supplying intrinsic worth to a structure or process that, before institutionalization, had only instrumental utility*" (Scott, 1987:494). Completely institutionalized practices had been defined by Meyer and Rowan as rational myths that "*identify various social purposes as technical ones and specify in a rulelike way the appropriate means to pursue these technical purposes rationally*" (1977:343–344). And over time, purely technical practices and solutions eventually become reflections and symbols of institutional myths and beliefs[7]. It must be recognized as a natural process that once a technical solution eventually degrades to the level when it is nothing but a reflection of institutional order and existing social values, meanings and symbols (Jepperson, 2002; Zilber, 2008; Suddaby et al., 2010). Instead of collecting and using relevant and true empirical information for efficient decision-making, organizations in institutionalized environments have to learn "*highly abstract and symbolic accounts of society*" (Jepperson,

[7] Zbaracki rightly defines this distinction between technical and institutional as a key idea of institutional theory, as it describes a process whereby "*the symbolic value of something like TQM ultimately supplants its technical (efficiency) value*" (1998:603), In case of TQM, this innovation "gains institutional value over time because it becomes the accepted way of doing things… using TQM may provide an organization with little technical benefit, but the claim to use TQM confers legitimacy on the organization" (Westphal, Gulati, and Shortell, 1997). Consequently, managers will use the rhetorical TQM to gain legitimacy without affecting activities at the technical core of the organization".

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2002:232). Institutions are beyond any individual judgment or evaluation and their structure and power are based on learned beliefs:

"the truly fundamental beliefs for reproducing a social order are people's beliefs about others' behavior and beliefs; the basic "myths" of society operate primarily by establishing beliefs about what others think and expectations about how others will behave" (Jepperson, 2002:232).

Operating and behaving in an institutionalized environment implies believing rather than knowing but in a specific sense: interacting with taken-for-granted categories means actors "*know that other know*" (Jepperson, 2002; Meyer, 1977). This behavior is an outcome of information uncertainty.

6.3. Institutions, entropy and stability

In this last section, we explain, based on the probabilistic interpretation of the Second Law of Thermodynamics, why institutional stability and persistence are more probable than institutional change and decay. Put differently, institutionalization and institutional isomorphism are about probability and hence about the most probable state. The Second Law claims that the probability of a particular state increases exponentially with its entropy. It is the Second Law that postulates that systems tend to be transformed from less stable to more stable; from less probable to more probable. The most probable means the most stable. As has been discussed in previous sections, disorder arises spontaneously, being associated with greater probability and greater entropy (Volkenstein, 2009). The reason is that a disordered state is more likely than an ordered one. For a given system, a less ordered state has a larger statistical weight since it can be realized in more ways than a more ordered state (Volkenstein, 2009).

From the statistical point of view, institutionalization is the most probable and the most stable state. The reason is that institutionalization is a realization of the most probable state – the one with minimum valuable information – while a technically efficient practice that solves certain problem(s) is a rare and highly improbable social structure. A technically efficient practice tends to disconnect from once relevant information and without valuable information, this practice is nothing but an institutional artifact. Recall that when left to itself a system rapidly proceeds to the disordered most probable state. In contrast, institutional belief is an aggregated mix of uncertain information; it is a product of uncertainty. Institutionalized practices offer no certain knowledge; they are nothing but a reflection of the lack of understanding of means-ends relations (DiMaggio and Powell, 1983; Strang and Still, 2006). Imitating others' choices is the most probable option when environmental uncertainty hinders any relevant information for efficient and reliable decision-making. Institutionalization as a value infusion means blurring, erosion and "forgetting" of a once highly order and organized state. Before institutionalization, an increase in entropy of a system signifies a gradual "forgetting" of its earlier more ordered and informed states (Volkenstein, 2009:102). Entropy thus reflects the degrading from highly ordered, nuanced receipt for a limited and specified range of problems towards most typical institutional templates with little relevant information.

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It is therefore not correct to say that institutions are subject to entropy: entropy pushes systems towards the most probable state and a complete institutionalization of any organizational practice is the most stable configuration for any social system, that is, with maximal uncertainty[8]. Entropy increases in organizational fields and mature institutionalized fields and institutionalized practices and isomorphic organizations are outcomes of high entropy and minimum information. Organizational practices as solely technical tools are rare, improbable and well-designed and sophisticated systems while institutionalized systems lose this quality as they reflect the dominant institutional order, that is, the most probable and stable meaning in a given field. It is the most probable and typical outcome – to reflect the prevailing meaning structure and taken-for-granted beliefs and understandings. Institutionalized practices are therefore not subject to entropy; institutionalization as the most probable outcome in any emerging organizational field is a result of increasing entropy of once solely technical solutions. A former solely technical practice corresponds to maximum entropy; a completely institutionalized practice approaches the state of maximum entropy, that is, it contains no relevant information and reflects uncertainty. An institutionalized practice manifests and reflects the absence of knowledge because it implies believing rather than knowing (Meyer and Rowan, 1977; Mellemvik et al., 1988; Jepperson, 2002), manifests myths about efficient ways of organizing, not real solutions based on real and updated empirical information (Feldman and March, 1981). Scott motivates the introduction of entropy into institutional analysis by arguing that "*like all systems, institutional arrangements are subject to entropic forces" (2015:472)* but institutionalization as a state is an absence of any system and order (in informational terms, of course).

7. Concluding remarks

This paper is the final in the trilogy devoted to theoretical paradoxes and inconsistencies in institutional theory, discussed in a series of papers in the International Journal of Organizational Analysis (Aksom, 2021; 2022a). In this third and final paper of the series, we aimed to clarify and reintroduce the notion of entropy into institutional theory and solve the inconsistency between such mutually exclusive phenomena as institutionalization and the erosion and decay of institutions. It is hoped that these papers shed a light and explain the difficulties associated with the notion of institutional change and its uncritical use. One of the aims of these papers was to argue that institutionalists tend to overestimate the flexibility and capacity of institutional explanations. It is simply wrong to treat any phenomena as institutions or institutional effects and any change as institutional. In most cases, researchers face non-institutionalized practices and structures and observe typical cases of routine organizational change. Deinstitutionalization, institutional work or institutional entrepreneurship are examples of treating anything as institutions and institutional change. That actors strategically respond to institutional pressures,

[8] Institutionalization is the most probable state and is more probable than a state of pure technical solutions because having non-institutionalized practices requires 1) gathering information and 2) gathering relevant and valuable information. Institutions do not require any information; they replace the information with symbols, beliefs and meanings.

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manage and resolve institutional complexity, create, maintain and disrupt institutions or symbolically comply to gain legitimacy only means that researchers who "report" these phenomena simply do not deal with real institutions. These are instances of organizational change. In this sense, arguments developed in these papers should make it more difficult for organizational scholars to play the "institutional change" card and produce theoretically and logically weak accounts of deinstitutionalization, institutional entrepreneurship, institutional work and institutional complexity. Institutional theory is an elegant and nuanced theoretical system and unskillful attempts to arbitrary "develop" and "fix" it with any sort of change create paradoxes and internal inconsistencies.

We aimed to clarify the nature and role of entropy in institutional theory and, by doing this, resolve an inconsistency between the view of entropy as a natural tendency towards the erosion of institutions (Oliver, 1992) and the tendency of institutional forces to increase over time and persist (DiMaggio and Powell, 1983; Meyer et al., 1997). Drawing from information theory we have conceptualized institutionalization as a decrease in valuable information and an increase in uncertainty in organizational fields.

While previous studies examined the plausibility of claims about functional and social causes of deinstitutionalization (Aksom, 2022a), in this paper the problematic nature of the very possibility of deinstitutionalization has been explored from the perspective of entropy vs. institutionalization paradox. We argued that entropy is not a cause of the decay or erosion of institutions. It is a manifestation of the decrease of valuable information and without this kind of information, organizations are more susceptible to institutional meanings. Left to itself, the system goes into the most stable and statistically probable configuration - with the highest entropy. The maximum entropy for the organizational field corresponds to the absence of useful information about the environment, and institutional practices that display the most typical patterns and are the only possible for the institutional field since they do not depend on information and do not need it. The maximum entropy of institutionalized practices is the product of beliefs and understandings, not of knowledge and information. Organizations use them and "know" that this is the most typical, "natural" solution to a given problem.

If emerging fields contain new information, informed strategy, and highly organized and ordered interactions between several organizations, then over time, information is lost in white noise, and full institutionalization corresponds to the maximum uncertainty of the organizational field, as also suggested by the classical 1983 institutional theory (DiMaggio and Powell, 1983; Mellemvik et al., 1988; Abrahamson, 1996; Strang and Still, 2006). In particular, mimetic isomorphism results "*from standard responses to uncertainty*" (DiMaggio and Powell, 1983:150). Organizations imitate the most common templates, responses and solutions in order to reduce uncertainty. While there is little or no relevant and reliable information in a highly institutionalized environment, such quintessential institutional practices and procedures as, for example, accounting offer the most average response which is also far from being optimal, allowing avoiding worst scenarios that are eliminated from a repertoire of organizational practices.

6.1. Implications for institutional theory

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The new understanding of organizational entropy that we offer has implications for a variety of topics in institutional theory such as institutional change and stability, deinstitutionalization, institutional maintenance and decision-making under conditions of uncertainty. Most importantly, the paper offers a better theoretical justification and understanding of the nature of institutionalization and the persistence of institutionalized practices. It is argued that institutional maintenance and reproduction do not pose any theoretical problem for institutional analysis. It was aimed in this paper to defend the view of institutions as enduring practices that do not require to be maintained by purposeful and deliberate efforts and which cannot be "deinstitutionalized". At least cannot happen as easily and theoretically free as theories of deinstitutionalization and institutional work assume. By exploring and revealing the true nature and characteristics of institutional entropy it was shown that entropy is another factor that contributes to institutional isomorphism and institutional persistence and longevity.

Entropy is not a factor that causes the decay and erosion of institutions; it is a reflection of institutionalization. In particular, it is argued that it is not an institution that is subject to entropic tendencies but the value of information and information-processing capabilities. Seen from this perspective, the presence and manifestation of entropy make sense and appear consistent with the basic tenets of institutional theory. The relationship between entropy, information, uncertainty and institutionalization is better specified when seen through the lenses of information theory. Considering entropy from the perspective of the information theory allows understanding of why institutionalization occurs and why it is an inevitable, natural process of self-ordering and self-organization in organizational fields.

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