



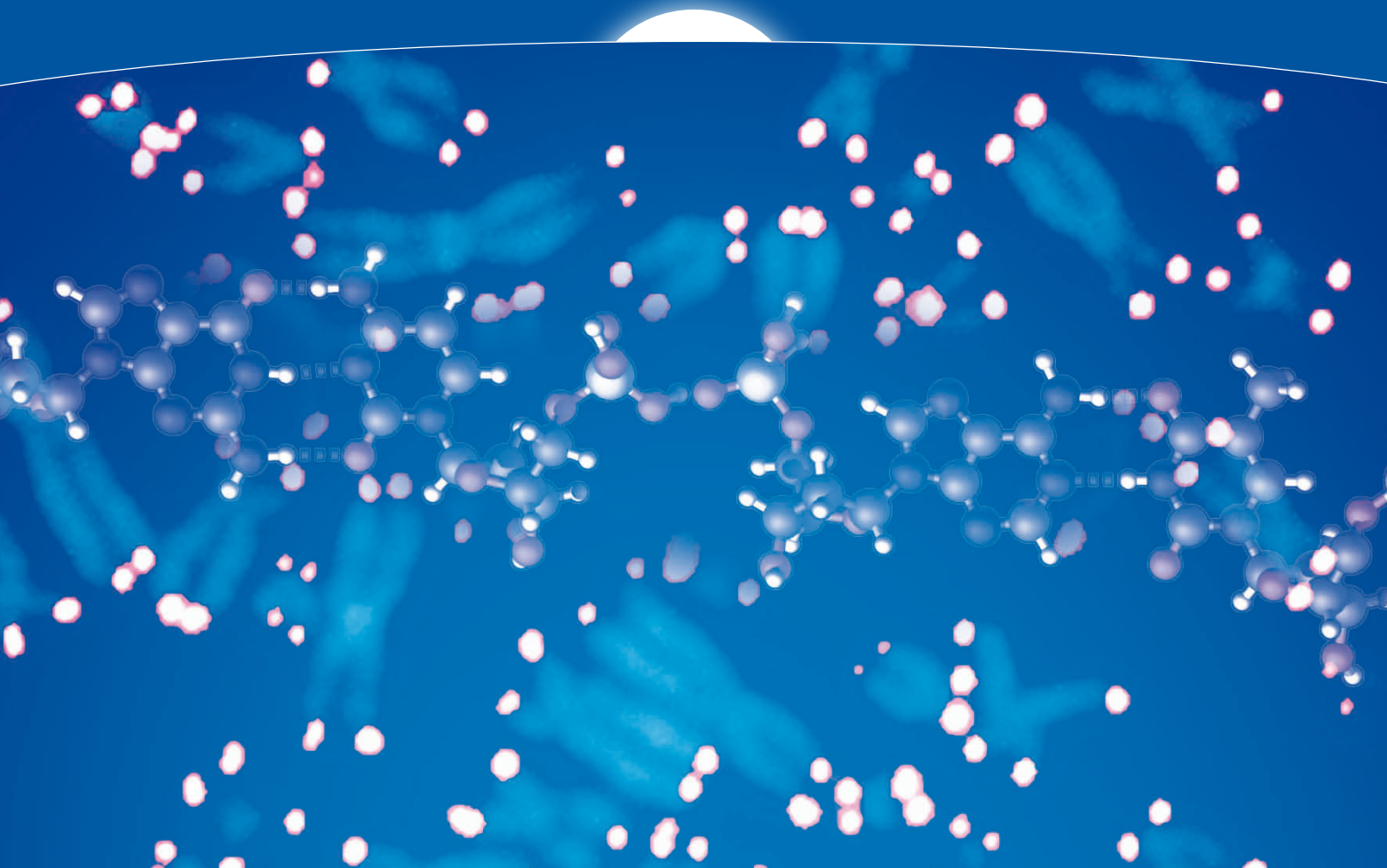
Enel Foundation
Energy for Knowledge

Working Paper 2/2013

Research Project
GENOR

Honey, I shrunk the organization: in search of organizational genetics

Luca SOLARI



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Luca SOLARI ^{1,2,3}

¹ University of Milan, Dept. of Social and Political Sciences

² California Polytechnic State University

³ Enel Foundation

Acknowledgement:

First Working paper of the research project "GENOR", jointly undertaken by University of Milan, University of Pisa, Consorzio Quinn, Ejase and Enel Foundation. Working paper submitted to the "1st Management Theory Conference" (San Francisco, US September 27-29, 2013).

Research Project GENOR

The research project "Genor" investigates those characteristics that make unique an organization and it aims at identifying organizational elements, values and intangible factors, which, due to their persistence and transmissibility, can be defined as "genetic traits" of the organization. These genetic traits are expected to have a long-term impact on strategic and organizational behaviors of a firm, as well as on the capability of adapting to change.

The goal of the project is to pinpoint and measure selected genetic traits of Enel Group. The research make use of different approaches, by using both social-science tools and an innovative methodology of computational semantic analysis of texts.

The project is articulated in two stages: in the first stage different methodologies (literature review, analysis of historical evolution of jobs, competences and shared values, climate survey of Enel Group, semantic analysis of texts) are combined to identify possible genetic traits; the second stage aims at verifying their presence within the Enel Group, using focus group, questionnaires, and interviews and at analyzing the relationship between genetic traits and strategic skills and know-how.

The knowledge of the "genetic traits" of Enel Group will help in understanding how to develop new strategic knowledge, a necessity to respond to changes that are affecting the electricity sector. The results of this research shall provide the basis for the implementation of actions aimed at facilitating the transition of the company towards the future challenges of the market.

Research partners are University of Milan, University of Pisa, Consorzio Quinn, Ejase and Enel Foundation.

This publication is the first working paper of the Genor projects and it presents a review of the existing theories that adopt an analogy to genetics as part of a new field of inquiry, that is denominated in the paper *organizational genetics*.

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Abstract

"What makes an organization unique?" has been a central question for research and practice on competitive advantage. Being unique is associated to the ability to attract and convince customers, investors, and employees, thereby easing the process of collection of resources needed to operate, and augmenting the value of products, services, and opportunities provided.

At the same time, being unique makes it harder for competitors to imitate the organization, and extends the advantage in time. Uniqueness does not come without a less positive side, because it can constrain the organization, which has to maintain continuity with the perceptions of all the different audiences, thereby making radical change harder.

The origins of uniqueness are a central theme for other fields of research, unrelated to management. In psychology, uniqueness lays in the underlying, and unobservable structure of personality. In chemistry and physics, uniqueness of elements is attributed to the very specific structure of their inner components. In evolutionary biology, the common thread is to attribute uniqueness to some characteristic that endows an organism, i.e. genes.

All these metaphors have been explored in management research. However, one of the most fruitful appears to be the analogy with evolutionary biology, which constitutes the leading theme of the overall Genor research project.

This paper provides a literature review of organizational theory from this point of observation. Research in organization theory is characterized by the problem of defining the adequate level of analysis. Different perspectives and theories adopt different levels of analysis, and multi-level theory and research is rather uncommon.

Differently from other areas of scientific inquiry (like for example physics, chemistry, and biology) organization theory has not addressed explicitly the problem of searching for the smallest common unit of analysis. The widespread use of metaphors developed in other scientific domains enriched organization theory with perspectives that explicitly or implicitly affirm the existence of units of analysis beyond the individual. Among them, perspectives related to the biological metaphor play a powerful role.

These perspectives adopt evolutionary mechanisms, consider the interplay between time, inertia, and change, and provide analogies to the concepts of genes (or as more broadly defined by Richard Dawkins, *memes*). The goal of this paper is to look at existing theories that adopt an

analogy to genetics as part of a new field of inquiry that we propose to denominate Organizational genetics. After reviewing how existing theories could be related to this field, we develop an initial theoretical framework that will need to be further developed.

Keywords. organizational genetics, organizational identity, organizational culture, evolutionary organization theory

Jel Codes. L20, M10, M14, L21, L22

Corresponding Author

Luca Solari

University of Milan, Department of Social and Political Sciences

California Polytechnic State University, San Luis Obispo, CA, USA

Enel Foundation, Rome, Italy

Via Conservatorio 7, 20122 Milano - Italy

luca.solari@unimi.it

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1. Introductory remarks

July 4, 2012 marked a milestone in physics, when a press conference at CERN in Geneva revealed the world that physicists had “discovered a new subatomic particle that looks for all the world like the Higgs boson, a key to understanding why there is diversity and life in the universe” (New York Times, July 4, 2012). In biology, the first complete genome sequence of the human mitochondrion, was reported in 1981. Neuroscience is discovering how our brain work and opening up new avenues for research in different fields, from psychology, to medicine to sociology. Science is involved in the search for different, smaller, hidden units of analysis, thanks to the evolution of technology. The importance of finding the smallest unit of analysis is not so much to develop a relationship between micro and macro, but to reveal new and different processes that follow logics and principles so different from the simple cause-effect relations we observe at the macro-level. The results open the road to new applications and treatments, and shatter pre-existing beliefs.

This search for the smallest components of the reality we observe does not appear to affect the field of organizational theory, which appear to be struggling with other profound issues. In fact, while the issue of stronger foundations of organization theory keeps being a concern of scholars (Perrow, 1994; Pfeffer, 1993; Urwick, 1967), the debate on levels of analysis appears limited to a traditional schema that is rooted in the individual, although analyzed through different characteristics, like knowledge, skills, and abilities (Hitt, Beamish, Jackson, & Mathieu, 2007; Perrow, 1994; Dansereau, Yammarino, & Kohles, 1999; Klein, Dansereau, & Hall, 1994). At the same time, theory building faces strong obstacles related to institutional barriers (Suddaby, Hardy, & Huy, 2011).

In an analogy to physics, biology, and neurology it is time to rethink the domain of research and attempt at identifying the smallest unit of analysis of organization theory, avoiding the ambiguity of using the individual as the smallest brick.

Individuals inhabit organizations, shape their processes, enliven them, but they are not a component of the concept of organization (Murmann, Aldrich, Levinthal, & Winter, 2003; Blackmore, 2000). Organizations outlive individuals, maintain their identity through time, show patterns of action that cannot be completely controlled, and develop in time. Research should aim at identifying what makes every organization unique, and when found consider it the smallest unit of analysis. In an analogy to evolutionary biology, where the link between Darwin’s work on

natural selection and Mendel's experiment on blending inheritance originated the modern theory of genetics, I propose to define organizational genetics as this new space for research, and I illustrate how it has already produced relevant results, which lack a consistent framework. Organizational genetics is not a completely new term (Blackmore, 2000), sequencing has been used as a metaphor in organizational routine research (Pentland, Feldman, Becker, & Liu, 2012; Pentland & Rueter, 1994; Abbott, 1990), and as a method in some promising research fields related to organizational theory (Um, Yoo, Berente, & Lyytinen, 2012).

However, we lack a comprehensive framework for organizational genetics, structured as a deliberately new field of organizational research.

2. The architecture of genetics

Wade (2008) provides a description of evolutionary genetics as "the field (that) attempts to account for evolution in terms of changes in gene and genotype frequencies within populations and the processes that convert the variation with populations into more or less permanent variation between species".

The field originated through the "modern synthesis" between Mendelian genetics and Darwinian evolution. According to evolutionary genetics, macro-evolutionary patterns result from the interplay of four evolutionary forces (mutation, random genetic drift, natural selection, and gene flow) that cause micro-evolutionary change. Mutation is the source of variation and occurs at genetic level, usually during reproduction. Random genetic drift is a stochastic process that is responsible for an incomplete transfer of alleles to off-springs, and operates strongly in limited size populations. Natural selection is the only adaptive force to exert pressure on some alleles in relation to their observable consequences (phenotypes). Gene flow and migration are forces that produce divergence in the allele distribution in different and isolated groups of individuals.

Evolutionary genetics emphasizes the importance of stochastic processes and long time horizons in producing variety in biological species. Contrary to adaptation, it de-emphasizes individual action and favors guided randomness. Moreover, evolutionary genetics is anti-deterministic at the macro-level (it is not only the fittest, but also the luckiest to survive) and at the micro-level (the relationship between alleles and phenotypes and the interrelation between different genes are not linear).

The relationship between alleles, genes, individual, kinship groups, groups, populations, species, ecosystems originated different interpretations on where natural selection operates. Maynard Smith (1964) introduced the idea that selection could be best interpreted. "In a radical interpretation of evolutionary genetics" (Dawkins, 2006), evolution is considered as a sort of competition between genes that use phenotypes as vectors to be transferred to the next generation.

Quite interestingly, the roots of evolutionary genetics, are not so much separated from the social sciences if we consider the analysis of the relationship between Darwin and Malthus (Vorzimmer, 1969), and the contribute of the idea of struggle for existence to the Darwinian theory of natural selection. Recently, though, evolutionary researchers are following the reverse path. Dawkins (2006) uses the term meme to refer to any cultural entity that an observer might consider a replicator. Memes generally replicate through exposure to humans, who have evolved as efficient copiers of information and behavior. Because humans do not always copy memes perfectly, and because they may refine, combine or otherwise modify them with other memes to create new memes, they can change over time. Dawkins defined the meme as a unit of cultural transmission, or a unit of imitation and replication, but later definitions would vary. Memes, analogously to genes, vary in their aptitude to replicate; memes which are good at getting themselves copied tend to spread and remain, whereas the less good ones have a higher probability of being ignored and forgotten. Thus "better" memes are selected.

Susan Blackmore (2000) applies to memes the same framework of *The Selfish Gene* by Dawkins to conclude that humans, and society could be the carriers of memes in their competition across time. As noted by Howard Aldrich, this would imply the need to give up individuals as objects of our research (Murmman et al., 2003).

In a different vein, but with the target of social sciences and human behavior, Sober, Wilson, & Wilson (1999) in *Unto others*, defend the idea of group selection, to provide a rationale for the evolution and stability of altruistic behavior.

It is our belief that the evolution of genetics opens up the opportunity of rethinking the way in which we conceive levels of research in organization theory and we will show how existing research can be re-conceptualized under this framework. In attempting to define a simplified model to account for the modern synthesis of evolutionary genetics to compare to organizational

genetics, we identify a set of dimensions for analysis, derived from the field of evolutionary genetics (Wade, 2008; Odum, 1983).

At the roots of evolutionary genetics lies a unit that is constituted by information, can be reproduced, can be transferred through reproduction, and can exhibit different variants (*gene*). Genes are not directly observable in their relation to action, but are related to the sum of external characteristics that affect behavior and appearance (*phenotype*) of a specific carrier (usually, an organism). The *relationship* between genotype and phenotype is complex, and interdependent, so simple causality does not suffice. However, such relation is not reversible, and the specific genotype of an organism cannot be changed, while it is possible to change the phenotype. Organisms are subject to *natural selection processes*, some of which can be directly related to the phenotype they exhibit. Natural selection processes operate through the *survival* of the specific organism to the moment when it can reproduce Table 1.

On these bases, we develop our schema for analysis of organizational theories (Table 1).

Table 1. Framework for analysis

Dimension	Evolutionary genetics
Unit of mutation	Gene/alleles
Unit that carries the unit of mutation (i.e. carrier)	Organism
Relation between unit of mutation and carrier	Alleles influence phenotypical characteristics of the individual organism
Sources of mutation/variation	Mutation Random genetic drift
Sources of selection	Natural selection/ pressure for survival
Reproduction mechanisms	Breeding
Measure of success	Survival/Diffusion

Source: own elaboration

3. Genetics and evolution in organizational theory

The power of the evolutionary analogy in organization theory has led to fruitful middle level theories (Van de Ven & Poole, 1995). Organization ecology proposed to look at populations of

organizations as species occupying the same niche and going through processes akin to those studies by evolutionary ecology (Carroll & Hannan, 2000; Hannan & Freeman, 1993). Organizational systematics extended the logic of taxonomy from the kingdom of nature to the society of organizations (McKelvey, 1982). Evolutionary economics considered routines as patterns of behaviors that could be treated as analogous to genes, and were subject to variation, selection, and reproduction processes (Nelson & Winter, 1985).

Although the links between these theories were numerous and explicit, we have not witnessed the emergence of a consistent paradigm, but a proliferation of different evolutionary organizational theories. One of the reasons for the failure of developing a consistent, and unified field of research is the lack of a common analysis of the foundations for an organizational genetics theory. While Nelson & Winter (1985) adopt routines, Carroll & Hannan (2000) refer mainly to organizational populations, and appear to be more concerned with revealing demographic processes at work at different levels, than connecting the dots across levels.

In our opinion, the central question is related to the problem of whether we accept the individual as the smallest unit of analysis in organization theory. It is useful to cite an excerpt of Howard Aldrich comment on this issue:

“One last, even more radical notion: contained in a book by Susan Blackmore (1999) called *The Meme Machine*. Let’s accept the argument that, in fact, she’s right, and let’s take routines and competencies as the equivalent of memes. Humans, decisions, strategies, and so forth would not be our focus anymore. Those are all, again, simply ways in which routines and competencies make copies of themselves. It’s a fairly radical way of thinking about selection logic. It means that if we truly focused on routines, competencies, practices, and so on, we would not follow people anymore in our research. Instead, we would follow how competencies spread, replicate, and insinuate themselves into organizations. People would disappear from our equations” (Murmann et al., 2003:27).

Obviously, accepting the idea of ‘people disappearing from our equations’ is a rather strong departure from the traditions of organization theory, and amounts to a change in the ontological status of organization theory, pushing it almost outside of social sciences. On the same vein, Jahoda (2002) criticizes the limit of Blackmore’s contribution to the debate on imitation and memes, he concludes raising the major issue of agency. While Blackmore does not consider the

individual as the actor of imitation, Jahoda (2002) discusses how previous literature did not do so, and appears to be critical over the soundness of Blackmore's choices.

As we pointed out earlier on, here we are not addressing the issue of the importance of deliberate, social action by individuals, but advocating the space for an interpretation of organizations as composed by smaller units of analysis that are not directly linked to individuals. It is a longstanding debate that could be brought back to ontology in philosophy so far back in time as to Plato's view of reality and ideas. In more recent times, this issue has to do with the divide between Durkheim's view of society as composed by objectified social acts, and Weber's view of intended action. Our goal is simply to reveal to what extent existing organizational theory is using the analogy to organizational genetics, and propose the deliberate adoption of this perspective in future theorizing. Clearly, we are still thinking of a middle-range theory.

The extension of genetics to organization has opened different research paths, even though we are lacking a systematic review of how the different perspectives have adopted the analogy to genetics.

The basic idea within a biological analogy is to recognize the existence of (hidden) characteristics of specific organizations, which may or not be directly observed, but which exert an influence over collective behaviors and decisions, with relative inertia across time. Within such a framework, organizational genotypes lay at the basis of organizational phenotypes, directly observable (i.e. behaviors, tasks, expressed values and principles, processes, etc.) and related to the identity of the specific organization.

These genotypes would represent relatively inert characteristics, which make a specific organization somewhat unique and identifiable, no matter what happens to its phenotypes. The relation between genotypes and phenotypes would be characterized by the same ambiguity of the relationship between biological genotypes and phenotypes, ruling out any determinism, and accepting the influence of the external context in the development of phenotypes observed at each time.

Within this perspective, different theories across organization theory and strategic management theory appear to be of interest in the development of this new framework. The major difference is between theories that explicitly recognize their link to evolutionary biology and theories, which do adopt the same framework, without an explicit link. We choose to define the first group as theories exhibiting *ontological* links to evolutionary genetics (i.e. observing and interpreting the

world of organizations as constituted by evolutionary elements and processes), and the second group as theories exhibiting *epistemological* links (i.e. adapting a similar framework, but with no explicit use of evolutionary elements and processes derived from evolutionary genetics).

In the following section we explore the most relevant theories that we consider linked to organizational genetics.

3.1. Ontological links to evolutionary genetics

Several organizational theories have used the evolutionary analogy explicitly. There are differences among them on how it was extended to the analysis of organizations.

We are now briefly analyzing them, according to our framework for comparison with evolutionary genetics (see Table 1: p. 8). It is important to notice that we do not set out to describe these theories and the debates that characterize them in depth, but to illustrate how they are connected to evolutionary genetics.

Among ontological related theories, we can distinguish different levels of adherence to evolutionary genetics, according to whether they use all or some of the following:

1. analogy to genes
2. phenotypical characteristics
3. evolutionary processes (variation, selection, reproduction).

Evolutionary economics (Nelson & Winter, 1985), which introduced the concept of routines in relation to organizational change, combine all three elements. The exact definition of routines is still disputed. Becker (2004) in his review of the theory, provides evidence of the fact that routines are consistently considered patterns, but there is a lot of variation in terms of what they are a pattern of (activity, action, behavior, or interaction). More recently, literature seems to converge on the definition of routines as "repetitive, recognizable patterns of interdependent actions, carried out by multiple actors" (Feldman & Pentland, 2003:93). Routines are subject to evolutionary processes and affect macro-level phenomena (Pentland et al., 2012). Routines "are carried out by sociomaterial ensembles of actants that include artifacts" (Pentland et al., 2012:1486); therefore, they are not attributes of individuals alone. Routines are characterized by context-dependence, embeddedness, and specificity that limit the possibility of transfer and make them distinctive of individual organizations (Becker, 2004).

Organizational systematics (McKelvey, 1982) uses phenotypical characteristics to classify organizational forms at the population level. Three main components of systematics studies are: (1) taxonomy, the development of a concept of organizational differences; (2) evolution, the tracing of the lineages of organizational form; and (3) classification, the development of procedures for identifying and placing organizational forms into classes (McKelvey, 1982). Organizational systematics has favored the definition of populations of organizations with reference to the function they perform, more than identifying underlying characteristics that might make organizations similar across different industries. However, McKelvey coins the concept of *comps* to identify a mixture of more or less irreducible units or particles that originate organizational competences.

Organization ecology (Carroll & Hannan, 2000; Hannan & Freeman, 1993) adopts evolutionary processes that operate on phenotypical characteristics. The theory originated to explain change and variation in organizations by exploring the impact of selective pressures, instead of adaptation. The cornerstone of the theory is the analogy of population of organizations to population of living entities. Populations of organizations are considered as the embodiment of a blueprint (the organizational form) and are subject to evolutionary pressures related to environmental, and internal factors. Populations occupy a specific niche in the environment and can grow until they come close to carrying capacity. This process leads to density-dependence, which can be observed through the empirical analysis of birth and death rates (founding and disbanding of organizations within a population). A cornerstone of the theory is the expectation of structural inertia in organizations that allows selection to operate. Structural inertia affects *core* organizational features (goals, forms of authority, core technology and market strategy).

The **theory of sensemaking** (Weick, 1995) is based on the development of a model of sociocultural evolution, which is directly linked to the use of an alternate view of the evolutionary process. Adapting the evolutionary process to organizations, Weick substitutes the process of enactment to the process of variation. The process of enactment is the process through which actors create the environment, shaping it and defining the relations among the objects that inhabit it. As for variation not all enactment acts are selected and reproduced. The evolutionary cycle therefore reproduces organizations every day, by shaping the sensemaking processes of actors. Clearly, sensemaking uses the evolutionary cycle, but does not appear to define a clear analogy to genes. Moreover, though relatively stable, the structure of reification of reality are a product of human action. Their dynamics through time is not fully analyzed by Weick, even

though he proposes to look at occasions for sensemaking as the roots for enactment processes. Alongside established theories, there are some theory fragments, which incorporate some of the features of evolutionary theories. Stinchcombe (1965) emphasizes how organizations incorporate specific characteristics at founding and are then relative inert to change. These characteristics are rooted in what Stinchcombe defines social technology in use at the time of founding. According to Kaufman (1991) organizations are created out of a sort of milieu of resources that they rely on for their survival. Every organization survives until the exchange of resources is possible. The pattern of resource utilization makes every single organization different from the others.

3.2. Epistemological links to evolutionary genetics

Alongside theories that explicitly link organizations to evolutionary genetics, it is fruitful to consider other approaches that exhibit some characteristics of the evolutionary model. Our focus, clearly, is on theories that assume the existence of organizational characteristics or dimensions that render every organization somehow unique. It should be noted, in fact, that to postulate organizational genetics, we need to assume the existence of a distinctive set of unique characteristics that are relatively stable and related to the identity and uniqueness of their carrier.

Under this perspective, we identify three approaches that satisfy this condition. We are describing their main characteristics with reference to our endeavor hereafter.

Organizational culture was brought back to attention in organization studies by Jaques (1952) and originated several different streams of analysis. According to Sober, Wilson, & Wilson (1999), culture is the most difficult organizational attribute to change. For our purpose, we adopt Schein's theory (1991). According to Schein culture is a stratified concept. At its roots lie basic assumptions that manifest through values and behavioral norms that are in turn embodied in artifacts. Basic assumptions are taken for granted by the members of a culture and shape the way they perceive their reality. They are grounded in phenomenological theories of reality (Berger & Luckmann, 1967).

The next level of Schein's model is composed by values that can be defined as individuals' preferences regarding certain aspects of the organization's culture.

The third level is where artifacts can be seen, felt and heard by the uninitiated observer as organizational attributes. Artifacts can be classified in different categories: objects (logo, costumes,

uniforms, products, etc.), verbal expressions (jargon, stories, myths, speeches, etc.), and activities (ceremonies, communication patterns, traditions, etc.).

There are obvious assonances to Karl Weick interpretation of organizations, even though Schein is not addressing the issue of how they might change, but assumes them as relatively stable dimensions of any single organization. In its essence, his model identifies some hidden and relatively inert characteristics that lay at the basis of an organization and exert influence on the visible patterns and structures of the single organization.

Core competencies are the collective learning in the organization, especially how to coordinate diverse production skills and integrate multiple streams of technology (Prahalad & Hamel, 1990: 4). Core competencies characterize specific organizations making them unique and allowing them to acquire a competitive advantage. According to Prahalad & Hamel (1990), core competencies require many years to be acquired and developed and are relatively inert to change. They cannot be easily transferred, unless through acquisition processes. They can decline in time if not invested into. Strategic management according to the core competence view transforms itself into the development of a sound strategic architecture whereby organizations invest in business related to higher expected returns due to the use of their unique competencies.

Aston organizational measures (Pugh, Hickson, Hinings, & Turner, 1968; Pugh et al., 1963) were designed to capture the characteristics of organizations, within a structural framework. The research group at Aston identified some structural characteristics of organizations (specialization, standardization, formalization, centralization, configuration, and traditionalism) and set out to measure them. The Aston Group surveyed organizations of diverse types, spanning manufacturing and service organizations and public and private sectors. Their research lead them to distinguish two dimensions of organizational structure: structuring of activities and concentration of authority.

4. The organizational genetics framework in organizational theory

In this concluding section of the paper we attempt at identifying common threads across the very different perspectives, in order to define theoretical propositions relative to how organizational genetics could develop as a field by itself.

Consistent with our framework for analysis, we compare the different organization theories on the defined dimensions. The results are portrayed in Table 2.

Our analysis reveals the existence of heterogeneity in the way different theories have dealt with the issue of identifying the fundamental characteristics of an organization. Much of this heterogeneity, though, is in the terminology that was used or in the level of analysis (organization vs. population), while theories are consistent in identifying root characteristics, and provide similar definitions if we escape the trap of language. Another major issue is agency. Several theories explicitly accept agency as a force that shapes evolutionary processes, while other do not exclude it. While the debate over agency has been a key criticism of some theories related to evolutionary biology (Donaldson, 1995), it should be noted that the introduction of "On the Origin of species" by Charles Darwin develops the idea of natural selection from the observation of man-made selection. Therefore, the idea that the smaller unit of organizations should not be considered the individual, does not rule out the issue of agency by individuals. However, it is a fact that the greatest heterogeneity among theories is in the use of evolutionary processes to account for change and evolution.

The comparison across existing theories points to the importance of providing a consistent framework for research on the smallest component of organizations.

Organizational genetics. We propose to define organizational genetics as the field in organizational theory that has the goal to identify the smallest component of organizations. We depart from most existing theories by virtue of the fact that they consider the unit of mutation an observable object or set of objects, and end up emphasizing the possibility of change and action.

Organizational meme. Our view is closer to the perspective put forward by Schein (1991), because we consider the smallest unit of organizational genetics, that we term organizational meme as a characteristic that constrains action to some recursive patterns, relatively stable over time, and related to the identity of the organization.

Consistent with Schein we believe that organizational memes can best be captured by observing the relationship between members of an organization and their artifacts. We equate artifacts, behaviors, and their interaction to phenotypical characteristics exhibited by organizations, and we think they can best be conceptualized as "sociomaterial ensembles of actants that include artifacts" (Pentland et al., 2012: 1486). However, we depart from Schein's organizational culture theory in referring to organizational memes as components that are lying even behind basic assumptions.

We borrow from Karl Weick the idea that organizational memes might be conceived as powerful mental maps that structure the way an organization shapes reality within its boundaries. We depart from Karl Weick in the fact that we do not believe these maps to be enacted and re-enacted by individual actors, but we attribute them an ontological status and consider them social facts that assume an entity by themselves and somehow shield them from sensemaking processes.

Impact of organizational memes. Organizational memes structure the internal environment of organizations limiting the alternatives available to organizational members. They are powerful schemes for action, but also frames for action and perception of organizational facts and acts. At the macro-level they make an organization unique, notwithstanding the individual members that might inhabit it through time.

Methods for the analysis of organizational memes. Organizational memes cannot be directly measured or analyzed. However, the nature of their constraining effects on behaviors suggests to adopt qualitative and ethnographic approaches with the goal to identify what constraints to interpretation and action are present in the organization. The method of inquiry shows a strong analogy with Cognitive Therapy (Beck, 1979). The analysis aims at revealing which factors constrain thinking, behaviors, and emotional responses. Whenever recurrent courses of action are present, and alternatives appear to be absent and not considered, this would be a strong indication of something, which is rooted in organizational memes.

It is important to note that organizational constraints on behaviors can be both beneficial and damaging to the organization in different contexts. When related to behaviors that are favored by the environment, organizational memes act as a source of competitive advantage. On the contrary, when change is needed, they exert extreme negative pressures to change.

5. Conclusions

Theory building is a complex endeavor, and requires a long process of careful crafting of concepts and ideas. This paper is an initial attempt to provide ground for a new field of research in organization theory. It greatly develops its ideas on the shoulders of existing theories, trying to find bridges across them that might lead scholars to consider the opportunity of taking a different look at the levels of analysis in our scientific domain.

As most, earlier theoretical papers, it suffers from incompleteness and will require intensive discussion and confrontation with colleagues who might provide additional substance or powerful criticisms to our statements.

However, it points out the existence of different perspectives that from different angles and within different epistemic realms, converge on the idea that there is more to organizations than what appears, and what can be directly related to individuals. Most of the theories were not as developed when they started being framed, and they still suffer from incompleteness as revealed by our analysis. However, they provided new ideas and produced a vivid debate that resulted in new research being realized and new concepts being explored.

Our goal at this stage is to set the dice rolling and open up a debate to be able to capture enough ideas and reactions so to craft our proposal in more detail.

Table 2. Organizational theory perspectives, and genetics

<i>Dimension</i>	Unit of mutation	Unit that carries the unit of mutation (i.e. carrier)	Relation between unit of mutation and carrier	Sources of mutation/ variation	Sources of selection	Reproduction mechanisms	Deliberate action	Measure of success
<i>Evolutionary genetics</i>	<i>Gene/Alleles</i>	<i>Organism</i>	<i>Alleles influence phenotypical characteristics of the individual organism</i>	<i>Mutation Random genetic drift</i>	<i>Natural selection/ pressure for survival</i>	<i>Breeding</i>	<i>Yes, through artificial selection or gene manipulation</i>	<i>Survival/ Diffusion</i>
<i>Evolutionary economics</i>	Routines	Organization	Routines affect macro-level capabilities	Mutation Experiment	n.a.	n.a.	Yes/No	Survival
<i>Organizational systematics</i>	Comps/ Compoles	Population	Comps nature and relative frequencies determine different populations	Changes in the frequency of comps either deliberate or casual	Environment	Transfer of comps from one generation to the following	Yes, through action on comp frequencies and mix, but there might be barriers between organizations (i.e. speciation)	Survival at the population level
<i>Organizational ecology</i>	Goals, forms of authority, core technology and market strategy	Population	Core characteristics define the organizational form	Audiences	Environment Community level ecology	Imitation of organizational form	No, inertia	Survival at the population level
<i>Sensemaking</i>	Mental maps	Actors	Actors use mental maps to reify reality	Sensemaking Enactment	n.a.	n.a.	Yes/No	Stability of enactment
<i>Organizational Culture</i>	Basic assumptions	Organizational Culture	Basic assumptions influence values and artifacts	n.a.	n.a.	Socialization of new members	Yes/No	n.a.
<i>Competence view/Resource based view</i>	Core Competencies	Core Products: the physical embodiment of one or more core competencies	Core competencies are embodied in core products	Mergers and acquisitions	Management choice	Investment in developing core competencies	Yes	Competitive advantage Innovation
<i>Aston Organizational measures</i>	Structural dimensions	Organization	Dimensions define the organizational structure	Deliberate design	Management choice	Deliberate design	Yes	Performance
<i>Organizational genetics</i>	Organizational memes	Single organization	Organizational meme constrain action to some recursive patterns	Random drift over long periods of time	Random	Embeddedness in artifacts and in sociomaterial actants	No	Persistence

Source: own elaboration

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Editorial Design

Aleteia Communication

July 2013

Edited by

Enel External Relations Department

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00198 Rome, Viale Regina Margherita 137 – Italy

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