



HAL
open science

Extitutional Theory: Modeling Structured Social Dynamics Beyond Institutions

Primavera de Filippi, Marc Santolini

► **To cite this version:**

Primavera de Filippi, Marc Santolini. Extitutional Theory: Modeling Structured Social Dynamics Beyond Institutions. *Ephemera: Theory and Politics in Organization*, In press. hal-03513198

HAL Id: hal-03513198

<https://hal.science/hal-03513198>

Submitted on 18 Jan 2022

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

Extitutional Theory:

Modeling Structured Social Dynamics Beyond Institutions

Primavera De Filippi—CERSA/CNRS/Université Paris II

Marc Santolini—Université de Paris, INSERM U1284, Center for Research and Interdisciplinarity (CRI), Paris, France

Abstract

Interaction among individuals underlies all social processes. Underpinning the emergence of complex social organisations is the ability for individuals to influence one another, either directly, through peer pressure and social reinforcement, or indirectly, through the establishment of larger social structures, such as communities, families, companies, governments, and many other types of institutions. Several theoretical frameworks have been developed in a variety of disciplines to understand how individuals organise themselves into these social structures and how these social structures in turn contribute to shaping individual attitudes, infrastructures, tools, behaviours, ideas and beliefs. The concept of institutions is particularly central to most theoretical frameworks in the field of organisational and governance theory. While some of these frameworks focus on the structural properties of social groups that support or reinforce intended social interactions, others focus on social environments and cultural phenomena as a means to investigate how culture affects social dynamics and individual practices in the context of interactive and relational social structures. Yet, while most of these frameworks do recognize the interplay that subsists between the structural elements and the cultural components of these social groups, they often assimilate both of these components into a monolithic framework of analysis—thereby limiting the opportunity to distinguish between the different logics that animate each of these components. In this paper, we introduce an integrated theoretical framework to analyse the interplay between formalized social structures composed of codified roles and rules which are commonly described as “institutions”, and the more latent interpersonal relationships that shape and animate these institutions—we introduce the notion of “extitutions” to describe the latter. The main contribution of this paper is to provide an ontological framework to characterize the reciprocal interactions between the extitutional and institutional aspects of social groups, explicitly disentangling their respective influences in order to better comprehend the operations and dynamic evolution of these groups. The paper builds upon neo-structural sociology to elaborate a comprehensive framework of analysis for advancing the formalisation of both institutional and extitutional dynamics and how they affect or influence each other over time from a multi-faceted and multi-layered network standpoint.

Keywords: *institutions, extitutions, social dynamics, complex systems, network science, organisational theory, governance theory.*

I. Introduction

1. What is an institution?

The concept of institutions is perhaps one of the most controversial concepts in social sciences. Originally introduced to describe the specific structure of organizations, institutions soon became a catch-all for a large variety of social phenomena. A few definitions have been proposed in the literature, as an attempt to describe the role and function of institutions. Weber (Weber, 1910) advocated for a broad and encompassing definition of institutions, arguing that the term "society" should be replaced with the terms "social relations" and "social institutions" —where institutions represent the "rules of the game" (*Spielregeln*) that inform human behaviour (Nau, 2005).

Other authors focused more on the shared practices, customs and behavioural patterns that constitute an institution. For instance, (Hamilton, 1932) described institutions as a permanent and recognizable "way of thought or action [...] embedded in the habits of a group or the customs of people" (p. 84), whereas (Foster, 1981) defined institutions as "prescribed patterns of correlated behavior" (p. 908). These definitions have, however, been somewhat criticized (Lawson, 2003) (p. 189–194) for putting too much stress on the behavioural aspects of institutions, and not enough attention on the formal rules and constraints that shape these behaviors.

More formalistic definitions of institutions have been provided by other scholars, such as (Knight, 1992), who describes institutions as any "system of rules that structure social interactions" (p.2). Such a definition has however been criticized for being excessively broad (Hodgson, 2006), in that it comprises a wide range of social and cultural artefacts of very different nature—such as language, money, law, social norms, governments and firms. Knight's definition is also limited to the extent that it only focuses on the structural ruleset that constitutes an institution, with little account for the role of individual preferences and dispositions in shaping and putting into practice these rules.

Behavioural approaches in organization theory (Griffin & Moorhead, 2011; Newstrom et al., 1993; Robbins & Judge, 2015) tried to bridge that gap, exploring the link between the structural elements of an institution and the way people act within that institution.¹ However, these works are anchored in the field of management and business administration; their focus is mostly on the practical and operational matters on how to run an organisation, without providing a comprehensive model for understanding the interplay between the structural and behavioural aspects of an institution, beyond the organisation field.

¹ (Griffin & Moorhead, 2011) define Organizational Behaviour as "the study of human behaviour in organizational settings, the interface between human behaviour and the organization, and the organization itself."

Today, while there is no single nor widely established definition of institutions, they are commonly accepted as encompassing both explicit rules (formal or informal) and the tacit attitudes or social norms that represent the embodiment of these rules. Indeed, “institutions both constrain and enable behaviour” (Hodgson, 2006). Specific rules and constraints are established in order to guide, promote and support specific actions or behaviours that would be difficult—perhaps even impossible—to achieve otherwise. For instance, language enables us to communicate more easily with one another, money enables us to trade more effectively, law enables us to act more freely based on expectations of mutual respect, and governments enable us to pool resources together and act in a more coordinated manner. At the same time, the on-going use and acceptance of these rules contribute to their tacit adoption and assimilation within the social fabric of an organisation. This reduces their need for enforcement as they are no longer perceived as behavioural constraints, but rather as behavioral habits.

In other words, institutions can be described as a combination of rules that generate relatively stable equilibria of social behaviours which persist over time (Aoki, 2001; Crawford & Ostrom, 1995)). These rules reinforce themselves—by acquiring more normative weight—as they are recognized, accepted, internalized and replicated through the behaviours of individual actors (Hodgson, 2006). Such a dynamic understanding of institutions enables us to better grasp the interplay between individuals and institutions, focusing on how individuals simultaneously shape and are being shaped by the institutions they create. It is this continuous back and forth between the establishment of normative rules and the assimilation of these rules by individuals that determines the long-term sustainability of institutions.

2. How do institutions evolve?

Among the multiple theories of institutional change (Kingston & Caballero, 2009), some focus on the deliberate attempts at creating new institutional forms in order to better achieve a particular purpose or satisfy specific needs and desires. These theories understand institutional change as a result of deliberate intervention by political or economic actors (Alexander, 2005). They investigate the design choices stemming from these particular sets of actors, whose evolving preferences, knowledge and beliefs generate progressive variations in institutional forms.

Institutions do not, however, exist in a vacuum; they subsist in a particular social, political and economic context, which they must attune to. As the context in which they operate becomes more complex, institutions need to adapt to their changing environment by either modifying their institutional structure or by extending beyond their original organizational boundaries, so as to better connect and communicate with a wider variety of social systems (Andersen, 2001; Andersen & Born, 2007).²

² According to (Andersen, 2001), *polyphonic organisations* are connected to several systems, coupling previously separate concepts, *e.g.* political organisations, market-oriented political parties, ethical investment firms.

Some scholars have theorized institutions from an evolutionary perspective, investigating the process of institutional formation as a spontaneous phenomenon triggered by changes in the larger ecosystem. Specifically, evolutionary theories of institutional change analyse variations in institutional forms through the application of generalized Darwinism laws (Lewis & Steinmo, 2012), whereby different institutional forms compete with one another for survival. According to these theories, institutions are regarded as social structures, whose attributes and characteristics progressively evolve as a result of external pressures and environmental stimuli (Potts, 2007). Those that best accommodate existing social, economic, and political arrangements will have higher chances to survive—spreading through a process of imitation or replication—whereas those that are the least fit for their environment will eventually fade into extinction.

Beyond external or environmental pressures, institutions may also evolve as a result of internal social pressures, as a response to the individual expectations of its constitutive members. As such, while in an ideal-typical Weberian bureaucracy, organizations are "designed to function independently of the collective actions which can be mobilized through interpersonal networks [...], when turnover is low, relations take on additional contents of an expressive and personal sort which may ultimately transform the network and change the directions of the organization." (Lincoln, 1982) (p. 26) Conversely, substantial company turnover could equally trigger significant changes in the structure of an institution, as different directors or employees may have different ideas or expectations on how the company should effectively be run.

There are, however, situations where the individual elements of social groups will experience substantial variations, without triggering an actual change in the institutional formation. For instance, replacing a company's CEO will most likely have a significant impact on the network of interpersonal relations that had previously been established within the company. Yet, none of these changes will be reflected within the institutional structure of the company, which remains essentially the same: the role of the CEO has simply been assigned to a new individual, but the set of rules and functions associated with that role has not been affected by it. Similarly, the coming and going of volunteers participating in the operations of a non-profit organisation remain invisible from an institutional perspective, since volunteers are not officially part of the institutional fabric. Yet, the involvement of volunteers is essential to the success of many non-profit organisations, and the departure of key volunteers could trigger a significant drop in the involvement and participation for other volunteers. Hence, even if not formally or explicitly reflected in the organisation structure, changes in the social fabric of an organisation could have drastic consequences on the operations of that organisation.³

³ In the words of (Granovetter, 1985), "it hardly needs repeating that observers who assume firms to be structured in fact by the official organization chart are sociological babes in the woods"

3. The multiple facets of institutions

These examples show that there are important factors affecting social dynamics which do not only refer to the institutional aspects of social groups or organizations, but also to the relational aspects thereof. Indeed, every social organisation exhibits both institutional and non-institutional forces that together contribute to shaping the social dynamics of all those involved in such organisation. Specific typologies of social organisations (e.g. companies or governments) have strong institutional components that govern the large majority of social dynamics, with a view to influence social behaviour towards the achievement of a particular objective or mission. Yet, there exist many other types of social organisations, which prioritize interpersonal relationships and personalised social dynamics over institutionalized ones. This is the case of many informal groups, self-organised communities, but also large-scale organisations which account for both the structural and relational forces affecting social dynamics (Laloux, 2014).

To be sure, many of the structural components of an institution are intended to support or constrain specific social dynamics, which are to be either encouraged (e.g. promoting emotional care and positive work relationships) or discouraged (e.g. avoiding corruption, conflict of interest, etc). To properly do so, however, these structural components need to account for the interpersonal relationships occurring within these social structures, and the impact these have on the broader social dynamics. In order to facilitate this task, we need to distinguish between the impersonal and structural components of institutions, defined by a particular set of roles and rules, with the more personalised and relational components. This distinction is useful to facilitate the analysis of the generative process of coevolution that exists between institutions and extitutions—shedding light on the interplay between the different aspects of social groups and organisations: the codified normative rules and the personalised network of relationships between individuals operating within that social group.

The relationship between institutions, social norms and individual behaviors has already been analysed by scholars from a variety of disciplines, including economics (Alesina & Giuliano, 2015; Bowles, 2004; Dal Bó et al., 2010; Guiso et al., 2015; Tabellini, 2008, 2010), political sciences (Bednar & Page, 2018; Hofstede, 2001; Jackman & Miller, 2004), anthropology (Bennett, 1996; Billig, 2000; Wright, 2004) and even biology (Bowles et al., 2003). Most relevant for the purpose of this paper is the work in structural sociology of (Granovetter, 1985), which builds upon the notion of “embeddedness” as previously developed by (Polanyi, 1944) to argue that market economies, and the social dynamics that emerge within them, are intrinsically embedded within a much broader social and cultural context than traditional economic theories would suggest. Granovetter believes that neoclassical economics prescribes an ‘under-socialized’ and atomized account of human behaviour that is excessively separated from culture and society. At the same time, he claims that Polanyi’s substantivist approach prescribes an

"over-socialized"⁴ view of economic actors, minimizing the role of rational choice over human behaviour. In his account, "most behavior is closely embedded in networks of interpersonal relations and [...] such an argument avoids the extremes of under- and oversocialized views of human action" (Granovetter, 1985)⁵. However, Granovetter limited his field of observation to market societies, with little account for how his neo-substantive theory of embeddedness could apply to nonmarket social organisations more generally.

Another relevant body of literature is the work of (Lazega, 1992, 2020, 2021), who analyses the phenomenon of collegiality, as an alternative organisational logic to the bureaucratic logic (Lazega, 2001, 2020). Lazega considers that most social organisations are complex multilevel organisations that combine these two contrasting logics —bureaucracy and collegiality—to support and enable collective action amongst a variety of (often rival) actors. He distinguishes between "networks of impersonal interactions, often analyzed by identifying predefined groups of members based on ex ante attributes derived from formal hierarchy" and "networks of personalized relationships, with inductively defined clusters of members based on a combination of dyadic, triadic and higher-order relational substructures" (Lazega, 2020). According to Lazega, understanding the interplay between both of these networks is necessary to understand the behaviour of any social organisation.⁶ Yet, more research is needed to formalize and analyse the underlying dynamics that animate these different networks, and how they affect or influence each other over time.⁷ This is the gap that extitutorial theory aims to bridge.

Extitutorial theory proposes an integrated approach to the analysis of structured social dynamics aimed at reconciling these different aspects within a common theoretical framework. It provides an alternative and complementary framework to theorize the emergence, sustenance and evolution of structured social dynamics, by focusing not only on the social structures that shape and influence social norms and behaviours, but also on the individual relationships that emerge within these structures, and that equally contribute to the establishment or to the reinforcement of specific social dynamics. As such, extitutorial

⁴ This view is shared by James Duesenberry who believes that "economics is all about how people make choices; sociology is all about how they don't have any choices to make" (Duesenberry, 1960)

⁵ This intermediate position is also reflected in parallel works by (Burt, 1982). As stated by Granovetter, "There are many parallels between what are referred to here as the "undersocialized" and "oversocialized" views of action and what Burt calls the "atomistic" and "normative" approaches. Similarly, the embeddedness approach proposed here as a middle ground between under- and oversocialized views has an obvious family resemblance to Burt's "structural" approach to action."

⁶ "The main issue is not interplay between formal and informal structures in organizations, but the interplay of two organizational logics, each with its formal and informal dimensions, when they are activated together in everyday collective agency." (Lazega, 2020)

⁷ As Lazega has recognized: "it is important to acknowledge that little is known about the dynamics of multilevel organized settings over time, especially about the synchronization of temporalities of all levels, which is the next frontier of knowledge for the sociology of organizations and collective action." (Lazega, 2020).

theory contributes to the existing literature by providing a new vocabulary and ontological framework to support the description and analysis of some of the non-institutional aspects of social organisations. Most importantly, extitutional theory also provides a set of conceptual tools to analyse the coupling between institutional and extitutional dynamics, with a view to achieve a more comprehensive understanding of social organisations from a dynamic, multi-faceted and multi-layered standpoint.

The term “extitution” has already been used to describe aspects of social life that cannot be subsumed into existing institutional frameworks, in that they have not (yet) taken on a form that is recognisable from an institutional standpoint (Spicer, 2010). Building upon that work, we provide here a formalized account of the interplay between extitutions and institutions, which regards extitutions as the personal and relational counterpart of institutionalised social structures, which are traditionally more rigid and impersonal. In particular, this paper leverages Granoveter’s neo-substantive approach to “embeddedness”, Lazega’s neo-structural sociological approach to bureaucracy and collegiality, combined within a network approach to represent the internal dynamics and operations of extitutions, as well as to help map the interplay between institutions and extitutions in an interdependent framework.

The paper is organized as follows. First, it presents a taxonomy of institutions and extitutions, to subsequently highlight the interplay and reciprocal influence between the two. The paper then provides an illustrated formalisation of the dynamics that emerge within and across the institutional and extitutional layers, to conclude with future perspectives for further research, highlighting the need for a strong interdisciplinary and transdisciplinary approach to accommodate insights from a variety of different disciplines and integrate them into a common theoretical framework.

II. A taxonomy of institutions and extitutions

Social groups are constituted by individuals and the interactions between them. When observing these groups, we can apply different theoretical frameworks to understand the underlying social dynamics that drive these interactions. In this section, we distinguish between the *institutional framework*, focused on the overarching normative and codified structure created to affect and influence these social dynamics, and the *extitutional framework*, focused on the emerging network of relationships associated with the different identities within these social groups. This distinction is not based on the formal vs. informal dichotomy (as noted by Hodgson 2016), but rather on the distinction between explicit and declarative vs. implicit and emergent rules. As such, we distinguish between explicitly declared rules and conventions, formalized into a particular code, which we refer to as *institutions*; and tacitly established habits and shared values embodied by specific individuals, which we refer to as *extitutions*. In other words, institutions are the forces responsible for the establishment and development of new rules and

roles, either *ex-nihilo*, in a declarative manner, or *ex-materia*, resulting from the observation and codification of existing practices to ensure their retention over time. Extitutions are the underlying forces that contribute to both the emergence and embodiment of these social practices, impersonating the roles and performing the rules in a process of constant and on-going experimentation.

We present here a taxonomy of institutional and extitutional dynamics, highlighting their core characteristics and distinctive features. Indeed, while both institutional and extitutional aspects contribute to the emergence and evolution of structured social dynamics, they differ with regard to their nature and modus operandi: their different constitutive elements operate according to distinct logics. Hence, it is important to understand their distinctive characteristics in order to better analyse the manner in which they can each influence the overall social structure to which they refer.

We examine below the distinction between institutions and extitutions with regard to their key defining elements, *i.e.* the basic constituents they are made of; the mechanisms that enable them to come into being and to be recognized as such by other individuals and collectives; the means by which they perpetuate themselves over time, and the enforcement mechanisms they use; the substrate through which they operate; and, finally, the various criteria according to which they can be evaluated.

The goal of this exercise is not to provide a comprehensive overview of the distinctive characteristics and ordering logics of both institutions and extitutions, but rather to illustrate the features of an extitution by contrasting them with those of an institution. Ultimately, our aim is to decouple the notion of institutions and extitutions, delineating their boundaries and dynamics, in order to facilitate the analysis of how their interplay shapes social dynamics.

Table 1. Characteristic features of institutions and extitutions

	Institutions	Extitutions
Basic constituents	Roles & Rules	Identities & Relationships
Creation	Declarative: Normative Structure	Constitutive : Relational infrastructure
Memory	Codified behaviors	Integrated habit
Enforcement	Identified authority	Peer influence
Scaffold	Structure	Culture
Metabolism	Confidence	Trust

Evaluation criteria	Objective	Subjective
---------------------	-----------	------------

1. Institutions

Basic constituents: Institutions are defined by *roles* and *rules* — which, combined, represent the basic constituents or the DNA of an institution (Weber, 1920a).⁸ Roles and rules create basic expectations as to how individuals are expected to behave in specific circumstances, when acting within the framework of the institution. As such, institutions are often characterized by routine tasks and impersonal interactions driven by formal rules (Lazega, 2020). Roles are a particular subset of rules, which are assigned to individuals who match a particular role description, and who will automatically inherit the rights and obligations associated with that role, as defined through the institutional rules. Roles can be associated with specific titles that represent a recognition given by a figure of authority. The rules of an institution define the realm of activities that shall or shall not be undertaken by a particular role, as well as the various ways in which different roles might interact with one another.

Creation: An institution is a **normative structure** that is established through a process of codification recognized by other institutions. The constitution of an institution must be done in a **declarative** manner, via the stipulation of a particular set of roles and rules, recognized by an authoritative figure which acts as a single source of truth.⁹ For instance, a company is created by registering the organisation in a particular jurisdiction, or complying with all the relevant formalities necessary to bring the company into being. Sometimes an institution can be established through a minimum set of formalities, e.g. in most jurisdictions, there are no formal filing or registration requirements needed to create a general partnership. To the extent that it is recognized as such by an authoritative figure (e.g. the state), it will also be recognized by all those who fall within the jurisdiction of such figure.

Memory: The rules and roles that institutions are made of are recorded in the form of codified behaviours in a medium that subsists outside of the human brain. Codification can take many different forms, depending on the type of institution at hand: e.g. the laws and regulations of a nation-state; the bylaws of an organisation; the grammar rules of a language, etc. Such external codification is necessary to ensure the continuity of an institution over time, independently of whether it incurs a change in its constituents. The recording of the rules and roles of an institution on an external medium enables the

⁸ As elaborated by Weber (1920) (Chapter XI of Vol. I) when describing “bureaucratic organisations”, these are characterized, *inter alia*, by (1) the definition of rules ordering activities in jurisdictional areas, and (2) principles of office hierarchy establishing a system of subordination and supervision.

⁹ Some authors recognize informal and uncodified conventions, like language, as an institutions (see, e.g. Hodgson 2016). Yet, we believe that language can itself be decoupled into its institutional (e.g. for the French language: the *Academie de la langue française*, the *Larousse* dictionary) and extitutional components (e.g. the *verlan* slang and other oral dialects, neologisms which are not yet recognized, etc.)

creation of an institutional memory that survives beyond the individual members.¹⁰

Enforcement: Roles and rules establish affordances and constraints. On the one hand, they determine the privileges that an individual enjoys, when assigned a particular role. On the other hand, they determine the duties that the same individual must fulfil with regard to that role. In an institutional framework, both of these aspects are enforced (or at least enforceable) by one or more identified authorities—which may or may not be the same as the one(s) who constituted the institution in the first place. Hence, there is a predictable expectation that, if individuals are caught violating these rules, they will be punished or sanctioned for such a violation.

Scaffold: An institution subsists within a particular **structure** that is normatively codified and that both constraints and enables its operation. Indeed, the structure determines the degrees of freedom within which the institution can act (through the establishment of a particular set of rules and roles) and evolve over time (by establishing rules for changing the rules). Different structures will lead to different types of organisations. For instance, bureaucratic organisations are often described as being too rigid and process-oriented (Weber, 1920b), trapping individuals into an “iron cage” of rationalized procedures and control. Conversely, holacratic organisations that rely on self-organizing architectures require less intermediate levels of checks and balances, and allow for larger degrees of freedom for innovative individual actions (Laloux, 2014).

Metabolism: Institutions facilitate coordination amongst a group of individuals by promoting **confidence** and **predictability** in the way they may or may not interact with one another. Hence, the rules of an institution are intended to create stable equilibria of predictable behaviours that will persist over time. Cooperation is thus achieved through assured reliance, by limiting, constraining, guiding or informing the realm of action available to individuals.

Evaluation criteria: Roles within an institution may be responsible for a set of deliverables or tasks. While the performance of these deliverables or tasks remains ultimately subjective, their scope is generally objectively defined (via associated rules) and can thus be evaluated ex-post through specific performance indicators (e.g. KPIs), based on metrics of efficacy and efficiency.

¹⁰ Weber (1920) specifically states that “management by written documents” in bureaucratic organisations is important to separate the bureau from the official’s private domicile. (Weber, 1920a)

2. Extitutions

Basic constituents: Extitutions are defined by *identities*¹¹ and *relationships*. Identities represent the extitutional embodiment of the institutional role description of an individual. Relationships between identities are not determined *ex-ante*, as in the case of institutional roles and rules, but rather emerge organically, as a result of repeated interactions (Lazega, 2020)—and are constantly evolving over time, with every new interaction, or lack thereof. These relationships are a complex combination of *social interdependencies* and *relational scaffoldings* (Lazega, 2020): a *relational infrastructure* that informs individual interactions. Relationships vary in terms of quality and intensity. The nature of a relationship depends on the amount and the type of these interactions, as well as the medium (or context) in which these interactions take place. Individual relationships within the extitution determine the extent to which and the manner in which individuals can participate in the activities of the extitutions: those who are the most intensively or qualitatively connected will bear more influence than those that are at the margin.

Creation: As opposed to institutions which can be established in a declarative manner, extitutions can only be created in a **constitutive** manner. An extitution is a **relational infrastructure** that *emerges* through a process of experiential induction and mutual recognition by a set of individuals that collectively agree (either implicitly or explicitly) to identify themselves as a group, and to act as a group—therefore enabling others to recognize them as such. Hence, in contrast to institutions, which subsist in the institutional fabric of society, an extitution is a cognitive entity that is not declared or codified in an exogenous fashion, but is recorded endogenously in the mind of all actors involved within it, thereby guiding and affecting their behaviour as a collective.

Memory: An extitution perpetuates through a dual process of reconstitutive downward and upward causation (Hodgson, 2006). On the one hand, the extitution influences individual habits of thought and action (Dewey, 1922; Kilpinen, 2000). Such habits are recorded within the individuals; they manifest themselves as dispositions to engage in previously adopted or acquired behavior or thoughts, given a particular context or stimulus (Hodgson, 2006). On the other hand, these habits also facilitate the collective synchronisation process that reinforces the extitution as a shared cognitive entity (Hodgson & Knudsen, 2004). Accordingly, habits are both shaped by the extitutional fabric and are, in turn, responsible for reinforcing or influencing it.

¹¹ *Identity* is a multi-faceted concept. In psychology, it refers to a psychological concept that encompasses personal attributes, such as the personality traits of a person, its values, beliefs and convictions; but that nonetheless remain distinct from the notion of the “self” (Strohmingier et al., 2017). In sociology, it includes the culture, history, religion and tradition that an individual identifies him or her-self as (Côté, 1996). In this paper, we use “identity” to refer to the constructed image of the self that an individual either directly identifies with, or indirectly has been associated with by third parties, as a result of its affiliation to a particular culture or subculture. As such, the identity does not represent the individual person, but rather its representation in the cognitive space of social relations.

Enforcement: Relationships between individuals create expectations as to how an individual may behave with respect to another individual or the community at large. These expectations can give rise to the establishment of shared norms and collective responsibilities, which are enforced through a more or less coordinated process of peer influence. Indeed, given that there is no predefined entity responsible for such enforcement (and thus no guarantee of enforcement), it can only be exerted in a distributed manner by any of the actors involved in the extitution, in proportion to their realm of influence within the group.

Scaffold: An extitution depends upon and directly contributes to shaping the culture of a social group. Culture consists of shared beliefs, values and norms held by a social group, which shape individuals' perceptions and behaviors, helping them make sense of, stabilize, or destabilize existing structures (Lazega, 2020). The extitution constantly influences its own culture by strengthening, weakening, or modifying it in an on-going process of upward and downward causation (Granovetter, 1985; Hodgson, 2006). It is important not to confuse the culture of an extitution with the extitution itself. The culture is the environmental context in which the extitution operates, acting as both an enabler and as a constraint to its operations. In other words, *culture is to the extitution what structure is to the institution.*

Metabolism: Exstitutions promote cooperation amongst a group by reinforcing the relationships of trust within that group (Govier, 1997; Granovetter, 1985). Trust is defined as the belief by one party (the *trustor*) that another party (the *trustee*) will act in such a way as to further the trustor's interests, even where the trustor is unable to monitor or enforce such a course of action (Gambetta, 1988).¹² As such, trust enables individuals to rely on each other, even in situations of uncertainty, because it reduces the sense of risk and vulnerability inherent in every relationship of (inter)dependence (Luhmann, 2000), while increasing the perceived probability of having individual expectations met. Hence, trust facilitates cooperation within a group by fostering a shared belief that others will act in the best interest of the group.¹³

Evaluation criteria: The successful operation of an extitution is determined by the strength and cohesion of its social fabric, which cannot be assessed via objective metrics or KPIs. Exstitutions must be evaluated via subjective indicators, such as culture, trust, sense of belonging, individual participation, harmony,

¹² For Gambetta (1998), trust is the “subjective probability with which one agent assesses that another agent [...] will perform a particular action [...] independently of his capacity to monitor it, in a context that affects his own action.”

¹³ The role of trust for cooperation is analysed by (Granovetter, 1985) looking at how “ *individuals in a burning theater panic and stampede to the door.*” While this might be seen as “*prototypically irrational behavior, [...] each stampeder is actually being quite rational given the absence of a guarantee that anyone else will walk out calmly, even though all would be better off if everyone did so.*” He notes, however, that in the case of burning houses “*we never hear that [...] family members trampled one another. In the family, there is no Prisoner's Dilemma because each is confident that the others can be counted on.*”

self-actualization, or other metrics of enhanced human potential (Maslow, 1943). Negative indicators include peer pressure, group-thinking, undue influence, abuse of power, manipulation, etc.

III. Interplay between Institutions and Extitutions

As illustrated above, social interactions do not operate in a vacuum; they are shaped by a multiplicity of social bonds and cultural forces, and by a series of endogenous or exogenous influences that determine an individual's freedom of action. It is only by analysing both the *institutional structure*, characterized by codified rules and roles, and the *extitutional culture*, characterized by the *relational infrastructure* of a particular social group, that it becomes possible to understand the multiplicity of interactions at play within that group. Together, these forces contribute to shaping the environment in which individuals can express their *agency*—defined as the set of actions informed from the recognition, mobilization and combination of both the culture and the structure of a social group (Lazega, 2020).

Institutions and extitutions are in a process of constant interaction and co-determination. The roles and rules of an institution evolve as a result of extitutional forces that require or encourage the institution to modify its own structural components to better accommodate, support, or—conversely—counteract some of these external dynamics. At the same time, the relational infrastructure of an extitution is constantly affected by the institutional rules and roles that directly or indirectly affect the individuals concerned. It is through a process of constant negotiation between institutional and extitutional dynamics that social structures establish and constantly reformulate their stable equilibrium (Hodgson, 2006). We analyze below the interplay between institutional and extitutional dynamics, with a view to better understand how their combined forces affect individual agency.

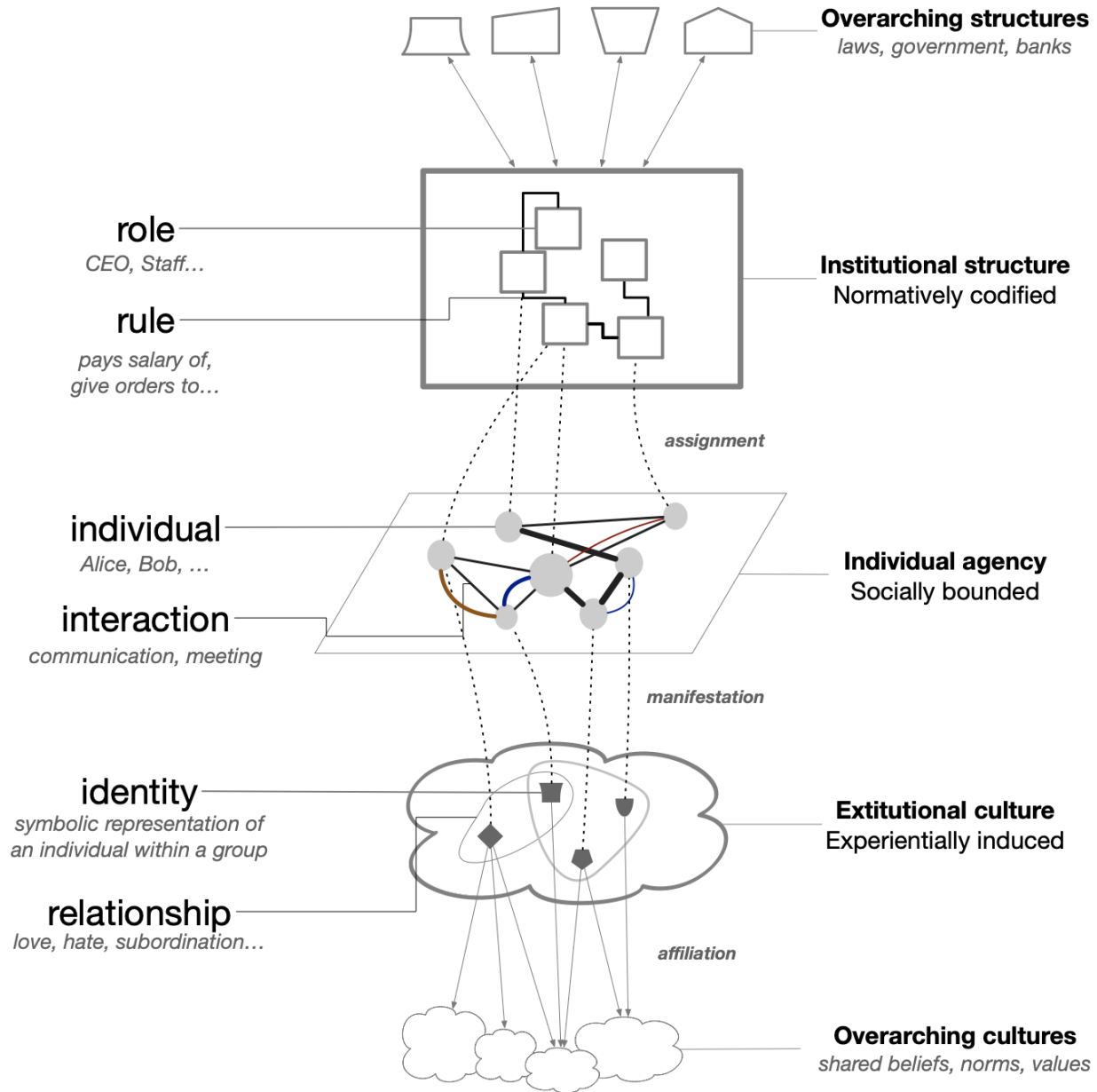


Figure 1. Social structures as interdependent, multi-level institutional and extitutional networks. Schematic representation of the interplay between social dynamics, institutional structures and extitutional cultures. Individuals are linked through multiple types of interactions (link colors) represented by a multiplex network, and associated with a variety of *roles* (related to specific rules) and *identities* (which belong to specific subcultures). Roles and rules constitute the normatively codified “institutional structure”, while identities and the relationships that emerge from and contain them (see Figure 2) constitute the experientially induced “extitutional culture”.

1. Institutions affecting extitutions

Institutions are designed as a framework to support, guide, influence, limit or constrain social dynamics, by shaping the extitutions that influence them. There are three different levers available to institutions to affect and account for the underlying extitutional dynamics: changing roles, changing rules, and/or changing the individuals associated with existing roles.

First, institutions can influence the operations of an extitution, by creating roles or rules that will modify the nature or intensity of specific relationships, generating new expectations that will potentially affect extitutional dynamics. For instance, an institution with strong rules against sexual harassment can contribute to both maintaining a safe space within the work environment, and discouraging the expression or establishment of intimate relationships between individuals. Second, institutions can generate new or support existing relationships to promote or reinforce specific extitutional dynamics. For instance, an institution might decide to establish a policy requiring people to come to the office during working hours, in order to encourage individuals to meet and network. Finally, institutions can establish rules or roles intended to mitigate the impact or prevent the emergence of undesirable extitutional dynamics. For instance, institutions often implement a formalized separation of powers to avoid abuse of dominant position by overly influential actors, transparency requirements to avoid corruption, etc.

2. Extitutions affecting institutions

In turn, the extitutional fabric of a social group can also impact its institutional scaffold. Most of the time, the activities of an extitution occur outside the institutional ruleset, and are therefore unlikely to modify the institutional structure. For example, the act of taking a coffee with a colleague does not impact nor depart from the institutional rules of a company. However, in some cases, extitutional activities might either explicitly violate institutional rules, and therefore push towards the *degeneration* of these rules (e.g. if employees always arrive late at work, the institution might delay the starting time of meetings), or they will push towards the *generation* of a new rule if they do not violate any existing institutional rule (e.g. if too many employees smoke inside the facilities even if it's not forbidden, it might trigger the establishment of a new rule against smoking). As a result, extitutions might impact the structure of an institution in three different ways:

First, some extitutional dynamics might lead to a change in the roles assigned to specific individuals. For instance, the emergence of strong relationships between individuals might lead to “nepotism”, where certain types of relationships promote privileged access to a particular role, or “discrimination”, where other types of relationships prevents access to that role.

Second, strong and repeated extitutional dynamics will eventually be recognized by the institution, which may adapt to accommodate these dynamics through the establishment of new rules or roles. This includes changing a company's organigram, shifting people's roles, or introducing new rules to endorse extitutional rituals. At the same time, undesirable extitutional dynamics might also trigger a process of further institutionalisation in order to prevent or reduce the force of these dynamics. For instance, to mitigate nepotism, an institution might introduce a 'hiring committee' replacing the single HR person.

Finally, some extitutional dynamics might influence the extent to which existing roles and rules will be enforced. For example, by establishing a good relation with an influential individual within a group, one might expect more lenience on the enforcement of the rules and roles attributed to that individual.

IV. Formalization of the proposed theoretical framework

Network analyses can help identify relational infrastructures to better understand collective agency among peers (Lazega, 2001). As pointed out by Lazega (2020), coupling group-level interactions (at the institutional or extitutional level) with individual relationships in the study of organized collective action requires using **multiplex** and **multilevel** network analyses. In addition, Lazega (2020) distinguishes between the *ex-ante* normative nature of impersonal (institutional) structures, and the *ex-post* inductive nature of personalized (extitutional) relationships:

“Networks of impersonal interactions are often analyzed by identifying predefined groups of members based on ex ante attributes derived from formal hierarchy or division of work and working on their global attitudes towards each other. Networks of personalized relationships tend to start with inductively defined clusters of members based on a combination of dyadic, triadic and higher-order relational substructures, until the analysis reaches relational infrastructures at the morphological level (based on cohesion or on structural equivalence as defined in particular by White, Boorman, & Breiger, 1976 – that is, by emergent similarities between relational profiles of actors), which are then ex post interpreted in terms of attributes.” (Lazega, 2020)

Following these insights, we formalize the interplay between institutions and extitutions as a means to understand the social dynamics within a social group (Figure 1). In this framework, we first identify a particular group of individuals and their interactions, which constitute the network of observable social dynamics (*middle layer*). The institutional structure (*upper layer*) and extitutional culture (*lower layer*) are two **cognitive representations** that simultaneously stem from and impact these social dynamics.

The **institutional layer** comprises roles, associated to individuals, and rules dictating the interaction between these individuals. It is not a perfect representation of actual social dynamics (*i.e.* individual interactions), but rather a codification of behaviour through the establishment of a particular set of affordances and constraints which are intended to affect social dynamics within the social group. The

extitutional layer comprises identities (*i.e.* symbolic representations of individuals within a group) and their relationships, embedded within the experientially induced culture of the extitution. It constitutes the relational infrastructure of the social group, supporting certain types of interactions amongst individuals by virtue of shared mental models and cultural affiliations. Yet, just like the institutional layer, the extitutional layer is not a direct description of individual interactions, but rather a symbolic representation of a particular set of relationships that are cognitively established and assessed, in an on-going manner, by all the individuals involved in the social group. ***As such, both the institutional and extitutional layer are not merely descriptive models, they also have a normative and performative function.***

This multi-layered representation provides a series of advantages to study the institutional and extitutional forces responsible for the evolution of social dynamics within a group. These are, *inter alia*: (1) a **new vocabulary** to describe the underlying forces underpinning the establishment and evolution of social dynamics beyond the individual and institutional level; (2) a disentangled yet tightly coupled representation of social dynamics, relying on a **multi-layer network formalization** that renders more explicit the interplay between the institutional structure and extitutional culture of a social group (Figure 1 and 2); (3) a **dynamic modeling of institution evolution**, accounting for the continuous feedback loop manifested in the upward and downward causation occurring within a particular relational infrastructure (Figure 3).

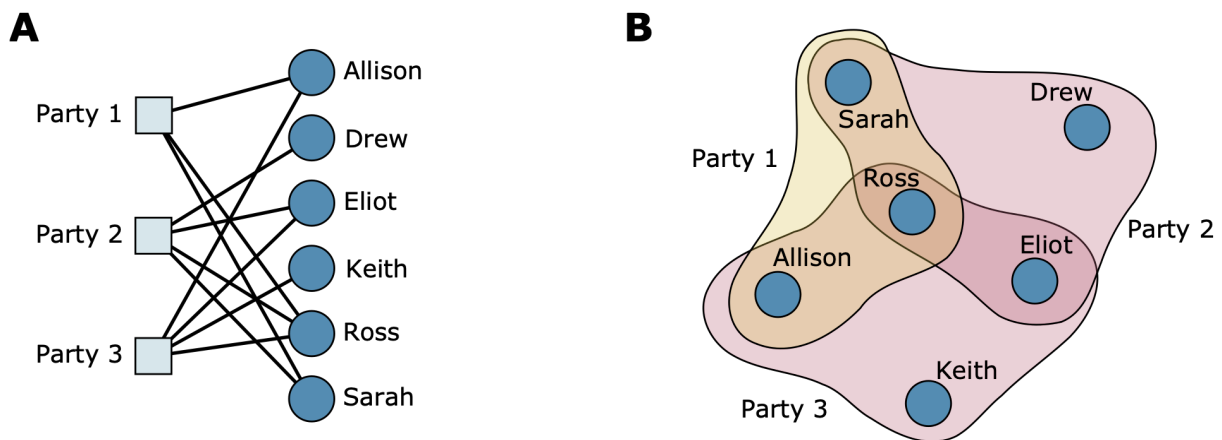


Figure 2. Projection of (institutional and/or extitutional) cognitive layers onto individual relationships.

Representation of an actor-event network (left) as a hypergraph (right), taken from (Battiston et al., 2020). In our case, the event layer consists of extitutional identities (beliefs, norms, values,...) to which individuals (un)consciously identify with, or to institutionally codified roles that individuals are assigned with. The hypergraph representation explicitly identifies overlapping clusters of members that constitute the relational infrastructures at the morphological level. In a reconstitutive process of upward and downward causation, they reinforce and are reinforced by individual interactions, for example through habits and conventions (Hodgson & Knudsen, 2004).

With regard to the former, the extitutional framework encompasses a broad variety of concepts and notions from multiple disciplines, including sociology, anthropology, psychology, cognitive sciences, business management, etc. We aim to bring these different conceptualisations together under a unique and comprehensive theoretical framework aimed towards the formalization of the relational infrastructure underpinning structured social interactions. By decoupling and distinguishing the driving forces associated with institutional structure from those associated with the more relational and cultural aspects of social dynamics, it becomes possible to more explicitly focus on one rather than the other. We hope that the focus on the extitutional lens will foster more research and data collection to support the analysis of extitutional dynamics underpinning social interactions. In line with the recent developments in the field of neo-structural sociology (Lazega, 2020),

“The difference between bureaucracy and collegiality is important for a sociological understanding of interactional and relational infrastructures that are necessary for organized collective action and management of this cooperation. To capture the difference between the two ideal types requires developing the toolkit of organizational sociology – in particular, multilevel social network analysis focusing on networks of impersonal interactions in bureaucracy and networks of personalized relationships in collegiality, and the socially organized mix of both. It should be acknowledged from the outset that our knowledge of this mix is rather sketchy and a matter for further research”

With regard to the modeling framework, disentangling the institutional and extitutional dynamics of social groups enables us to engage into a deeper analysis of the interplay between institutional and extitutional forces, as the driver of social organisations (Figure 3). Moreover, such a dual framework is useful to the extent that it enables us to describe, understand, and guide the evolution of social dynamics, by manipulating layer-specific variables. For instance, it makes it possible to investigate the consequences of institutional changes on the extitutional fabric (or vice versa), by separating the repercussions derived from changes in the institutional structure (e.g. modification of a role or rule) with changes related to the personalised relationships (e.g. employee’s turnover).

With regard to the latter, adopting a dynamic approach enables us to underline the continuous feedback loop that characterises the evolution of social organisations. While institutions cannot directly affect extitutions, and vice versa, changes in the institutional structure or extitutional culture of a social group will likely influence the social interactions between the individuals in the group, through a process of downward causation (Hodgson, 2006). Over time, these changes in social interactions will likely trigger a restructuring of both the institutional and extitutional layers through a mechanism of upward causation (Figure 3).

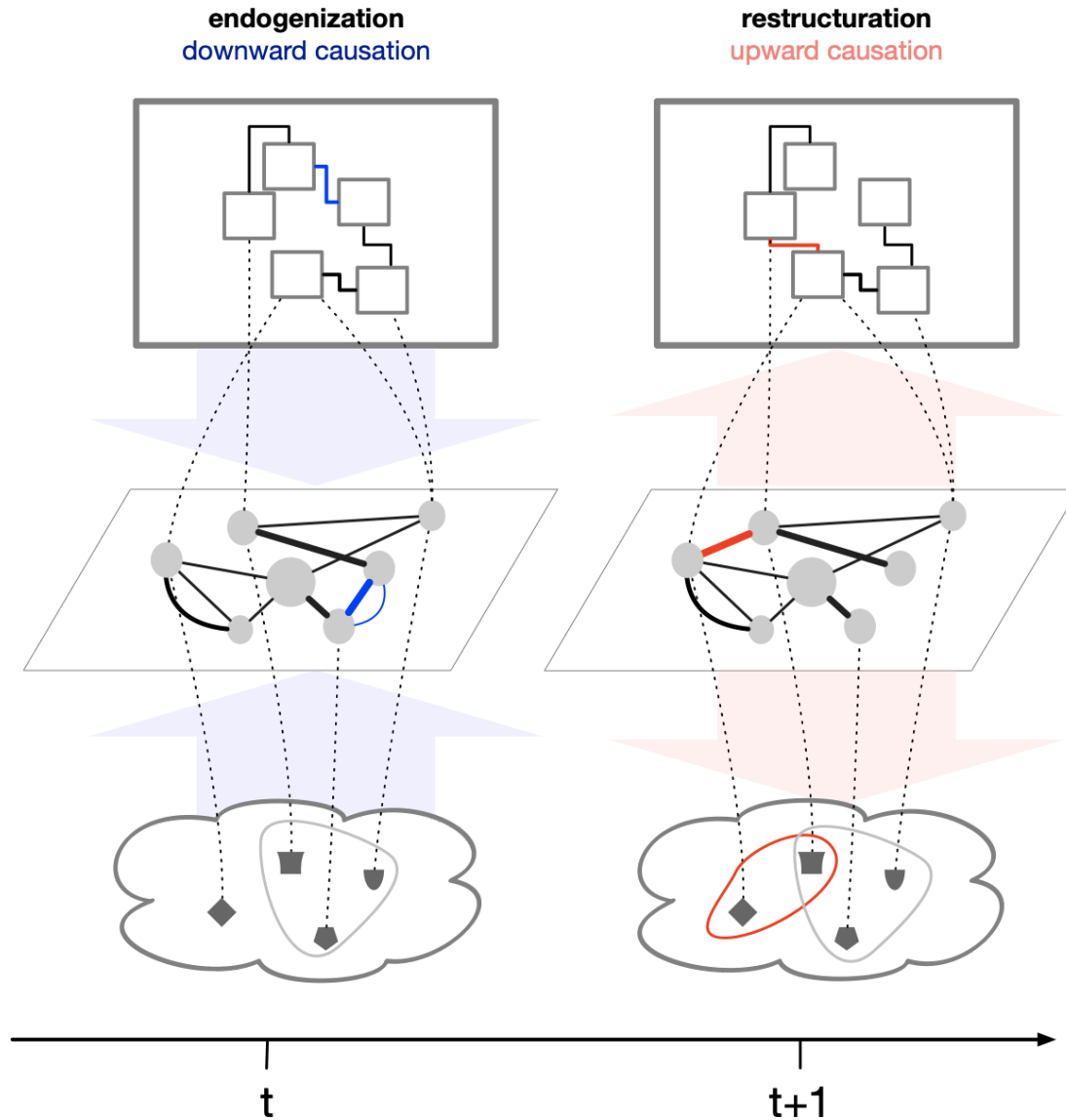


Figure 3. Social structured dynamics through downward and upward causation.

Schematic representation of the *endogenization* process, whereby new social interactions (*blue links*) are triggered by the establishment of new rules within the institutional structure or the emergence of new social relationships at the extitutional layer; and the *restructuring* process, whereby repeated interactions in a social group (*red link*) may generate new rules at the institutional level, and new relationships at the extitutional layer.

V. Conclusion and future perspectives

In his 2010 paper, Spicer introduced the notion of “extitution” as comprising all these elements that exceed, transcend or escape institutions, yet destabilise them nevertheless. He provides the example of the ‘gay’ who challenges the institution of marriage, or the ‘refugee’ who does not fit within the boundaries of any nation state. According to Spicer, institutions seek to capture these extitutional elements, by either trying to confine and domesticate them, or by trying to harness them to further their own institutional interests (Spicer, 2010).

This paper takes a slightly different take, reframing the notion of “extitution” to refer not to a set of elements that exist beyond the institution, and are therefore ‘invisible’ to them, but rather as an alternative lens through which social dynamics can be analysed and understood. Hence, the same social group can be analysed through both an institutional and extitutional lens, depending on the focus of analysis. The institutional lens will put more attention on the roles, the rules, and the overall structure that guide or support specific social dynamics, whereas the extitutional lens will focus more on the relationships that emerge between individuals, and the culture that characterises these social interactions.

Extitutional theory provides an integrated theoretical framework and conceptual toolkit to investigate the interplay that subsists between the institutional and extitutional facets of a same social group, disentangling the two in order to support the analysis of their distinctive characteristics and their corresponding influences on social dynamics. The goal is to define a social structure in a dualistic approach, separating its constitutive elements according to the ordering dynamics that animate them, so as to shed more clarity on the specificities of each and the interactions between the two.

Building upon Hodgson’s definition of “institution” as integrating both rules and habits (Hodgson, 2006), Granovetter’s socio-economic network theory of embeddedness of social actors in market organisations (Granovetter, 1985), and the more recent neo-structural sociology promoting network-based studies of the interplay between bureaucracy and collegiality underlying collective agency (Lazega, 2021), we elaborate a new theoretical framework that formalizes the reciprocal interactions between institutions and extitutions. While Lazega specifically focuses on the sociology of organisations, with less attention given to broader institutions such as language, markets or law; Granovetter focuses essentially on the socio-economic analysis of market dynamics, with no formal attempts at applying his theory in the realm of the firm or other institutional formats. Extitutional theory encompasses both of these learnings and integrates them into a single and comprehensive theoretical framework which can apply generally to any type of structured social dynamics.

The contribution of extititutional theory is principally conceptual and analytical. It provides a new vocabulary and conceptual toolkit that will help put the focus on the extititutional aspects of existing and established institutional structures, in order to better describe and understand their social dynamics. However, extititutional theory also has a prescriptive or normative function, in that it can help us shape these institutions in ways that best accommodate the underlying extititutional dynamics that one wants to promote. The specific contribution of this paper in the context of extititutional theory is to formalise and illustrate the processes of upward and downward causation that exists between institutions and extitutions: on the one hand, the process of institutionalisation enable the formalisation and the crystallisation of specific extititutional dynamics, on the other hand, the process of extititutionalisation creates new habits that ultimately may trigger an evolution of institutional structures.

Extititutional theory remains, however, an emergent field of scholarship, which is still in an embryonic state. More research is necessary in order to further explore the distinctive characteristics of extititutional dynamics and their relationship with institutional forms. In particular, this work can be of interest, and nurtured by insights from a number of adjacent disciplines with similar intents yet different vocabularies. As such, it is important to draw from previous literature from different disciplinary backgrounds (including business management, complex networks, biology, anthropology, etc.) to integrate and ideally reconcile the insights of scholars who have been studying extititutional dynamics in other fields of endeavours.

For example, in the field of economics and political sciences, game theoretical models have been elaborated to map the co-dependence between culture (civic capacity) and institutions (Bednar & Page, 2018). At a smaller, micro-scale, team science as a field has probed social interaction mechanisms and role composition structure that facilitates teamwork (Guimerà et al., 2005; Mukherjee et al., 2019) and enhances collective intelligence (Woolley et al., 2010), with a view to maximize group performance into completing complex collective tasks (Hotelling & Bagrow, 2020; Klug & Bagrow, 2016). Beyond the traditional format of well-defined social groups with predetermined goals, the open-source, open science, or digital communities more generally offer examples of agile, self-organised communities with limited institutionalisation. Examples include participatory open science (Benchoufi et al., 2018; Franzoni & Sauermann, 2014; Landrain et al., 2013; Masselot et al., 2021), collaborative knowledge production on Wikipedia (Klein et al., 2015) and open-source software contributions (Klug & Bagrow, 2016; Sornette et al., 2014), as well as large-scale social media datasets that offer experimental windows into “para-institutions” (Peña-López et al., 2014). On the socio-technological side, network studies of the collective operations underlying large-scale construction projects offer insights into highly institutionalized, predetermined rule-based activity networks and the role of structural properties in the overall performance (Ellinas, 2019; Santolini et al., 2020).

In addition to these empirical studies, network science has also been used to model social dynamics, in order to formalize social dynamics into predictive models. For instance, network science has been used to relate social network structure with complex group problem solving (Barkoczi & Galesic, 2016), as well as to provide multi-level social network insights into the collaborations and reputation systems of researchers within a research institution network (Wang et al., 2013). Beyond human systems, ecological models have provided an established toolkit to describe the stability, vulnerability, and dynamics of animal ecosystems using network approaches (Flack, 2012; Suweis et al., 2013) with applications in collective problem solving (Flack, 2013) as well as the structural evolution of firm networks (Saavedra et al., 2009).

Overall, the field of extitutional theory attempts to collect insights from all of these disciplines and integrate into a common encompassing theoretical framework. Future work is needed to validate this framework by means of empirical research and case studies. This includes mapping the lifecycle of social structures, and their evolution from mere informal groups to early extitutions, more formalised institutions, and eventually to full-fledged bureaucratic organisations. Future work should also address the possible drift of extitutions, when not properly constrained by institutional scaffoldings, and their evolution into excessively homogeneous groups or cults dominated by a few powerful or charismatic individuals. Eventually, strategies could be developed to combine institutional structures and institutional elements within a social group in order to support and promote desirable social dynamics, while limiting undesirable ones, with significant consequences for organizational design and governance.

Acknowledgements

This work benefited from multiple insights and discussions during the extitutional workshops held at the Feÿ Extitute of Research. We thank in particular Jessy Kate Schingler, Tony Lai, Anika Saigal, and Fatemeh Fannizadeh for significant contributions in early stages of the formulation of the framework. We also thank Alejandro Alviles, Noé Curtz, Enric Senabre Hidalgo, Olivier Irrman, Matthieu Leventis, Eric Alston, Larry Backer and Robert Ward for their comments and suggestions. We are especially grateful to the Feÿ Extitute of Research for supporting our work, both at the intellectual and operational level. Thanks to the Bettencourt Schueller Foundation long term partnership, this work was partly supported by the CRI Research Fellowship to Marc Santolini.

References

- Alesina, A., & Giuliano, P. (2015). Culture and Institutions. *Journal of Economic Literature*, 53(4), 898–944. <https://doi.org/10.1257/jel.53.4.898>
- Alexander, E. R. (2005). Institutional Transformation and Planning: From Institutionalization Theory to Institutional Design. *Planning Theory*, 4(3), 209–223. <https://doi.org/10.1177/1473095205058494>
- Andersen, N. Å. (2001). *Polyphonic Organisations* (Working Paper No. 13/2001). Copenhagen Business School, Department of Management, Politics & Philosophy. https://econpapers.repec.org/paper/hhbcbslpf/2001_5f013.htm
- Andersen, N. Å., & Born, A. W. (2007). Heterophony and the Postponed Organization Organizing autopoietic systems. *Tamara: Journal for Critical Organization Inquiry*, 6(2), Article 2. <https://tamarajournal.com/index.php/tamara/article/view/90>
- Aoki, M. (2001). *Toward a Comparative Institutional Analysis*. MIT Press.
- Barkoczi, D., & Galesic, M. (2016). Social learning strategies modify the effect of network structure on group performance. *Nature Communications*, 7(1), 13109. <https://doi.org/10.1038/ncomms13109>
- Battiston, F., Cencetti, G., Iacopini, I., Latora, V., Lucas, M., Patania, A., Young, J.-G., & Petri, G. (2020). Networks beyond pairwise interactions: Structure and dynamics. *Physics Reports*, 874, 1–92. <https://doi.org/10.1016/j.physrep.2020.05.004>
- Bednar, J., & Page, S. E. (2018). When Order Affects Performance: Culture, Behavioral Spillovers, and Institutional Path Dependence. *American Political Science Review*, 112(1), 82–98. <https://doi.org/10.1017/S0003055417000466>
- Benchoufi, M., Fournier, M., Magrez, D., Macaux, G., Barué, V., Mansilla Sanchez, A., de Fresnoye, O., Fillaudeau, R., Tauvel-Mocquet, O., Chalabi, N., Petit-Nivard, J. F., Blondel, L., Santolini, M., & Ben Hadj Yahia, B. (2018). Epidemium: A multidisciplinary

- community to tackle cancer using big and open data. *Journal of Clinical Oncology*, 36(15_suppl), e13604–e13604. https://doi.org/10.1200/JCO.2018.36.15_suppl.e13604
- Bennett, J. W. (1996). *Human Ecology As Human Behavior: Essays in Environmental and Development Anthropology*. Transaction Publishers.
- Billig, M. S. (2000). Institutions and Culture: Neo-Weberian Economic Anthropology. *Journal of Economic Issues*, 34(4), 771–788.
- Bowles, S. (2004). *Microeconomics: Behavior, Institutions, and Evolution*. Princeton University Press. <https://doi.org/10.2307/j.ctvcm4gc3>
- Bowles, S., Choi, J.-K., & Hopfensitz, A. (2003). The co-evolution of individual behaviors and social institutions. *Journal of Theoretical Biology*, 223(2), 135–147. [https://doi.org/10.1016/S0022-5193\(03\)00060-2](https://doi.org/10.1016/S0022-5193(03)00060-2)
- Burt, R. (1982). *Toward a Structural Theory of Action: Network Models of Social Structure, Perception, and Action*. Academic Press.
- Côté, J. (1996). Sociological perspectives on identity formation: The culture-identity link and identity capital. *Journal of Adolescence*, 19(5), 417–428. <https://doi.org/10.1006/jado.1996.0040>
- Crawford, S. E. S., & Ostrom, E. (1995). A Grammar of Institutions. *The American Political Science Review*, 89(3), 582–600. <https://doi.org/10.2307/2082975>
- Dal Bó, P., Foster, A., & Putterman, L. (2010). Institutions and Behavior: Experimental Evidence on the Effects of Democracy. *American Economic Review*, 100(5), 2205–2229. <https://doi.org/10.1257/aer.100.5.2205>
- Dewey, J. (1922). *Human nature and conduct: An introduction to social psychology* (pp. vii, 336). Henry Holt and Company. <https://doi.org/10.1037/14663-000>
- Duesenberry, J. (1960). Comment on “An Economic Analysis of Fertility.” In *Demographic and Economic Change in Developed Countries* (Universities-National Bureau Committee for Economic Research). Princeton University Press.

- Ellinas, C. (2019). The Domino Effect: An Empirical Exposition of Systemic Risk Across Project Networks. *Production and Operations Management*, 28(1), 63–81.
<https://doi.org/10.1111/poms.12890>
- Flack, J. C. (2012). Multiple time-scales and the developmental dynamics of social systems. *Philosophical Transactions of the Royal Society B: Biological Sciences*, 367(1597), 1802–1810. <https://doi.org/10.1098/rstb.2011.0214>
- Flack, J. C. (2013). Animal Communication: Hidden Complexity. *Current Biology*, 23(21), R967–R969. <https://doi.org/10.1016/j.cub.2013.10.001>
- Foster, J. F. (1981). The Effect of Technology on Institutions. *Journal of Economic Issues*, 15(4), 907–913.
- Franzoni, C., & Sauermann, H. (2014). Crowd science: The organization of scientific research in open collaborative projects. *Research Policy*, 43(1), 1–20.
<https://doi.org/10.1016/j.respol.2013.07.005>
- Gambetta, D. (1988). Can We Trust Trust? *Trust: Making and Breaking Cooperative Relations*, 213–237.
- Govier, T. (1997). *Social Trust and Human Communities*. McGill-Queen's University Press.
<https://www.jstor.org/stable/j.ctt80j09>
- Granovetter, M. (1985). Economic Action and Social Structure: The Problem of Embeddedness. *American Journal of Sociology*, 91(3), 481–510.
- Griffin, R. W., & Moorhead, G. (2011). *Organizational Behavior*. Cengage Learning.
- Guimerà, R., Uzzi, B., Spiro, J., & Amaral, L. A. N. (2005). Team Assembly Mechanisms Determine Collaboration Network Structure and Team Performance. *Science*, 308(5722), 697–702. <https://doi.org/10.1126/science.1106340>
- Guiso, L., Sapienza, P., & Zingales, L. (2015). Corporate Culture, Societal Culture, and Institutions. *American Economic Review*, 105(5), 336–339.
<https://doi.org/10.1257/aer.p20151074>

- Hamilton, W. (1932). Institution. In *Encyclopedia of the Social Sciences* (Vol. 8, pp. 84–89). Macmillan. <http://archive.org/details/Hamilton1932Institution>
- Hodgson, G. M. (2006). What Are Institutions? *Journal of Economic Issues*, 40(1), 1–25. <https://doi.org/10.1080/00213624.2006.11506879>
- Hodgson, G. M., & Knudsen, T. (2004). *The Complex Evolution of a Simple Traffic Convention: The Functions and Implications of Habit*. <https://doi.org/10.1016/J.JEBO.2003.04.001>
- Hofstede, G. (2001). Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations. *Culture's Consequences: Comparing Values, Behaviors, Institutions, and Organizations Across Nations*. https://digitalcommons.usu.edu/unf_research/53
- Jackman, R. W., & Miller, R. A. (2004). *Before Norms: Institutions and Civic Culture*. University of Michigan Press. <https://doi.org/10.3998/mpub.17553>
- Kilpinen, E. (2000). *The Enormous Fly-Wheel of Society: Pragmatism's Habitual Conception of Action and Social Theory*. <https://helda.helsinki.fi/handle/10138/10587>
- Kingston, C., & Caballero, G. (2009). Comparing theories of institutional change. *Journal of Institutional Economics*, 5(2), 151–180. <https://doi.org/10.1017/S1744137409001283>
- Klein, M., Maillart, T., & Chuang, J. (2015). The Virtuous Circle of Wikipedia: Recursive Measures of Collaboration Structures. *Proceedings of the 18th ACM Conference on Computer Supported Cooperative Work & Social Computing*, 1106–1115. <https://doi.org/10.1145/2675133.2675286>
- Klug, M., & Bagrow, J. P. (2016). Understanding the group dynamics and success of teams. *Royal Society Open Science*, 3(4), 160007. <https://doi.org/10.1098/rsos.160007>
- Knight, J. (1992). *Institutions and Social Conflict*. Cambridge University Press. <https://doi.org/10.1017/CBO9780511528170>
- Laloux, F. (2014). *Reinventing Organizations: A Guide to Creating Organizations Inspired by the Next Stage of Human Consciousness*.

- Landrain, T., Meyer, M., Perez, A. M., & Sussan, R. (2013). Do-it-yourself biology: Challenges and promises for an open science and technology movement. *Systems and Synthetic Biology*, 7(3), 115–126. <https://doi.org/10.1007/s11693-013-9116-4>
- Lawson, T. (2003). Institutionalism: On the Need to Firm up Notions of Social Structure and the Human Subject. *Journal of Economic Issues*, 37(1), 175–207. <https://doi.org/10.1080/00213624.2003.11506562>
- Lazega, E. (1992). *Micropolitics of Knowledge. Communication and Indirect Control in Workgroups*. Aldine Transaction. <https://hal.archives-ouvertes.fr/hal-01800260>
- Lazega, E. (2001). *Collegial Phenomenon: The Social Mechanisms of Cooperation Among Peers in a Corporate Law Partnership Introduction*. 346.
- Lazega, E. (2020). *Bureaucracy, Collegiality and Social Change: Redefining Organizations with Multilevel Relational Infrastructures*. Edward Elgar Publishing.
- Lazega, E. (2021). Networks and Neo-Structural Sociology. In R. Light & J. Moody (Eds.), *The Oxford Handbook of Social Networks* (pp. 49–70). Oxford University Press. <https://doi.org/10.1093/oxfordhb/9780190251765.013.8>
- Lewis, O. A., & Steinmo, S. (2012). How Institutions Evolve: Evolutionary Theory and Institutional Change. *Polity*, 44(3), 314–339. <https://doi.org/10.1057/pol.2012.10>
- Lincoln, J. (1982). Intra- (and Inter-) Organizational Networks. In *Research in the Sociology of Organization* (S. Bacharach, Vol. 1, pp. 1–38).
- Luhmann, N. (2000). *Familiarity, Confidence, Trust: Problems and Alternatives*.
- Maslow, A. H. (1943). A theory of human motivation. *Psychological Review*, 50(4), 370–396. <https://doi.org/10.1037/h0054346>
- Masselot, C. M., Greshake Tzovaras, B., Graham, C. L. B., Jeyaram, R., Finnegan, G., Vitali, I., Landrain, T. E., & Santolini, M. (2021). Co-Immune: A case study on open innovation for vaccination hesitancy and access. *MedRxiv*, 2021.03.29.20248781. <https://doi.org/10.1101/2021.03.29.20248781>

- Mukherjee, S., Huang, Y., Neidhardt, J., Uzzi, B., & Contractor, N. (2019). Prior shared success predicts victory in team competitions. *Nature Human Behaviour*, 3(1), 74–81.
<https://doi.org/10.1038/s41562-018-0460-y>
- Nau, H. H. (2005). Institutional, evolutionary and cultural aspects in Max Weber's social economics. *Cahiers d'économie Politique*, n° 49(2), 127–142.
- Newstrom, J. W., Davis, K., & Davis, K. (1993). *Organizational behavior: Human behavior at work* (9th ed). McGraw-Hill.
- Peña-López, I., Congosto, M., & Aragón, P. (2014). Spanish Indignados and the evolution of the 15M movement on Twitter: Towards networked para-institutions. *Journal of Spanish Cultural Studies*, 15(1–2), 189–216. <https://doi.org/10.1080/14636204.2014.931678>
- Polanyi, K. (1944). *The great transformation: The political and economic origins of our time*. Beacon Press.
- Potts, J. (2007). Evolutionary Institutional Economics. *Journal of Economic Issues*, 41(2), 341–350. <https://doi.org/10.1080/00213624.2007.11507020>
- Robbins, S. P., & Judge, T. A. (2015). *Essentials of Organizational Behavior, Student Value Edition* (13th edition). Pearson.
- Saavedra, S., Reed-Tsochas, F., & Uzzi, B. (2009). A simple model of bipartite cooperation for ecological and organizational networks. *Nature*, 457(7228), 463–466.
<https://doi.org/10.1038/nature07532>
- Santolini, M., Ellinas, C., & Nicolaidis, C. (2020). Uncovering the fragility of large-scale engineering project networks. *ArXiv:2009.11752 [Physics]*.
<http://arxiv.org/abs/2009.11752>
- Sornette, D., Maillart, T., & Ghezzi, G. (2014). How Much Is the Whole Really More than the Sum of Its Parts? $1 \boxplus 1 = 2.5$: Superlinear Productivity in Collective Group Actions. *PLOS ONE*, 9(8), e103023. <https://doi.org/10.1371/journal.pone.0103023>
- Spicer, A. (2010). *Extitutions: The other side of institutions*. 15.

- Strohminger, N., Knobe, J., & Newman, G. (2017). The True Self: A Psychological Concept Distinct From the Self. *Perspectives on Psychological Science*, 12(4), 551–560.
<https://doi.org/10.1177/1745691616689495>
- Suweis, S., Simini, F., Banavar, J. R., & Maritan, A. (2013). Emergence of structural and dynamical properties of ecological mutualistic networks. *Nature*, 500(7463), 449–452.
<https://doi.org/10.1038/nature12438>
- Tabellini, G. (2008). Institutions and Culture. *Journal of the European Economic Association*, 6(2–3), 255–294. <https://doi.org/10.1162/JEEA.2008.6.2-3.255>
- Tabellini, G. (2010). Culture and institutions: Economic development in the regions of Europe. *Journal of the European Economic Association*, 8(4), 677–716.
- Wang, P., Robins, G., Pattison, P., & Lazega, E. (2013). Exponential random graph models for multilevel networks. *Social Networks*, 35(1), 96–115.
<https://doi.org/10.1016/j.socnet.2013.01.004>
- Weber, M. (1910). Diskussionsrede zu dem Vortrag von A. Ploetz über “Die Begriffe Rasse und Gesellschaft.” In *Gesammelte Aufsätze zur Soziologie und Sozialpolitik* (M. Weber, pp. 456–462).
- Weber, M. (1920a). *Economy and Society: An Outline of Interpretive Sociology*. University of California Press.
- Weber, M. (1920b). *Weber: Political Writings (Cambridge Texts in the History of Political Thought)* (P. Lassman, Ed.; R. Speirs, Trans.; Peter Lassman).
- Woolley, A. W., Chabris, C. F., Pentland, A., Hashmi, N., & Malone, T. W. (2010). Evidence for a Collective Intelligence Factor in the Performance of Human Groups. *Science*, 330(6004), 686–688. <https://doi.org/10.1126/science.1193147>
- Wright, S. (2004). *Anthropology of Organizations*. Routledge.