

The concept of transduction and its use in organization studies

Abstract

This paper discusses the concept of transduction introduced by French philosopher Gilbert Simondon as a generalized model for the individuation of entities, that is, when heterogeneous resources are brought together and temporarily stabilized into functional units. Simondon's thinking, influential in Deleuze's philosophy and Stiegler's view of technology, is then used to examine two non-reductionist theoretical frameworks of organization, Schatzki's concept of the "site of the social" and Czarniawska's "action nets". Both these two theories of organizing adhere to a generalized model of organizing that is fruitfully examined through Simondon's work. The paper concludes that process-based theories of organizing, indebted to Weick's (1969) seminal work, may be increasingly influenced by what in the paper is called biophilosophical writings, theories addressing the ceaseless becoming of biological organisms.

Keywords: Transduction, Biophilosophy, Gilbert Simondon, Site of the social, Action nets.

Introduction

The concept of organization has been continuously debated in the field of management studies. Ever since Karl Weick in 1969 suggested that one should examine process of organizing than organizations as stable and fixed entities, various process-based views of organization has been advocated. Some writes makes references to the concept of social practice while other draws on theoretical frameworks such as complexity theory or evolutionary theory. This paper will discuss a process-based view of organization in the Weickian tradition with reference to a theoretical framework that Keith Ansell Pearson (1999) calls *biophilosophy*, that is, philosophy addressing matters pertaining to biology, the life sciences, medicine, and other disciplines examining and exploring organisms and forms of life (Lash, 2006; Fraser, Kember and Lury, 2005; Grosz, 2004; Burwick and Douglass, 1992). A biophilosophical framework accommodates research asking questions such as “what is life?”, “how can organisms evolve over time?”, “what are the ultimate matter in organisms?”. During the massive growth of research in biochemistry and biotechnology and when new technologies such as nanotechnology are emerging (Milburn, 2004; Thomas and Acuña-Narvaez, 2006), such philosophical concerns is no longer merely metaphysical speculations of interests to a rather limited group of *Fachphilosophen* but is gradually becoming of great importance when sorting out how one should separate between life and non-life, ethical and unethical health care procedures, and so forth, when technologies such as genetics, genomics and proteomics become part of the life sciences. Important contributors to the field of biophilosophy are Aristotle, Lucretius, Henri Bergson, Alfred North Whitehead, Pierre Teilhard de Chardin, and more recent thinkers such as Gilles Deleuze, Donna Haraway, Evelyn Fox Keller, Elizabeth Grosz, and Manuel DeLanda. More specifically, this paper will draw on the writings of the French philosopher Gilbert Simondon, a thinker to date rather

obscure for an Anglo-American and English-speaking community but gradually becoming explored as the interests for biophilosophical thinking increases. Gilbert Simondon's work, presented in the two volumes *L'individu et sa genèse physico-biologique* and *L'individuation psychique et collective* (today, Shaviro, 2007 reports, both reprinted in a new French edition entitled *L'individuation à la lumière des notions de forme et d'information*), is unfortunately not yet translated into English but there are some secondary texts enabling an introduction of his ideas. Simondon, whose thinking is also applicable to technology studies (see Simondon, 1980), is concerned about what he refers to as *individuation*, how individuals are constituted through a process of wherein various resources in the environment are mobilized and assembled. Simondon's work, a source of influence for Gilles Deleuze and Félix Guattari's (1988, pp.408-410) concept of *machinic phylums*—that is, a “flow of matter” that is “itinerate” and “ambulate”, or “a destratified, nonlinear flow of matter-energy” DeLanda's (1992, p.151)—does not assume that the individuality of artifacts or organisms is a starting point but rather the outcome from what Simondon calls *transduction*, the accomplishing of a metastable position where the individuation is temporarily settled. Simondon's theoretical framework has been used in technology studies (Stiegler, 1998) and in geographical accounts of how computer code is producing space (Dodge and Kitchin, 2005); “Space is not a container with pre-given attributes frozen in time; rather, space gains its form, function, and meaning in *practice*. Space emerges through a process of ontogenesis”, Dodge and Kitchin (2005: 172) argue. In the latter half of the paper, two models of organization introduced by Schatzki (2002) and Czarniawska (1997, 2004) will be examined as process of individuation wherein organizations are constituted as coherent and integrated unities, that is, in Simondon's vocabulary, individuated. The paper concludes that Simondon's writing offers a dynamic and original theoretical model for understanding how stability and change are inextricably bound up with one another and how organization and any other social or

biological entity are metastable systems continually being influenced by and influencing and relating to the environment.

Biological life and the concept of transduction

Georges Canguilhem (1992, p. 58) contrasts the notions of the machine and life. For Canguilhem, life denotes “experience, meaning improvisation, acting as circumstances permit”. Therefore, life can (occasionally) permit deviations from the norm, that is, various forms of “monstrosities”. In the domain of machines, however, there are no such possibilities for monstrosities: “Whereas monsters are still living things, there is no way to distinguish the normal and the pathological in physics and mechanics. Only among living beings is there a distinction between the normal and the pathological” Canguilhem (1992, p. 58) says. Only in biological systems can there be a radical openness; in mechanics, closed systems prevail. De Landa (1992, p.129) speaks of the need for abandoning “conservative systems” when recognizing ontologies and epistemologies: “[a] century-old devotion to ‘conservative systems’ (physical systems that, for all practical purposes, are isolated from their surroundings) is giving way to the realization that most systems in nature are subjects to flows of matter and energy that continuously move through them” (DeLanda, 1992, p. 129). Recent development in for instance complexity theory is posing a real challenge for such “conservative systems” and concept such as *emergence* (Holland, 1998), *autopoiesis* (Maturana and Varela, 1980) or *dissipative structures* (Prigogine and Stengers, 1984) are some alternative theoretical frameworks capturing the movement towards what Tsoukas (2006) calls open-world ontologies in the sciences. In general, such ontologies open up for alternative images of being: “The image of a stable world, a world that escapes the process of

becoming, has remained until now the very ideal of theoretical physics . . . Today, we know that Newtonian dynamics describes only part of our physical experience,” Nicolis and Prigogine (1989, p. 52, cited in De Landa, 2002, p. 83) suggest. Elsewhere, Nowotny (2005, p. 16) points at the implications from open-world ontologies:

The climax of high modernity with its unshakeable belief in planning (in society) and predictability (in science) is long past. Gone too is the belief in simple cause-effect relationships often embodying implicit assumptions about their underlying linearity; in their place is an acknowledgement that many—perhaps the most—relationships are non-linear and subject to ever changing patterns of unpredictability.

Thinking in terms of such open and non-linear systems demands a new vocabulary and a new conceptual framework, that is, a new cartography including new images of organization forms.

Gilbert Simondon’s (1992) work is applicable when examining processes of ceaseless and open-ended becoming. Simondon’s work, written in the 1950s and early 1960s, is little attended to in the English-speaking world but is of interest for anyone conceiving of artifacts such as technology, organisms, or social formations as being metastable entities accomplished through processes of what Simondon calls individuation. Schmidgen (2004, p. 5) points out that Simondon’s work is “written in a rather unconventional style” and contains few quotations and references. Instead, the goal of his texts is to “inaugurate an appropriate philosophical language for the question of technology”. Schmidgen (2004) is primarily concerned with Simondon’s (1980) writing on technology and how technology is individuated into *technological elements*, *technological individuals*, and *technological totalities*, or *ensembles*. It is also for Simondon’s treatment of technology, further developed by for instance Bernhard Stiegler (1998) and Deleuze and Guattari (1988), that he has been noticed

in the English-speaking world (Dumochel, 1995). However, Simondon's work is concerned about individuation as a generic process and his theoretical models are applicable to equally technology, organisms or social formations such as organizations. Simondon is examining the notion of individuation as the process wherein the individual is constituted, is "individuated" (Hansen, 2006; Beistegui, 2005; Chabot, 2005). Rather than subscribing to an Aristotelian "hylomorphic scheme" (Simondon, 1992, p. 316) using a static separation between form and matter, Simondon seeks to outline a more dynamic process of individuation taking into account the becoming of the individual. For Simondon, a living system is a "system of individuation" but also a "system that individuates itself" (Simondon, 1992, p. 305); there is a dynamic relationship between the constituted entity (i.e., individual) and the constituting process. Simondon explicates this idea:

The living entity is both the agent and the theater of individuation: its becoming represents a permanent individuation or rather *a series of approaches to individuation* progressing from one state of metastability to another. The individual is thus no longer either a substance or a simple part of the collectivity. The collective unit provides the resolution of the individual problematic, which means that the basis of the collective reality already forms a part of the individual in the form of the preindividual reality, which remains associated with the individual reality. (Simondon, 1992, p. 307)

"Living matter is far from pure indetermination or pure passivity. Neither is it a blind tendency; it is, rather, the vehicle of informed energy", Simondon (1980: 66) says. When a system individuates itself it is becoming "metastable". Metastability is different from "stable equilibrium and rest" because it takes into account the potential energy of the system, the notion of order, and the increase in entropy. Simondon (1992) is here speaking of *ontogenesis* (i.e., how something is *coming to be*) rather than *ontology* (i.e., how something *is*) and is thus

interested the constitution of entities and individuals. Simondon uses the term *transduction* to denote the entire process of individuation into a metastable unity. Transduction thus means any process, “physical, biological, mental or social” (Simondon, 1992, p. 313), in which metastability emerges (see also Mackenzie, 2002, p. 15-16). Transduction is thus a concept emphasizing the radical openness and emergence of any entity.

Transduction corresponds to the presence of those relations created when the preindividual being becomes individuated. It expresses individuation and allows us to understand its workings, showing that it is at once a metaphysical and also a logical notion. *While it may be applied to ontogenesis, it is also ontogenesis itself.* (Simondon, 1992, p. 314. Emphasis in the original)

The concept of transduction is used in a range of scientific disciplines to denote various processes of change in form and matter. For instance, in molecular biology transduction denotes a specific event in which a virus carries new genetic material over into the DNA of bacteria (Mackenzie, 2002, p. 17). Simondon (1992, p. 311) similarly speaks of the “unfolding of the being” as the process in which the entity or individual is “individuating”: “The transductive process is thus an individuation in progress. Physically, it might be said to occur at its simplest in the forms of progressive iteration . . . Transduction occurs when there is activity, both structural and functional, which begins at a center of the being and extends itself in various directions from this center, as if multiple dimensions of being were expanding around the central point” (Simondon, 1992, p. 313). For instance, an individual is not simply being inscribed with qualities, potentialities and shortcomings but is actively making use of resources, be they material, emotional, social or cultural, to influence or alter the view of the individual: “the individual” is never given in advance; it must be produced, it must coagulate, or come into being, in the course of an ongoing process”, Shaviro (2007) says. Beistegui,

(2005) emphasizes that metastability is the accomplishment of a temporal and transient form of stability that is “neither order nor chaos”: “[T]he metastable system is neither order nor chaos, neither rest nor motion, neither pure nor random becoming. A metastable system is a system that, whilst not contradicting the second law of thermodynamics, which stipulates that, in the long term, all differences in energy will be cancelled, harbours within itself a sufficient amount of energy—of differences of potential, in other words—to create order” (Beistegui, 2005: 119). Lecourt (1998) points at the fallacy to examine existing forms in order to unravel the innate qualities of organisms:

The individual emerges only as a result of a process of individuation, and it is futile to look for the principles in the form taken by the result. The speed of this process is always affected by the ‘pre-individual’, from which the individual is never more than sporadically and partially detached, as well as by the ‘transindividual’ into which its being must be inserted. (Lecourt, 1998, p. 222)

The *transductive unity* (Simondon, 1992, p. 311) accomplished is however only metastable since the ontogenesis of the individual is always a matter of ceaseless becoming. Simondon’s framework is useful because it manage to move beyond and undo the established epistemological dualities (e.g., form and content, message and medium), without “entire abolishing them” (Shaviro, 2007).

Simondon’s notion of transduction is applicable for equally biological organisms and social organization. Mackenzie (2002, p. 17) argues: “Life is transductive too, but involves temporal and topological complications. The living encounters information understood strictly as the unpredictability of forms and signals, as a problem. It resolves the problem through constant temporal and spatial restructuring of itself and its milieus. It develops and adapts, it remembers and anticipates”. The concept of transduction thus offers a concept that grasps

how living and non-living processes differentiate and develop without presuming underlying substances or identity: “Every transduction is an individuation in process. It is a way something comes to be, an ontogenesis” (Mackenzie, 2002, p. 18). Moreover, transductive unity is achieved through the combination of “physical, technical and affective realities” (Mackenzie, 2002, p. 35). Transduction is potentially useful in organization analysis because it focuses on the folding of different forces and elements together in the individuating of individuals, collectives and entities. For instance, to use a particular technology as an example, a technological artifact, say an axe, is neither wholly determined by culture nor determining culture but is individuating qua technological artifact through the association of various material, cultural and social resources and processes. The metastability of the axe as a transductive unity means that the technological artifact is not once and for all fixed but is gradually undergoing new forms of individuation. As several analysts of technology point out (Barley, 1986, 1990; Orlikowski, 1992, 2000; Bijker, 1995), human construct technology and technological ensembles but once such technology or technological ensembles are in place, they affect human behaviours and interaction. “After all, it is we who adapt to the machine. The machine does not adapt to us”, Friedrich Kittler says (cited in Armitage, 2006, p. 36. See also Lenoir, 1998, p. 15). “In the industrial age, the human is not the intentional origin of separate technical individuals qua machines. It rather executes a quasi-intentionality of which the technical object is itself the carrier”, Stiegler (1998, p. 67) argues. The individuation of the technological artifact is then a transductive process comprising a variety of resources. It is never self-enclosed or enfolded but is, quite the contrary, in a process of becoming through its various associations and connections. A tool is individuated as a set of relations, a multiplicity, not as a singularity: “The technical object exists . . . as a specific type that is arrived at at the end of a convergent series. This series goes from the abstract mode of to the

concrete mode; it tends towards a state at which the technical being becomes a system that is entirely coherent with itself and entirely unified” (Simondon, 1980, p. 16).

What is of particular interest in Simondon’s theoretical framework is, Shaviro (2007) points out, that it actively undermines the predominant view of information advanced by the cybernetic theory of Norbert Weiner (1948), the principal doctrine for both computer science and other disciplines invoking the concept of information as an elementary unit of analysis (Hayles, 1999). In the cybernetic understanding, information is immaterial, capable of existing detached and disembodied from its carriers. In the transduction perspective, information is instead always entangled with a given medium. Shaviro (2007) argues: “[t]ransduction is never independent of its material medium in the way that we sometimes imagine ‘information’ to be. The medium has a great degree of influence on what patterns are possible and how they can be propagated. Just as Simondon shows the process of individuation to take place *in between* ‘form’ and ‘matter’—rather than being the sheer imposition of an already-existing form upon a previously shapeless matter—so ‘information’ cannot just be abstractly opposed to the medium in which it is instantiated, or across which it is transmitted. Medium and message intersect”. The same point is emphasized by one of Simondon’s contemporaries, the French philosopher Raymond Ruyer (for an introduction, see Wiklund, 1960), who argued that information requires “a frame to be constituted as information, and that frame is provided by the active constitution and assembly of human embodiment” (Lenoir, 2004, pp. xxii-xxiii). As we learn from the modern biosciences and biotechnology applications such as pharmacogenomics and proteomics, the DNA is a form of “factory” producing proteins that in turn is determining the functioning of the cell and the organism (Jones, 2004). As suggested by for instance Katherine Hayles (1999), the human organism is *informational* before it is *material*; the reproduction of the cells and the

organisms as such is dependent on the circulation of information. Scott Lash (2006) here speaks of a *vitalist* view:

Vitalist or neo-vitalist themes are particularly useful in the analysis of life itself. Here vitalism influenced thinker such as Donna Haraway and Katharine Hayles who put things in reverse. They understand not the media in terms of life, but life in terms of media. The study of life becomes the question of 'biomedia'. Thus genetic coding almost seems to be an extension of the coding of media and messages. If media in the age of digital media are increasingly algorithmic or are forms generated by set of instructions, then so are forms of life, by genetic instructions. Thus a mediatic principle or algorithmic principles also structure life. (Lash, 2006, p. 328)

Seen in this view, Simondon's dynamic and non-reductionist concept of transduction, overcoming the dualities of hylemorphism and other reductionist views of the individual is what is more adequately capturing the recent findings in the biosciences than systems theories and cybernetics.

To summarize the arguments, what Simondon (1992) calls a metastable transductive unity, a biological organism, a technological artifact or any other individuated entity, is based on a process of continuous becoming wherein transient states of metastability are accomplished. The transductive unity is an outcome from a process of creation and becoming, not fettered to predetermined relations, mechanisms and causalities, but capable of moving in many directions when responding to information. Simondon's work is providing an integrated theoretical framework from which a variety of social and technological entities can be examined.

The organization as transductive unity

In this section of the paper, two non-reductionist models of organization will be examined. “Non-reductionist” does here denote that the models are not assuming that organization derives from a particular activity, entity or actor (e.g., a particular routine, a technology such as computers, or the sales force or employees in the R&D department) but that organization as an ongoing process of change and interaction is constituted by the active bringing together of heterogeneous resources into a coherent and commonly understood framework. First, Schatzki (2002) advocates what he calls the “site of the social”. The site of the social is a particular form of organization, “a mesh of practices and orders” and a “contingently and differentially evolving configuration of organized activities and arrangements”. (Schatzki, 2002, p. xii). Schatzki’s analysis is focused on what may be called an organization *a priori*, a generalized and formal model of organization applicable to various cases. For Schatzki, it is important to recognize the relationality of social configuration. The entities of an organization “determine one another via their connections” (Schatzki, 2002, p. xiii). Human action, interaction, artifacts and practices thus coexist and jointly constitute one another. Schatzki’s model includes three principal concepts: *Orders*, *arrangements*, and *practices*. Order is the “basic dimension of any domain of entities”, the way that things are laid out and “hang together” in a particular setting (Schatzki, 2002, p. 1). An arrangement is a second-order concept wherein entities, practices, meanings, and other relevant resources are occupying positions in a more practical sense than the order (Schatzki, 2002, p. 20). While the order denotes an original structure of the domain, the arrangement is a practical outlining of resources—their location in a domain of practice. Finally, a practice is defined rather loosely as “a set of doings and sayings” (Schatzki, 2002, p. 73), that is the active engagement with practical matters. The relationship between arrangement and practices is a recursive one

wherein the arrangement is enabling thoughtful and legitimate practice and where practices is what in turn stabilizes arrangements and make them legitimate and credible. Schatzki (2002, p. 101) argues: “Practices establish particular arrangements. These arrangements are defined packages of entities, relations, meanings, and positions, whose integrity derives from the organization of practices”. Here Schatzki points at meaning as a central feature of the practice/arrangement assemblage. Meaning is for Schatzki not what is derived from outside of the practice/arrangement but what is “carried by and established in social practices”. He continues: “Meaning is not a matter of difference, abstract schema, or attributional relativity, but a reality laid down in the regimes of activity and intelligibility called ‘practice’” (Schatzki, 2002, p. 58). In addition to practices and arrangements, Schatzki points at the role of agents in his “site of the social”. Similarly to practices and arrangements being mutually constituting one another, an agent is both what is constituted and constitutive of practices/arrangements: Schatzki (2002, p. 209) explicates his position: “[I]t makes sense to say that an agent is both an arrangement and an effect thereof. An actor is its compositional network because anything is that which is it composed. An agent is also an effect of its compositional arrangements because its capacity to act as a single entity depends on the co-operation of its components”.

Schatzki’s concept of the site of the social is a generalized image of organization comprising orders, arrangements, practices, meaning, and actors, all being mutually constitutive. What is of particular interest is that Schatzki is seemingly rejecting the idea of a fixed Archimedean vantage point from which one can examine such social formations. Instead, recognizing the “demise of stability” and “decline of functionalism and its progeny” (Schatzki, 2002, p. 16) in the 1970s, Schatzki emphasizes the flux and becoming of his proposed model: “Relations, positions, and meanings, like the arrangements of which they are aspects, are labile phenomena, *only transitory fixations* of which can be assured”. (Schatzki,

2002, p. 24. Emphasis added). What is giving the practices/arrangement assemblages the impression of being immutable and stable lies in their ability to constitute mutually reinforcing relations and mechanisms supporting such relations. Practices/arrangements are never once and for all stabilized into a set of fixed and determinate positions but instead they maintain their status as metastable ensembles continuously adapting to new conditions. What enables social formations to maintain viable and reproduce themselves is not to be sought in the innate matter of things but in the multiplicity of relations and interaction between processes and practices on a single plane. Social reality is not to be examined “vertically” but horizontally, along series of interactions and in terms of relationality and not in term of fixed and immutable anchoring points.

Czarniawska (1997, 2004, 2006), making references to actor-network theory and laboratory studies in the science and technology studies tradition, is defending the concept of *action nets* as a fruitful image of organizations. In Czarniawska’s (1997, p. 41) definition, “[o]rganizations are not people at all (neither aggregates nor collectives of super-persons); they are *nets of collective actions* undertaken in an effort to shape the world and human lives”. Czarniawska wants to get away from, on the one hand, a unitary view of organization as fixed or stable configuration, and, on the other hand, a practice-based view strongly relying on human agents as the bearers of the organization. Organizations are neither things, nor are they wholly dependent on the agents enrolled in the process of organizing. Instead, action nets are interrelated processes, resources, routines, technologies, agents, and so forth, mobilized to accomplish socially enacted objectives. No matter how fluid and changing an organization, it is still capable of providing “solid effects”: “An action net is a compromise devised to embrace both the anti-essentialist aspect of all organizing (organizing never stops) and its apparently solid effects (for a moment things seem unchangeable and ‘organized-for-good’),”

Czarniawska (2004, p. 780) contends. Czarniawska emphasizes that action nets are capable of substituting various components such as routines or agents and is yet maintained:

Action nets are neither people nor groups; they may be large (across several organization fields) or small (a project); the focus of analysis can be a combination or collection of such nets (an organization field). It is from the action net that we deduce which actors are involved, not the other way around. This means, for example, that the net will never continue to exist even when the actors are exchanged for others, or the original actors change their identity (they may become machines), although it always means the change in the character of the net as well; that the changing net may press for a change in the identity of the actors . . . that the actors may be of fixed status (humans and nonhumans; Latour, 1992a, 1992b)—a fact we would miss if we looked exclusively at human actors and their interactions. (Czarniawska, 1997, p. 179)

In an action net perspective, organization and organizing are not determined by individual ideas or resources but are continuously evolving and unfolding when new beliefs or resources are established or are made available. Czarniawska is however emphasizing that the concept of action net is not aiming at being a “new theory” of organizing; it is instead an insistence on minimizing “that which is taken for granted prior to the analysis” (Czarniawska, 2004, p. 780). Rather than starting the analysis from the perspective on actors or organizations one needs to recognize that such entities and positions are the products of action nets rather the opposite—“Identities are produced by and in an action net, not vice versa” (Czarniawska, 2004, p. 780).

The other source of inspiration for the concept of the action net is neo-institutional theory, and thus predominant social ideas are continuously influencing action nets (Lindberg and Czarniawska, 2006). In addition, action nets are of necessity not simply located to

individual organizations or units but “[m]ay involve a great variety of organizations or organized groups of people of a loose or temporary nature” (Lindberg and Czarniawska, 2006, p. 293). For instance, in Lindberg and Czarniawska’s (2006) study of primary health care services in Sweden, a number of municipality organizations and health care units were mobilized to provide a clear and intelligible system for the end-user, the patient. The action net thus aimed at providing a seamless web of interactions between specialist groups and relevant authorities. Needless to say, the integration of different organizations adhering to different objectives, routines, and bodies of skills and expertise is not a trivial matter and studies of for instance the help and support provided for rape victims in the U.S. show that such action nets are to date not sufficiently integrated, leading to unnecessary concerns for victims of rape (Martin, 2005).

Similar to Schatzki’s concept of the site of the social, the concept of action net is rejecting any reduction of the organization to its individual components and is critical of the idea that agency is what produces outcomes and effects. On the contrary, agency is what is produced within sets of action nets and what enables positions and subjectivities. The strength and the viability of the action net lies, again, not in its individual components and their legitimacy, status, or position within broader organizational fields, but rather in the *relations* between components and resources. An action net precedes agency and is also capable of substituting components without ceasing to exist; it operates through its *connectivity*, its ability to connect and integrate heterogeneous resources into functional units, capable of delivering “solid effects” such as more adequate and reliable health care services. Just like Schatzki refuses to examine his practice/arrangement assemblage in terms of vertical relations and hierarchies, the functioning of Czarniawska’s action net is not to be found in its hierarchical arrangements but in its horizontal outline. Relations and integration between resources are what matters, and little besides.

Speaking in terms of transduction, a concept introduced to explore the individuation of an organism, a technology, or, as suggested here, a social system or a social formation such as an organization, both Schatzki (2002, 2006) and Czarniawska (1997, 2004) shares with Simondon the notions of metastability as what is temporarily accomplished in a domain characterized by fluidity and becoming. For Simondon, individuation is a process, an outcome, or an accomplishment wherein pre-individual states are encountering information from the environment. The seed does not, as Aristotle suggested, solely obey its innate potentiality, but also relates to and responds to its environment. The becoming-plant of the seed is then not following an enclosed and determinate process devoid of external influence but is instead the transductive process wherein seed and environment is co-existing—collaborating, if you will—and thereby individuating the plant as a metastable transductive unity. A similar process is observable in the development of technologies and technological ensembles. Technologies are developed, are gradually refined and recognized, and human's use of technologies and the relationship to complementary and completing technological systems shape metastable establishment of the technology. For instance, it would be virtually impossible to understand the development and large-scale commercialization of mobile telephone technology without recognizing its reception among consumers and the relationship between computer technology and other forms of communication technologies such as regular telephone systems. Mobile phones are transductive unities temporarily rendered metastable and becomes individuated because they are capable of responding to and making use of available information. A mobile phone does not have an "inner essence" or a "fixed form" or have any other hylemorphic characteristic but is instead a technological artefact located within a technological ensemble providing a series of services and uses appreciated by consumers and customers. New technologies and services are grafted onto the original technology; mobile phones become mp3-players, cameras, and so forth. In a similar manner,

as modern biochemistry and biomedicine is showing, the organisms is not wholly determined by its genetic material but instead, the gene is what is capable of producing a range of proteins that in themselves may operate in many different ways (Hedgecoe & Martin 2003; Jones, 2004: 107). The “gene fetishism” that Donna Haraway (2000, p. 94) once spoke of is then a form of fallacy of misplaced concreteness, a reductionist idea locating both the essence and the potentiality of the organisms exclusively to the gene structure (Keller, 2000; Haraway, 1997). The organism is not once and for all fixed but is what is capable of changing and responding to the environment; it is a metastable transductive unity.

To return to organization theory and theories of organization, Schatzki (2002, 2006) and Czarniawska’s (1997, 2004) theories of organization are two examples of what Simondon calls individuation. Practice/arrangement assemblages and action nets are what are not possible to reduce to its components but what is merely a series of resources brought together into functional units. In accordance with Simondon’s thinking, organization here is not a thing, an entity, or ready-made idea, but is merely the purposeful bringing together of various resources in order to accomplish “solid effects”. Contrary to common sense thinking, mainstream treatments, and lexical or textbook definitions, there is no such things as organizations as immutable and ready-made arrangements, but only processes of organizing. Both Schatzki (2002, 2006) and Czarniawska (1997, 2004), to use a Simondonian vocabulary, point at the “pre-individual” features of organization. Organization is a bundle of humans and non-humans, ideas and beliefs. Out of such “pre-individuated” resources, practice/arrangement assemblages and action nets are constituted. Organization is individuated and becomes metastable. Once such organizing activities become metastable they are capable of being perpetuated and maintained over time and are actually capable of surviving the shock of environmental changes or the displacement of individuals or routines. A company may change its computer system, appoint a new CEO, or implement additional routines without

perishing; it is sufficiently stabilized to handle equally predictable and unanticipated events and occurrences. Nevertheless, there is no mode of organizing that is once and for all accomplished. Mechanisms of transductions are wielding a continuous influence on the organizing and changes occur from time to time. Thinking of organizing as a transductive process means to abandon the binary or dual epistemology that Heidegger and Derrida under different labels referred to as the metaphysics of presence. At the same time, it also promotes an epistemology that is capable of bridging structure and agency, stability and change in both the analysis of organization and technology. Simondon's work is an original and valuable contribution to organization theory and social theory in terms of promoting a process thinking that is first empirically grounded—Simondon's work is filled with examples of how crystals, larvae, and organisms are developing and capable co-existing with its environment—yet providing a vocabulary flexible enough to operate in many empirical settings. Finally, Simondon's work is anchored in a biophilosophy tradition of thinking that to date is only modestly explored in the social sciences but that is providing a set of analytical tools potentially powerful for analyses of social and organizational events and activities.

Concluding remarks

Biophilosophy is a domain of thinking that recognizes the insistence on non-linearity and fluidity in the recent complexity theory literature and provides a conceptual framework that captures the movement and becoming of the contemporary society, yet is capable of providing useful empirical examples to render such theoretical arguments intelligible. The problem with

concepts such as complexity theory is that they are intriguing and potentially useful but regularly are all too abstract to apply to individual cases, at least in the domain of organization theory and management studies. Complexity theory may inform analyses of aggregated phenomena but is complicated to apply to individual organizations, units, departments or work groups. Biophilosophy, on the other hand, starts with the individual organism or a part of the organism and moves to larger assemblies of organisms. In addition, biophilosophical thinking is carefully attending to the differences between organism and its environment. In the present study, it is argued that the work of French philosopher Gilbert Simondon is useful in the field of organization theory. Simondon's work is not very much explored in the social sciences or in the English-speaking community and unfortunately his main works are not even translated into English. However, there are some secondary texts commenting on his work enabling an understanding of his principal ideas. In organization theory there has been an abiding concern to both identify and jointly enact what an organization is and to draw a line of demarcation between organization theory and other disciplines (see e.g., Burrell and Morgan, 1979; Astley, 1985; Pfeffer, 1993; Donaldson, 1998; Van Maanen, 2000; Gabriel, 2001; Starbuck, 2003). In other words, the individuation of the object of study and its accompanying discipline has been a principal concern among business school researchers. Recent contributors such as Schatzki (2002, 2006) and Czarniawska (1997, 2004) argue persuasively that organization is the process of bringing heterogeneous resources into action; organizing is a dynamic and horizontally oriented activity with no innate logic or essence; organizing is what is in a state of becoming. Using Simondon's thinking, organizing is one particular form of individuation, the ontogenesis of a transductive unity that is metastable and therefore capable of generating effects and maintaining its shape. Simondon's theoretical framework is then an ontological and epistemological framework that is potentially useful for examining not only actual organizational configurations but also a metatheoretical tool structuring the

analysis of contributions to formal organization theory. Therefore, the work and thinking of Gilbert Simondon is of great importance for organization theory.

References

- Ansell Pearson, K. (1999), *Geminal Life: The Difference and Repetition of Deleuze*, London: Routledge.
- Armitage, J. (2006), 'From discourse networks to cultural mathematics. An interview with Friedrich Kittler', *Theory, Culture and Society*, 23(7-8): 17-38.
- Astley, W.G. (1985), 'Administrative science as socially constructed truth', *Administrative Science Quarterly*, 30: 497-513.
- Barley, S.R., (1986), 'Technology as an occasion of structuring: Evidence from observations of CT scanners and the social order of radiology departments', *Administrative Science Quarterly*, 31: 78-108.
- Barley, S.R. (1990), 'The alignment of technology and structure through roles and networks', *Administrative Science Quarterly*, 35: 61-103.
- Beistegui, M. de. (2005), 'From Merleau-Ponty's "Reduction" to Simondon's "Transduction" ', *Angelaki: Journal of Theoretical Humanities*, 10(3): 109-122.
- Bijker, W.E., (1995), *Of Bicycles, Bakelites, and Bulbs: Toward a Theory of Sociotechnical Change*, Cambridge & London: The MIT Press.
- Braidotti, R., (2006); *Transpositions: On Nomadic Ethics*, Cambridge & Malden: Polity Press
- Burrell, G. and Morgan, G., (1979), *Sociological Paradigms and Organisational Analysis*, Gower, Aldershot.
- Burwick, F. and Douglass, P. (eds.), (1992), *The Crisis in Modernism: Bergson and the Vitalist Controversy*, Cambridge. Cambridge University Press.
- Canguilhem, Georges, (1992), 'Machine and Organism', in Crary, Jonathan & Kwinter, Sanford, eds., (1992), *Incorporations*. New York: Zone Books, pp. 45-69.
- Chabot, P. (2005), 'The philosophical August 4th: Simondon as a Reader of Bergson', *Angelaki: Journal of Theoretical Humanities*, 10(3): 103-108.
- Czarniawska, B. (1997), *Narrating the Organization: Dramas of Institutional Identity*, Chicago & London: The University of Chicago Press.
- Czarniawska, B. (2004), 'On space, time, and action nets', *Organization*, 11(6): 773-791.
- DeLanda, M. (1992), 'Nonorganic Life', in Crary, Jonathan & Kwinter, Sanford, eds., (1992), *Incorporations*. New York: Zone Books, pp. 129-167.
- De Landa, M. (2002), *Intensive Science and Virtual Philosophy*, London & New York: Continuum.
- Deleuze, G. and Guattari, F., (1988), *A Thousand Plateaus Capitalism and Schizophrenia*, University of Minnesota Press, Minneapolis.
- Dodge, M. and Kitchin, R., (2005), 'Code and the transduction of space', *Annals of the American Geographers*, 95(1): 162-180.
- Donaldson, L. (1998), 'The myth of incommensurability in management studies: Comments by an integrationist', *Organization*, 5(2): 267-272.
- Dumochel, P. (1995), 'Gilbert Simondon's plea for a philosophy of technology', in Feenberg, A. and Hannay, A., eds., (1995), *The Politics of Knowledge*, Bloomington & Indianapolis: Indiana University Press, pp. 255-271.
- Fraser, M., Kember, S. and Lury, C., (2005), 'Inventive life. Approaches to a new vitalism', *Theory, Culture & Society*, 22(1): 1-14.
- Gabriel, Y., (2001), 'The state of critique in organizational theory', *Human Relations*, 54(1): 23-30.

- Grosz, E., (2004), *The Nick of Time: Politics, Evolution and the Untimely*, Durham: Duke University press.
- Hedgecoe, A. and Martin, P. (2003), 'The drug don't work: Expectations and the shaping of pharmacogenetics', *Social Studies of Science*, 33(3): 327-364.
- Hansen, M.B.N. (2006), *Bodies in Code: Interfaces with Digital Media*, Cambridge & London: The MIT Press.
- Haraway, D. (1997) *Modest=Witness@Second=Millenium. FemaleMan©=Meets=OncoMouse™*, London: Routledge.
- Haraway, D.J. (2000), *How Like a Leaf: An Interview with Thyrza Nichols Goodeve*, New York & London: Routledge.
- Hayles, N. K. (1999), *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*, Chicago & London: The University of Chicago Press.
- Holland, J.H., (1998), *Emergence: From chaos to order*, Oxford: Oxford University Press
- Jones, R.A.I., (2004), *Soft Machines: Nanotechnology and Life*, Oxford & New York: Oxford University Press.
- Keller, E.F., (2000), *The Century of the Gene*, Cambridge & London: Harvard University Press.
- Lash, S. (2006), 'Life (Vitalism), *Theory, Culture & Society*, 23(2-3): 323-329.
- Lenoir, T., (1998), 'Inscription practices and materialities of communication', in Lenoir, T., ed., (1999), *Inscribing Science: Scientific Texts and the Materiality of Communication*, Stanford: Stanford University Press. pp. 1-19.
- Lenoir, T. (2004), 'Foreword', in Hansen, Mark B. N. (2004), *New philosophy for new media*, Cambridge & London: The MIT Press.
- Lindberg, K. and Czarniawska, B. (2006), 'Knotting the action net, organizing between organizations', *Scandinavian Journal of Management*, 22: 292-306.
- Mackenzie, A. (2002), *Transductions: Bodies and Machines at Speed*, London & New York: Continuum.
- Maturana, H.R. and Varela, F.J. (1980), *Autopoiesis and Cognition: The Realization of the Living*, Dordrecht, Boston and London: D. Riedle Publishing.
- Nowotny, H. (2005), 'The Increased Complexity and Its Reduction. Emergent Interfaces Between the Natural Sciences, Humanities and Social Sciences', *Theory, Culture & Society*, 22(5): 15-31.
- Orlikowski, W.J. (1992), 'The duality of technology: Rethinking the concept of technology in organizations', *Organization Science*, 3(3): 398-427.
- Orlikowski, W.J. (2000), 'Using technology and constituting structures: A practice lens for studying technology in organizations', *Organization Science*, 11(4): 404-428.
- Pfeffer, J. (1993), 'Barriers to the advance of organizational science: Paradigm development as a dependent variable', *Academy of Management Review*, 18(4): 599-620.
- Prigogine, I. and Stengers, I., (1984), *Order Out of Chaos: Man's New Dialogue With Nature*, Bantam Books, New York.
- Schatzki, T.R. (2002), *The Site of the Social: A Philosophical Account of the Constitution of Social Life and Change*, University Park. The Pennsylvania State University Press.
- Schatzki, T.R. (2006), 'On organizations as they happen', *Organization Studies*, 27(12): 1863-1873.
- Shaviro, S. (2007), 'Simondon on individuation', Text posted in the internet, Available at <http://www.shaviro.com/Blog/?p=471> (Accessed January 30, 2007)
- Schmidgen, H. (2004), 'Thinking technological and biological beings: Gilbert Simondon's philosophy of machines', Manuscript presented at 4S-EASST, Annual Meeting, Paris, August 28, 2004, Available at: http://www.csi.ensmp.fr/WebCSI/4S/download_paper/download_paper.php?paper=schmidgen.pdf, (Accessed February 7, 2007)
- Simondon, G. (1958/1980), *On the Mode of Existence of Technical Objects*, Trans. by N. Mallahphy, London: University of Western Ontario.
- Simondon, G. (1964/1992), 'The Genesis of the Individual', in Cray, Jonathan & Kwinter, Sanford, eds., (1992), *Incorporations*. New York: Zone Books, pp.297-319.
- Starbuck, W.H. (2003), 'Shouldn't organization theory emerge from adolescence?', *Organization*, 10(3): 439-452.

- Stiegler, B. (1998), *Technics and Time, 1: The Fault of Epimetheus*, Trans. by R. Beardsworth & G. Collins, Stanford: Stanford University Press.
- Tsoukas, H. (2005), *Complex Knowledge: Studies in Organizational Epistemology*, Oxford & New York: Oxford University Press.
- Van Maanen, J.(2000), 'Fear and Loathing in Organization Studies', in Frost, P.J., Lewin, A.Y. & Daft, R.L., Eds., (2000), *Talking About Organization Science: Debates and Dialogues from Crossroads*, Thousand Oaks: Sage.
- Weick, K.E., (1969/1979), *The Social Psychology of Organizing*, 2nd ed., New York: McGraw-Hill.
- Wiener, N. (1948), *Cybernetics, or control and communication in the animal machine*, New York: John Wiley.
- Wiklund, R.A., (. 1960), 'A short Introduction to the neofinalist Philosophy of Raymond Ruyer', *Philosophy and Phenomenological Research*, 21(2): 187-198